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VARIABILITY IN RESPONSE TO DRUGS

CHAIRMAN'S ADDRESS

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NEW ORLEANS

It is my intent in this paper briefly to call attention to a type of observation which has come to be commonplace to the pharmacologist but which is perhaps not brought so forcefully to the attention of those whose interest is therapeutics rather than pharmacology. This is the matter of the variability in response to drugs. I do not mean to infer that the physician does not recognize that patients do vary in this respect. Indeed, one of the factors in the successful treatment of disease is the physician's ability to recognize and to correct for such deviations from expected behavior. It is to be emphasized, however, that variability—individual variation—is not a perverse disturbance but is rather the condition to be anticipated. It represents, in fact, the normal—the expected situation—if the observations of the pharmacologist in the laboratory have any validity.

The direction that pharmacology has taken in recent years has forced the pharmacologist to a recognition and consideration of this matter. Much of the earlier work was essentially descriptive—morphologic, if the analogy may be permitted. Interest was chiefly in the qualitative properties of drugs rather than in their quantitative differences. But in the search for new therapeutic agents, in the collaboration between the organic chemist and the pharmacologist, it became necessary to develop methods of comparison as well as of contrast. Moreover, there came about a growing appreciation of the necessity of an accurate standardization of drugs. These and other factors have contributed to the development of quantitative methods in pharmacology.

In the comparison of a series of new synthetic products it is important to know the relative toxicity of the different members, since obviously toxicity may be the limiting factor in the use of a drug. The measure of toxicity that is most easily determined, the one that has the clearest end point, is the ability to kill. There is thus found in the literature, even up to the present day, a determination for drugs which is called the M. L. D. (minimum lethal dose). This figure is obtained by injecting a series of increasing doses into a series of animals until a dose is found that kills. Usually the groups have been small and there has been

little or no effort at determining how many animals would survive this dose. The minimum lethal doses so determined probably did have some value because they did serve as a means of relating roughly therapeutic activity to toxicity. Today, however, it has become clear to the pharmacologist that this expression in the sense originally used is not exact either for animals or for man. In the light of present day information the acceptable expression is the L. D. 50, the dose that can be expected to kill 50 per cent of a considerable group of animals. The derivation of this expression will be discussed later.

There are in use today two simple methods of determining the toxicity of a substance when its ability to kill is used as the end point. One of these is that used in the well known assay of digitalis in terms of "cat units." A well diluted solution of the active material is slowly injected intravenously into cats until death by digitalis poisoning of the heart occurs. The dose required to kill each individual cat is then expressed in terms of amount per unit weight. Most cardiologists seem to believe that this figure is, or should be, about 0.1 Gm. of digitalis per kilogram of cat. Actually any individual animal may be killed by an amount which is much smaller than this, or it may require a considerably greater amount. In the case of cats, for example, de Lind van Wijngaarden¹ in the laboratory of Magnus has shown that some cats require more than two and one half times the dose required for others. Here obviously the expression minimum lethal dose has no meaning except for the cat on which the determination was made. However, if a large number of such lethal doses are determined, while they differ over a wide range, the mean lethal dose (the average for the group) is the one that occurs most frequently, and the ones that differ most from the mean occur least often, the distribution being relatively symmetrical. The frequency polygon drawn from this distribution is of course also correspondingly symmetrical (chart 1).

There is another graphic expression of such results; that is, by integrating the values given in the frequency polygon. In this method the mortality in the group is plotted on the ordinate, and dosage required to kill on the abscissa. Since any animal that died from a small dose would certainly have been killed by larger doses, any point on the plotted curve is made to include the mortality not only for that dose but for all animals in the groups killed by smaller doses. The resultant curve is the well known sigmoid or S shaped curve (chart 2) familiar to all pharmacologists. It is merely the graphic expression of the variability in response. However, its significance can be seen if one recognizes that any particular point on the curve can be considered to represent

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Read before the Section on Pharmacology and Therapeutics at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Lind van Wijngaarden, C. de: Untersuchungen über die Wirkungsstärke von Digitalispräparate, Arch. f. exper. Path. u. Pharmacol. 113: 40, 1926.

the expected mortality if all the members of a series were injected with the dosage corresponding to that particular point on the abscissa. Experimentally it has been found that the predicted results are most nearly obtained for the middle part of the curve. Today the accepted expression for toxicity is the L. D. 50; that is, the dose that will kill 50 per cent of a group of animals

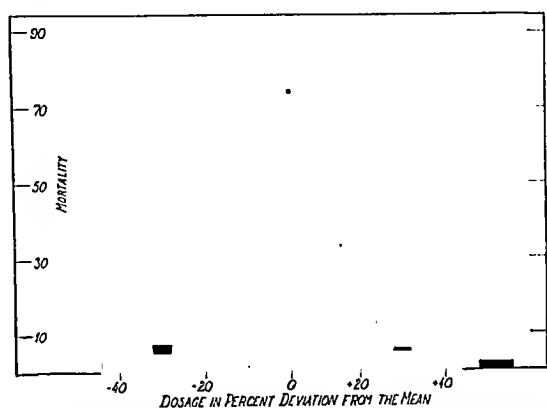


Chart 1.—Frequency polygon showing the distribution around the mean value of the lethal doses of digitalis for different cats. Numbers of cats are shown on the ordinates; on the abscissa 0 represents the mean value, with deviations from this shown as percentages plus and minus (after de Lind van Wijngaarden¹).

sufficiently large. One may interject parenthetically that when digitalis is examined in this fashion it is necessary to standardize the anesthetic, the rate of injection, possibly the dilution, and other factors. The "cat unit" in the sense often used today varies not only because of variations in potency of digitalis but also because of variations in pharmacologists. Therefore, as an expression of an absolute value it is of somewhat restricted significance except in the laboratory where it has been determined.

The second method of determining toxicity by use of the fatal dose determination is one in which the individual dose for each animal is not determined. In the application of this method, groups of animals as comparable as possible as to weight, sex, state of nutrition and other factors are used. For obvious reasons small animals, frogs, mice, rats, insects and goldfish, are commonly employed. Into all the members of several such groups are injected doses of increasing amounts, each member of a particular group however getting the dose previously decided on for that group. If the old conception of the minimum lethal dose were correct, all of the groups below a certain dose level would survive, all above that point would be killed. This is not the case, as has been shown many times with many different substances. For example, in a study of the toxicity of strychnine salicylate for male rats from 6 to 8 months old it was found that 1.5 mg. per kilogram killed less than 10 per cent of a group, 2 mg. per kilogram about 30 per cent and 3 mg. per kilogram more than 90 per cent.² Obviously there is a variation in susceptibility, and when the data are plotted in the same fashion as indicated for digitalis with the percentage killed on the ordinate against the dosage on the abscissa, the same type of S shaped curve is obtained. In the particular study from which these data are taken, quite different values were reported for animals of the opposite sex and for different ages. Females were found more susceptible than males, and the toxicity decreased with age.

2. Poe, C. F.; Suchy, J. F., and Witt, N. F.: Toxicity of Strychnine for Male and Female Rats of Different Ages, *J. Pharmacol. & Exper. Therap.* 58: 239 (Nov.) 1936.

These curves, which after all are only the graphic expression of the variability of response of animals to these particular toxic substances, are not unique. Similar curves can be plotted for the actions of a variety of drugs in which the end point is definite enough to be clearly recognized. There may be less symmetry than is here shown; the curves may rise more rapidly or be more flattened, but in a general way it may be said that the variability that underlies the records is a biologic phenomenon; it is the behavior that one has come to expect.

What is the concern of the physician with such experiments—with curves that are derived often from toxic actions? Often, it is true, he is unaware of such variability because of the difficulty in recognizing degrees of effect, of establishing comparable levels of action. In other cases, in the induction of anesthesia for example, variability is recognized but correction is at once made for it. The anesthetist modifies the concentration or the respiratory activity until the desired end point is reached.

A number of years ago Hanzlik³ gave salicylates to a large group of patients to the point of induction of symptoms of intolerance. When his data are arranged in the fashion indicated for the toxicity of digitalis for cats, the sigmoid curve results. Clark,⁴ in an address to members of the British Medical Association on this same subject of variability in response, cites other studies, for example of the amount of sodium amylal

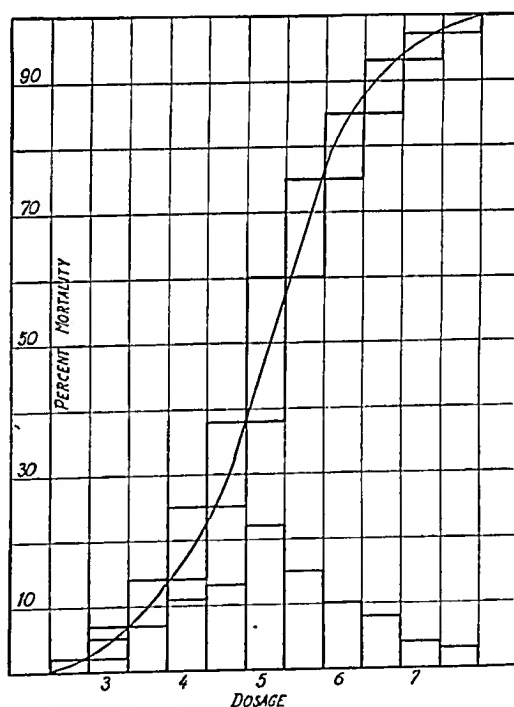


Chart 2.—Frequency distribution of individual lethal doses (frequency polygon, below) and the cumulative or integrated frequency of the same doses (above). The smooth curve drawn through the upper blocks is the S shaped or sigmoid curve mentioned in the text. On this curve, the L. D. 50 would correspond to 5 dosage units. This is an idealized experiment.

required to produce analgesia for labor and of evipal soluble for anesthesia, which yield similar curves. The lethal doses of diethylene glycol for human beings, as

3. Hanzlik, P. J.: A Study of the Toxicity of the Salicylates Based on Clinical Statistics, *J. A. M. A.* 60: 957 (March 29) 1913.
4. Clark, A. J.: Individual Variation in Response to Drugs, *Brit. M. J.* 2: 307 (Aug. 14) 1937.

compiled by Calvery and Klumpp,⁵ have a similar distribution. When their data are published there will be available for the first time an L. D. 50 for the human species, or at least a value approaching it. A moment's consideration will reveal why the present lethal doses for man of different poisons given in toxicologies differ so much. They merely represent the results on a few of the members of the group that must be used to give anything approaching an exact value. Put differently, they are definite evidence of the variability that forms the subject of this report.

Recently the extensive use of metrazol for the production of convulsions in human beings has made possible compilation of data. Hitchcock⁶ in my laboratory has shown that the doses required have the typical distribution and yield the sigmoid curve. Further examples need not be given. It is evident from those cited that the variability found by the pharmacologist working in the laboratory with populations as uniform as possible as to sex, weight and nutrition is to be anticipated in the human species. As a matter of fact the lack of uniformity in human populations with respect to age, weight, sex and physical health would lead one to expect an even greater degree of variability. Not a great deal of exact knowledge exists as to the effect of these factors. It has been clearly shown that there are sex differences, as for example in the case of strychnine. Some years ago McGrath showed that it was much easier to produce gangrene of the tail in male rats than in females by the use of large doses of ergotamine. He further noted that injection of theelin protected the otherwise susceptible males.⁷ When differences in age are considered, even the simplest determinations are complicated by variations in weight as well. In the laboratory, dosage is commonly calculated on a weight basis, but evidence for the correctness of this practice is largely wanting. Indeed the studies on metabolism on both laboratory animals and man indicate that, for this particular determination, corrections are more properly made in relation to surface area, which is not a function of weight.

Finally, when one faces the variability introduced by the presence of disease, quantitative studies are almost wholly lacking. There is here an almost unexplored field of pharmacology, which is surprising in view of the immediate significance of the results to therapeutics.

In all this discussion there has been presented nothing that is new. Every physician is aware of course that there exists the type and degree of variation that has been described. Yet there are implications that are not recognized, if one may judge by the questions that come to the pharmacologist from his clinical colleagues. For example, the spread of response described means that any fixed dose system of anesthesia is unsound. If a series is large enough there will inevitably be a number of dangerous or even fatal reactions from what are ordinarily considered safe doses. If normal cats vary as has been described in their susceptibility to digitalis, it is certain that in the administration of massive doses of digitalis for prompt action there will be instances of patients representing the lower part of the curve, poisoned by amounts of digitalis not dangerous to the greater number of patients. If alcoholic intoxication is diagnosed on the basis of blood alcohol alone, some drivers will be charged with a degree of intoxication

that is either greater or less than their degree of motor control justifies. If local anesthetics are injected for surgical operations, an occasional patient will show alarming reactions.

Because one must recognize that variation is a biologic fact, one should not therefore fold one's hands and accept the situation without an attempt at clarification. Even variability must have an explanation. But if the experience of those who work with populations rather than with individuals, under more rigorously controlled conditions than are usually possible in the practice of medicine, can at all be translated into the clinical field, then occasional untoward reactions which are not due to idiosyncrasy or thymicolymphatic constitution or air emboli or improperly prepared solutions are to be anticipated.

CONCLUSION

It is urged that, when the practicing physician is working with material that could be treated by the pharmacologist to gain further insight into the degree and extent of human variability, he should report his data in detail. When more knowledge is available, when the pharmacologist can with some assurance predict the safe ranges in human pharmacology, then perhaps he can at the same time add something to the safety and effectiveness of human therapeutics, which after all is one of his chief reasons for existence.

THE HAZARDS OF FARMING

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COOPERSTOWN, N. Y.

During the past quarter century the hazards of industry, transportation, mining and construction have been recognized; the economic value of safety has become clearly apparent and measures have been adopted to insure its promotion. For agriculture, because of its primarily individualistic character, there has been no such recognition or supervision, and farming, though the oldest occupation in the world, remains the most hazardous.

Having lived and practiced surgery in a rural community during the past eight years, I have become interested in the hazards to which the farmer is daily exposed and the accidents which result therefrom. In central New York, small dairy farms are numerous and farming is often an occupation of necessity rather than choice. Many of the farmers are poor, their equipment is inadequate and frequently out of repair, wages are low and hired help is difficult to find and often incompetent. Because of these circumstances, carelessness and inefficiency are common and serious accidents are prone to occur.

This report is based on a review of 310 accidents of this type sustained in a rural section of New York State. The patients were treated at the Mary Imogene Bassett Hospital in Cooperstown, N. Y., during the years 1929-1938 inclusive.

An analysis of the records has disclosed numerous interesting facts relative to farm injuries which seem pertinent for presentation to the Section on Preventive and Industrial Medicine and Public Health. The only other data on agricultural accidents of which I am aware have been collected by the Kansas board of health from

5. Calvery, H. O., and Klumpp, Theodore: Personal communication to the author.

6. Hitchcock, W. P.: Personal communication to the author.

7. McGrath, E. J. G.: Experimental Peripheral Gangrene; Effect of Estrogenic Substance and Its Relation to Thrombo-Angiitis Obliterans, Arch. Int. Med. 55: 942 (June) 1935.

From the Department of Surgery of the Mary Imogene Bassett Hospital.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

fatal farm accidents in that state. The statistics herein reported have been compiled from accidents of sufficient severity to necessitate admission of the patient to the hospital or to require major surgical treatment in the operating room.

ANALYSIS OF 310 FARM ACCIDENTS

1. *Incidence, Liability and Seasonal Distribution.*—Many seemingly irrelevant conditions have a direct influence on the admission of patients to hospitals. The

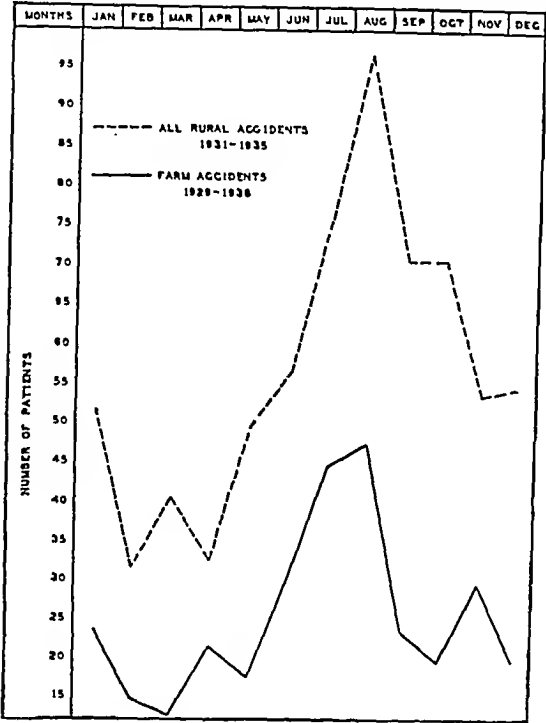


Chart 1.—Seasonal distribution of farm accidents compared with all rural accidents.

economic status of the family, the season of the year, the condition of the roads, the distance to be traversed, the severity of the injury, and the attitude of both the family and the physician all exercise a selective effect on statistics of hospital morbidity in a rural area. Hence

TABLE 1.—Etiologic Analysis of 310 Farm Accidents

Activity	Number	Per Cent
Chores	99	31.9
Logging	66	21.3
Haying	50	16.1
Playing of children	31	10.0
Repair and construction of buildings	22	7.1
Assault or suicide	13	4.2
Others	29	9.4
Total	310	100.0

any discussion of the incidence of farm accidents in a given district on this basis is open to some criticism. With this in mind a simple statement anent the incidence of serious farm injuries in this locality, treated at this hospital, will suffice. During the decade embraced by this study there were 1,329 patients with injuries of comparable severity from all types of trauma; 310 of these, or 23.3 per cent, were related to the hazards of farming.

Of the farm accidents 70.3 per cent were due to carelessness of the person injured and 9.4 per cent to the carelessness of some one else, 15.5 per cent were unpre-

dictable, 4.2 per cent were intentional and in 0.6 per cent the liability for the accident could not be definitely allocated.

Summer is the most dangerous season on the farm; late winter, the most secure. The curve representing the seasonal distribution of all farm accidents (chart 1) is comparable to that for all rural accidents reported at the Conference on Rural Medicine in Cooperstown in 1938.¹ Accidents in the course of routine chores are more or less constant throughout the twelve months; those due to logging occur most frequently during the late fall and winter, while those incidental to haying are naturally much more numerous during July and August (chart 2). The summer peak is composed largely of haying accidents and accidents due to unclassified activities, including the playing of children.

2. *Location.*—Exactly one half of these 310 farm accidents occurred in the barn or barnyard, 13.5 per cent in the woods, 12.6 per cent in the surrounding

TABLE 2.—Etiologic Agents in 310 Farm Accidents

Agent	Number	Per Cent
Tool or implement	56	18.1
Animal	51	16.5
Machine	40	12.9
Vehicle	36	11.6
Falling tree	17	5.5
Heat or Cold	7	2.2
Others or none	103	33.2
Total	310	100.0

fields and pastures, 8.4 per cent in the hayfield and only 6.8 per cent in the house and shed. A few occurred on the highway but were not due to motor vehicles.

3. *Etiology.*—At least two factors participate in the causation of most farm accidents, a motivating activity and a causative agent. Of the former, routine chores accounted for nearly one third of the accidents, logging for one fifth and haying for one sixth (table 1). Ten per cent of the accidents were sustained by children

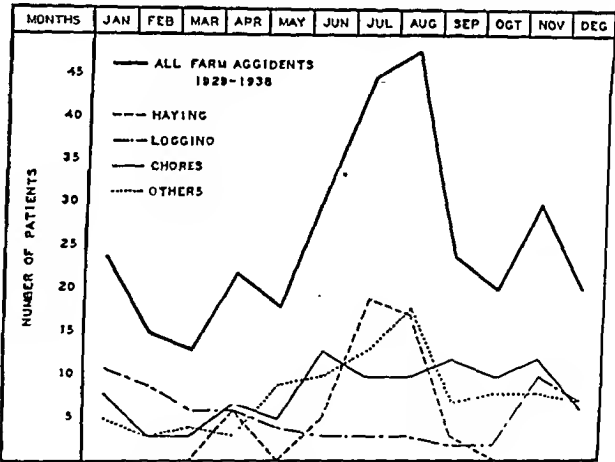


Chart 2.—Curves representing the seasonal variation of farm accidents and their common motivating activities.

while at play on buildings or vehicles, in trees or near men at work with machinery. Assault or suicide was responsible for 4.2 per cent of the injuries, a rather unexpected hazard but one which may be explained by the lonely life of poverty and solitude which many farmers lead in distinctly rural areas.

1. Powers, John H.: Rural Medicine: Emergency Surgery in a Rural Hospital, Springfield, Ill., Charles C. Thomas, 1939, p. 51.

The etiologic agents are recorded in order of frequency in table 2. Eighteen per cent of the accidents were caused by farm tools or implements, 16.5 per cent by animals, 12.9 per cent by machinery, 11.6 per cent by vehicles, 5.5 per cent by falling trees or rolling logs and 2.2 per cent by heat or cold. Under "others" are included barbed wire fences, rusty nails, splinters, thorns, hooks, chains and firearms. When a fall occurred with no obvious causative agent responsible, none was recorded; the numerous falls on slippery, icy ground account for the high percentage of accidents included in this category.

4. *Distribution by Age and Sex.*—In central New York state all rural accidents were found to be most common between the ages of 15 and 24; males were injured twice as frequently as females.¹ Farm accidents show no such definite peak but occur with little significant variation from the beginning of the second decade throughout the active working life of man. Males are involved with ten times the frequency of females (chart 3).

5. *Analysis of Interval Between Accident and Admission.*—One phase of this study has been of particular interest, namely the disclosure of the length of time required for injured farmers in the surrounding country-

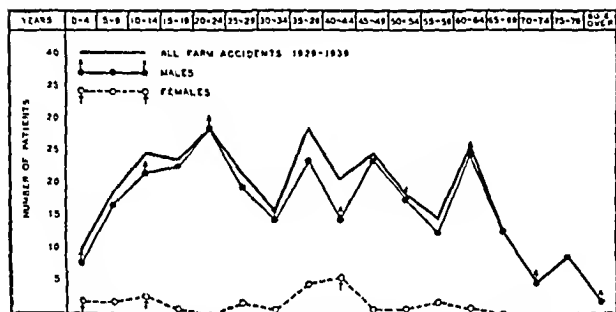


Chart 3.—Distribution of farm accidents by age and sex.

side to reach the hospital after an accident has occurred. The data are presented in chart 4; 30 per cent of the patients arrived within one hour, 46 per cent within two hours, 56 per cent within four hours and 63 per cent within six hours. The percentages for subsequent intervals up to one week are tabulated in the chart.

6. *Classification of Injuries and Topographic Distribution of Injuries and Fractures.*—There were 289 fractures, of which eighty-five were compound, comprising 33.7 per cent of the 864 recorded injuries, classified according to the second edition of the Standard Classified Nomenclature of Disease. Lacerations were next in frequency. Division of nerves, blood vessels and tendons and partial or complete amputations of fingers, hands or forearms are common among farm injuries and are due to contact with rotary saws, mowing machines, ensilage cutters, scythes and axes. Eleven per cent of the patients sustained concussion of the brain, and approximately 6 per cent were in shock on arrival at the hospital. Many patients received multiple lesions of bones and soft tissues in combination. All the injuries are classified by number and percentage in chart 5.

Actually of more interest in a study of the hazards of farming is the topographic distribution of the injuries and fractures thereby sustained. These are presented in chart 6, which shows that, although the shoulder and upper extremity were injured much more often (in approximately 30 per cent of the cases) than the

hip and lower extremity, the bones of these parts were fractured with almost equal frequency.

7. *Period of Hospitalization.*—As a result of these farm accidents 4,855 days were spent in the hospital by 266 inpatients and 1,333 visits were made to the ambulatory surgical clinic by 232 outpatients (chart 7).

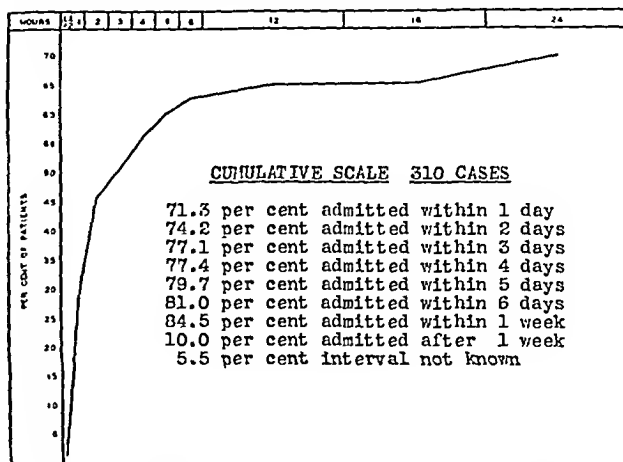


Chart 4.—Analysis of interval between accident and admission.

These figures represent both time which the farmer can ill afford to lose and money which he can even less well afford to pay for hired help. The average period of hospitalization was 18.3 days and the average number of outpatient visits was 5.7, yet neither figure is an accurate representation of the total period of disability.

8. *Fiscal Analysis.*—The actual cost of a serious injury is to most farmers a major financial catastrophe.

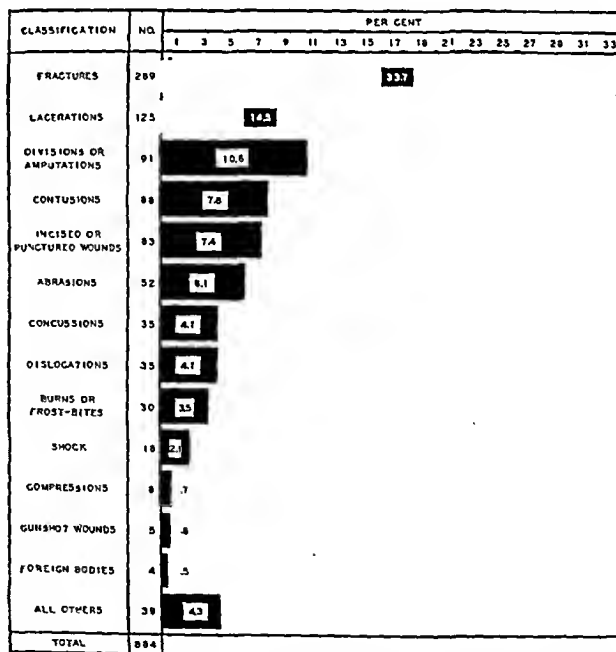


Chart 5.—Classification of 864 injuries sustained in 310 farm accidents.

Twenty per cent in this series were able to pay nothing for their professional care and hospitalization, 18 per cent paid in part and 62 per cent paid in full. Most of the last mentioned required many months and even years for the complete discharge of their financial obligation. The hospital was forced to accept a financial

loss of about \$10,000, or 30 per cent of the total charges made for hospitalization, outpatient visits and professional care incidental to the hazards of farming.

9. *Analysis of Fatalities.*—Sixteen of the patients did not survive. Three were moribund on admission and died from the immediate effects of trauma within a few hours. Three lived less than one day, and five survived from two to four days. The remaining five died from

TABLE 3.—Analysis of Fatalities

Cause of Death	No.	Contributing Activity	No.	Contributing Agent	No.
Fracture-dislocation of cervical spine.....	4	Chores	5	Animal	3
Compound depressed fracture of skull...	3	Logging	4	Heat (fire)	3
Extensive burns.....	3	Haying	3	Vehicle	2
Multiple injuries and shock	2	Playing of children	2	Falling tree	2
Tetanus	1	Repair of buildings	1	Machine	1
Peritonitis	1	Suicide	1	Firearm	1
Bacteremia due to Staphylococcus aureus	1				
Coronary thrombosis..	1			Others or none...	4
Total	16	Total	16	Total	16

Mortality, 5.1 per cent

ten to fifty-three days after admission because of complications associated with the late effects of trauma or from intercurrent disease. Fourteen of the deaths were of adults, with an average age of 55 years, and two were of children.

The contributing activities and agents are given in order of frequency in table 3. The mortality for the entire group of 310 patients was 5.1 per cent.

SUMMARY

Agricultural accidents were responsible for nearly one fourth of all the serious injuries treated at a medium sized rural hospital in the central part of New York

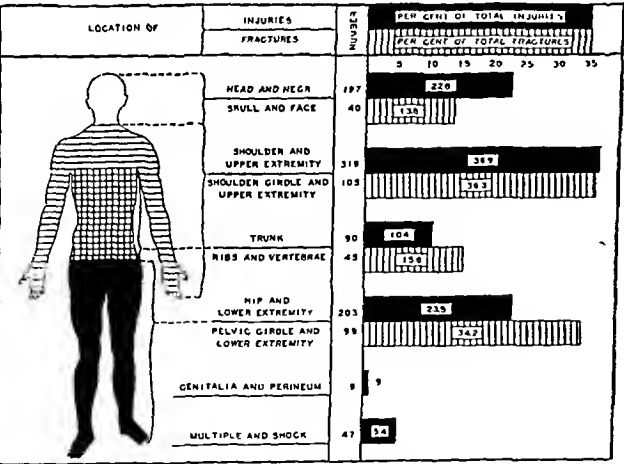


Chart 6.—Topographic distribution of injuries and fractures due to the hazards of farming. All injuries of each anatomic subdivision are recorded above the horizontal line and in the black columns; all fractures of the bones of the same subdivision are recorded below this line and in the shaded columns.

State during the years 1929-1938 inclusive. Such accidents showed a definite seasonal variation with a peak during July and August, for which haying, the playing of children and other unclassified activities were largely responsible.

Fifty per cent of all farm accidents occurred either in the barn or in the barnyard.

Routine chores were the most dangerous single motivating activity, with logging and haying next in order of frequency. Farm tools and implements, animals, machinery and vehicles all contributed their share of injuries in about equal proportions. Falls were numerous.

Males were involved with ten times the frequency of females.

Nearly 50 per cent of the patients reached the hospital within two hours.

Fractures comprised one third of all injuries; division of nerves and tendons and partial or complete amputa-

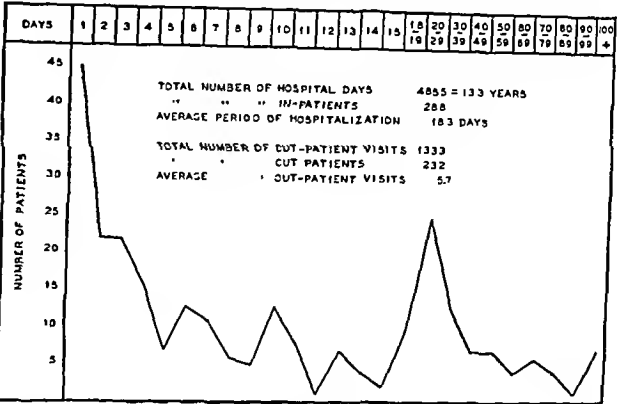


Chart 7.—Data relative to period of hospitalization and number of outpatient visits.

tions of fingers and hands were common. The shoulder and upper extremity were injured more frequently than the hip and lower extremity.

The average period of hospitalization was 18.3 days and the average number of outpatient visits was 5.7.

The monetary loss incidental to a serious injury was for most farmers a major financial catastrophe. Twenty per cent were unable to pay anything for their hospitalization and professional care.

The mortality was 5.1 per cent.

CONCLUSION

Farming is an exceedingly dangerous occupation, the hazards of which are not universally appreciated.

ABSTRACT OF DISCUSSION

DR. FRED P. HELM, Topeka, Kan.: It is fitting that a physician devoted to the conservation of human life has made this study. Farming is the occupation in which more accidents occur than in any other line of industry, and it is the occupation in which the least accident prevention effort has been made. Education is the chief weapon by which we may combat farm accidents, and a study of the causes is essential as the basis of a safety program. The causes of farm accidents, as stated by Dr. Powers, include machinery, animals, vehicles and falls. These causes tally with the experience of the Kansas State Board of Health. There is some variation in Dr. Powers' analysis, as compared to the data assembled in our office, which may be accounted for by the fact that (1) Dr. Powers' study includes nonfatal as well as fatal injuries, whereas our figures deal only with fatal accidents; (2) Dr. Powers has included all persons dwelling on the farm, whereas the health department classification includes only those engaged in agriculture; (3) Dr. Powers has included under "farm" accidents injuries which, in our records, fall under four classifications, namely "home," "motor vehicle," "public" and "occupational," and (4) homicidal or suicidal injuries are not classified as accidental by vital statistics bureaus. Obviously, restricting farm injuries to those incurred in agriculture would change the picture as to cause, age and sex. It is characteristic of all accident injuries,

however, that far more occur in males than in females. The reports coincide in that summer is the season of greatest frequency. Deaths due to Kansas farm accidents, by cause, during 1930-1938 inclusive, were machinery 244, animal 171, excessive heat eighty-nine, vehicular eighty-one, falls eighty, lightning forty-three, puncture and incised wounds and abrasions forty-two, injury by falling trees cut for firewood or posts thirty-eight, burns twenty-one, falling objects (other than trees) eight, excessive cold seven, electric shock five and "other" twenty-five, a total of 854. Although the leading cause is machinery, as one would expect in this "mechanized" age, the animal injuries, plus those caused by horse-drawn vehicles, exceed the machinery fatalities. Dr. Powers stated that "70 per cent of farm accidents are due to carelessness." Our reports also prove carelessness to be the leading cause. These accidents therefore are largely preventable.

DR. A. G. CRANCH, New York: Dr. Powers has emphasized certain hazards well worth considering. One is accustomed to overlook the hazards in farming and agriculture. I spent practically five years in a rural community without hospital facilities or improved roads or automobiles, and I have a little different point of view from the men in the hospitals. Such a hazardous situation exists in farming because of the primitive, makeshift tools usually employed for the work on the farm, because of the improper use made of ill adapted tools and because the machinery on the farm is almost completely unguarded. The safety movement as we know it in industry is practically unheard of in farm circles, and you can't tell them; they know! Their fathers did it that way before them, and their grandfathers did it that way even before them, and why should they change their methods? The missionary work I accomplished in five years was practically nil. The accidents went on and from the same sources, because of primitive instruments and unguarded tools. There are two other features in connection with rural hazards. One is the presence of infections, the other infectious diseases. Tuberculosis I found far more prevalent than one would expect in the rural community. Other conditions peculiar to farming, especially around the threshing season, are respiratory infections, fungous infections, allergic conditions and the like. Another thing rather noticeably frequent in rural areas was the presence of psychiatric conditions resulting possibly from isolation and monotony more than anything else. The mental conditions seemed out of proportion to the population.

DR. LEOPOLD BRAHDY, New York: In New York we have long been considering the advisability of extending compensation laws to the farming community and it is only with the data in such papers as we have just heard that one can deal with that question intelligently. There are several things I would like to hear more about. One of them is brought up by the surprisingly small, 2 per cent, number of injuries due to cold. When we have a snowstorm in the city and put thousands of men to shoveling snow, we have scores of serious frostbites, largely because these men are not used to working in the cold. How many of these farm accidents do you estimate occur to the hired help, who are incompetent because they are not used to farm life, and how many occur among the farmers themselves? The effect on the farmer's economic status when he has a serious accident must be given a great deal of consideration from a social and public health point of view, from the standpoint of the individual who is injured, and from the point of view of our own profession. On this important subject there are so little data that this excellent paper marks, I hope, the beginning of a great deal of study along this line.

DR. JOSEPH W. MOUNTIN, Washington, D. C.: The section is deeply indebted to Dr. Powers for this splendid paper. There are at least three reasons why accidents constitute a public health problem: Accidents are a major cause of death and of disability; they are preventable in large part; health agencies are equipped for organizing measures in accident control. Accidents of the type described by Dr. Powers come within the province of health departments. No other agency is so well prepared by reason of its interest and the techniques represented in its staff as an organized county health department for resolving the causative factors associated with farm and home accidents. In the way of specific procedure, I make these suggestions: The health department should endeavor to secure

reports on accidents—those of a minor character as well as the ones that have come to medical attention. The circumstances associated with each accident should be investigated by the health officer, the nurse or the sanitation officer. Moreover, routine inspection of premises may disclose hazards that have not as yet given rise to accidents. Many hazards about the farm could be corrected by rather simple alterations of building and grounds. Improvement in the design of farm machines offers another possibility. Perhaps the largest achievements will come as a result of education. Habits of safety need to be inculcated. Most of all, farmers should be impressed with the fact that they live and work in a dangerous environment. I urge that the health authorities become active workers in the safety movement and most especially in that part of it which is concerned with prevention of farm and home accidents.

DR. J. N. BAKER, Montgomery, Ala.: I too should like to commend Dr. Powers for the lucid and painstaking manner in which he has presented his personal observations and study on the hazards of farming. To an administrative health official of Alabama, which is still predominantly rural, the questions discussed have an added importance. Because of the necessity for concentration in our state on certain major health problems arising from environmental conditions such as malaria, hookworm and pellagra, and which, through an organized health machinery, are being brought under control, the hazards of the farm worker, as contrasted with the industrial worker, have as yet claimed small attention. The educative implications of this study seem clear: agricultural states, under the leadership of their health departments, must seek to bring to their rural population every possible safeguard against hazards, just as our industrial hygiene units are striving to protect the employee in the factory. The "safety first" doctrine, so valuable to industry, must be made to permeate our rural workers. Here is a comparatively new "preventive field" opening up which challenges the resourcefulness alike of physicians and of health workers. Because of the economic factors which figure in the proper medical and hospital care of farm workers after the accident has happened, I should like to have Dr. Powers outline the economic status of this group; that is, how many may have been on relief or were clients of the Farm Security Administration or, through any source whatever, may have had protection through accident or indemnity insurance.

DR. JOHN H. POWERS, Cooperstown, N. Y.: With regard to Dr. Helm's comment about assault and suicide, I appreciate the fact that these are not accidents but, nevertheless, I do regard them as definite hazards of farming in a distinctly rural area and for that reason they were included. Women are involved in agricultural accidents more frequently in central New York State than in Kansas, primarily because of the difference in the type of farming. Where every member of the family must do some form of agricultural labor, carelessness and inefficiency are common; individuals of both sexes and all ages are prone to injury. Dr. Cranch has certainly lived in a rural community. The fact that farming has been done in the same way for generations is undoubtedly responsible for many of these accidents. It is difficult to educate the farmer along progressive lines. Dr. Brahdry's comment regarding the small number of injuries or accidents due to cold can be explained by the fact that the farmer dresses properly for cold weather and the urban citizen does not. With reference to Dr. Mountin's remarks, much, I am happy to say, has been done in a general way regarding the prevention of farm accidents, particularly by two great organizations, the American Red Cross and the National Safety Council. For three years the Red Cross has been interested in this problem and through its local chapters has been directing a program to promote greater safety on the farm and in the home. With regard to Dr. Baker's remarks, I did analyze these statistics from a fiscal standpoint. Sixty per cent of the patients were able to pay in full for their period of hospitalization, professional care and outpatient visits; 20 per cent were able to pay in part, frequently a very small part, and 20 per cent paid nothing. A serious injury is to most farmers a major financial catastrophe; months and even years are required for the complete discharge of the debt thus incurred. Certainly less than 10 per cent of farmers carry accident insurance or any other type of protection, and, even when carried, the amount is usually very small.

THE DELAYED APPEARANCE OF HEART DISEASE AFTER RHEUMATIC FEVER

EDWARD F. BLAND, M.D.

AND

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BOSTON

Involvement of the heart can be recognized in approximately 70 per cent of patients during the course of rheumatic fever in childhood¹ (table 1). It is generally believed that the remaining 30 per cent also have at the same time minimal cardiac damage too slight to be evident by present methods of clinical study. The later appearance during subsequent years of characteristic signs of permanent valvular deformity in a considerable number of the latter group lends support to this conception. This delayed appearance of heart disease is responsible, however, for one of the chief elements of uncertainty with which these patients with so-called potential rheumatic heart disease must contemplate the future. This uncertainty is due in part, we believe, to

TABLE 1.—Incidence of Heart Disease Following Rheumatic Fever

Observer ¹	Total Cases	R. H. D.	P. R. H. D.
Wilson, Lingg and Croxford (New York, 1928).....	416	79.5%	20.5%
Findlay (Glasgow, 1932).....	644	66.4%	33.6%
Kaiser (Rochester, N. Y., 1934).....	1,240	64.0%	36.0%
Ash (Philadelphia, 1936)....	445	66.1%	33.9%
Schlesinger (London, 1938)...	1,000	74.2%	25.8%
Bland and Jones (Boston, 1938).....	1,000	68.6%	31.4%
Average	4,745	70.8%	29.2%

R. H. D.: Demonstrable rheumatic heart disease; P. R. H. D.: Potential rheumatic heart disease.

a lack of information concerning the actual incidence and the extent of this later, and often insidious, crippling of the heart.

Continuity of observation based on the entire life span of a large number of patients with potential rheumatic heart disease in different sections of the country will be necessary for conclusive data. It is evident, however, that studies of such duration lie in large measure outside the scope of contemporary medical experience; nevertheless, we believe that it may be helpful to present at this time certain interval data relevant to this difficult clinical problem.

CLINICAL OBSERVATIONS

The source of our material has been described briefly in previous communications. Since 1920 (a period of nineteen years) approximately 1,700 children and adolescents with rheumatic fever or chorea have received prolonged care and intensive study at the House of the Good Samaritan during an active stage of their disease.

From the House of the Good Samaritan.

The expenses of this study have been defrayed by a grant from the Commonwealth Fund.

Read before the Section on Practice of Medicine at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Wilson, M. G.; Lingg, C., and Croxford, G.: Statistical Studies Bearing on Problems in the Classification of Heart Disease, *Ann. Heart J.* 4: 164 (Dec.) 1928. Findlay, Leonard: Rheumatic Infection in Childhood, New York, William Wood & Co., 1932. Kaiser, A. D.: Factors That Influence Rheumatic Disease in Children, *J. A. M. A.* 103: 886 (Sept. 22) 1934. Ash, Rachel: Prognosis of Rheumatic Infection in Childhood, *Am. J. Dis. Child.* 52: 280 (Aug.) 1936. Schlesinger, Bernard: Public Health Aspect of Heart Disease in Childhood, *Lancet* 1: 593 (March 12) 1938. Bland, E. F., and Jones, T. Duckett: Unpublished observations, 1938.

In the majority it represented the initial attack, and the average age at the time of the original illness was approximately 8 years. The average period of hospitalization has been from three to four months, and not infrequently as long as from one to two years. A further and an important aspect of this study has been the subsequent observation at frequent intervals of the majority of this group. We ourselves have done the greatest portion of this follow-up study.

From this group of 1,700 patients, only those on whom we have complete data for a full ten years (or more) have been considered suitable for our present purpose. They constitute a special group, 1,000 in number, which will serve as the basis for a comprehensive ten year report now in preparation. Among this group of 1,000 young patients there were 314 (31 per cent) who on recovery from their initial rheumatic infection were left without demonstrable damage to the heart. The subsequent course of these 314 patients with potential rheumatic heart disease serves as the basis of this report.

The Delayed Appearance of Rheumatic Heart Disease.—In table 2 we have indicated the subsequent cardiac status to date for these 314 patients. It is to be noted in this table that the data are complete on the entire group for the first two five year periods after the onset of their rheumatic fever. A considerable number (153)² have also been followed into the second decade. Our present observations must necessarily be confined to the completed decade. There are, however, certain trends already evident in the second ten year period suggestive of the future course of events and, hence, important for our present consideration.

The completed decade covers for the majority of these patients the years from 8 to 18. This in turn embraces the most unstable period in the natural course of their disease—represented on the one hand by the high incidence of recrudescences and fatalities during these early years³ and on the other by the regression of physical signs of cardiac involvement (enlargement and murmurs) in many instances, and complete disappearance in others.⁴

Signs of permanent valvular deformity have appeared to date in seventy-nine patients (25 per cent of the original 314). In approximately two thirds of these seventy-nine patients (fifty-five in number) a recrudescence of rheumatic fever or of chorea was recognized at the time of this later appearance of heart disease. In the remaining one third (twenty-four patients) signs of valvular deformity appeared insidiously without other clinical evidence of coexisting rheumatic activity.

The importance of the first ten years in the natural course of rheumatic fever and rheumatic heart disease already noted is further emphasized by the after-history of this special group. In only five patients have the signs of heart disease appeared to date after this first ten year interval; in two instances with coexisting signs of rheumatic activity, and in three instances without such being recognized. This represents a striking contrast to the number (seventy-four patients) in which the delayed signs of heart disease appeared during the first decade. It seems unlikely that this considerable difference is to be entirely accounted for by the fact that

2. This group of 153 patients shown in table 2 is composed of thirty-eight in whom heart disease had appeared during the preceding decade, four in whom heart disease appeared from ten to fifteen years after the onset of rheumatic fever, and 111 still without signs of heart disease.

3. Bland, E. F., and Jones, T. Duckett: Fatal Rheumatic Fever, *Arch. Int. Med.* 66: 161 (Feb.) 1938.

4. Bland, E. F., and Jones, T. Duckett: Disappearance of the Physical Signs of Rheumatic Heart Disease, *J. A. M. A.* 107: 569-572 (Aug. 22) 1936.

the data are as yet complete on only one half of the original 314 patients for the third five year period.

The twenty-four patients in whom heart disease became evident without evident coexisting clinical signs of rheumatic activity are of special interest. The appearance of valvular deformity in twenty-one of these twenty-four patients during the first ten year period when rheumatic fever is known to be most active strongly suggests that in this "rheumatically" silent group the insidious appearance of valvular disease also coincides with subclinical activity of the rheumatic process. The later occurrence of clearly evident rheumatic fever in eleven of the twenty-four patients lends further support to this interpretation.

Manifestations of Rheumatic Fever.—The manifestations of rheumatic fever in this special group of seventy-nine patients has followed the general pattern of rheumatic fever in our larger series of 1,000 patients. In the majority, however, it has been mild. The initial attack was considered severe in only seven instances. In four additional patients, although the antecedent rheumatic fever had been mild, the later appearance of heart disease coincided with a severe recrudescence. In fourteen additional patients rheumatic fever was of average intensity, but in the remaining fifty-four it was of a decidedly mild order.

Chorea has been a prominent clinical manifestation. It occurred in sixty-four patients (81 per cent), which is a significantly higher incidence than in our larger series of 1,000 patients (50 per cent). In the majority (thirty-eight instances) it was clearly associated with other clinical or laboratory signs of coexisting rheumatic infection; in four patients other evidence of rheumatic activity in addition to chorea occurred after the signs of heart disease had been noted. In the remaining twenty-two instances no indication of rheumatic activity other than chorea could be identified either before or after the appearance of heart disease.

In a previous communication we presented evidence which led us to believe that chorea more often than not occurred as a manifestation of a relatively mild form

of the opinion, previously expressed, that although "pure" chorea is still considered by us a manifestation of rheumatic fever it represents as far as the heart is concerned a relatively mild form of the disease.

A further indication of the relative mildness of the preceding rheumatic fever in this special group is the absence of significant cardiac enlargement in the majority. In sixty patients (76 per cent) there remains either none or, at most, only slight residual enlargement

TABLE 3.—Effect of Recurring Rheumatic Fever on the Later Appearance of Heart Disease

	Number Patients	Still P. R. H. D.	Now R. H. D.
Single Attacks			
Uncomplicated chorea.....	71	66 (93%)	5 (7%)
Rheumatic fever.....	24	22 (91%)	2 (9%)
Rheumatic fever + chorea..	37	36 (97%)	1 (3%)
Totals.....	132	124 (94%)	8 (6%)
Multiple Attacks			
Uncomplicated chorea.....	65	48 (75%)	17 (25%)
Rheumatic fever.....	31	19 (61%)	12 (39%)
Rheumatic fever + chorea..	86	44 (51%)	42 (49%)
Totals.....	182	111 (61%)	71 (39%)

P. R. H. D.: Potential rheumatic heart disease; R. H. D.: Rheumatic heart disease.

of the heart. Auscultatory evidence, however, of deformity of the mitral valve is present in seventy patients, in forty of whom aortic regurgitation is also present. The involvement of the aortic valve is of slight degree in the majority, but peripheral evidence of free regurgitation is present in six instances. In the remaining nine patients aortic regurgitation of slight degree has occurred without definite signs of coexisting involvement of the mitral valve. Aortic stenosis has not yet appeared in this group. In general, the structural alterations in the heart to date have been slight and the impairment of cardiac function minimal. Eleven patients have died. A recrudescence of rheumatic fever was responsible for congestive heart failure and death in ten instances. The remaining patient died suddenly and unexpectedly.

Recurrent Rheumatic Fever and the Later Appearance of Heart Disease.—The unfavorable effect on the heart of recurring rheumatic activity is well shown in table 3. Of the 132 patients who survived their original illness with no demonstrable cardiac involvement and have continued without subsequent rheumatic fever or chorea, only eight (6 per cent) have had signs of valvular disease appear, whereas, in the remaining 182 patients who have experienced recurring episodes of rheumatic activity, signs of valvular deformity have appeared in seventy-one (39 per cent).

COMMENT

The incidence of heart disease appearing later in our series of 314 patients is notably higher than that recently recorded by Boone and Levine.⁶ These observers found that among 166 patients with potential rheumatic heart disease only 4.8 per cent subsequently developed signs of valvular deformity. Their period of observation averaged 9.6 years for the group. This compares with an incidence of 25 per cent in our patients, all of whom have been followed for ten (or more) years. We are of the opinion that this considerable difference in the incidence of heart disease in the two series is to be accounted for by certain important differences in the material studied. It must be remembered that the majority of our patients at the onset of their rheumatic

TABLE 2.—Potential Rheumatic Heart Disease: Subsequent Course

Duration of Follow-Up	Number of Patients	Number	With Recog-nized R. F.	Without Recog-nized R. F.	P. R. H. D.
First Decade: 314 Patients in Whom R. H. D. Developed					
First five years.....	314	37	32	5	277
Second five years.....	314	37	21	16	240
Total first ten years..	314	74	53	21	240
Second Decade: Data Available on 153 Patients					
Third 5 years.....	153	4	2	2	111
Fourth five years.....	91	1	1	1	65
Total for group.....	...	79	55	24	...

R. F.: Rheumatic fever; R. H. D.: Rheumatic heart disease; P. R. H. D.: Potential rheumatic heart disease.

of rheumatic fever.⁵ This conception was based in part on the lower incidence of heart disease in those patients whose rheumatic fever was manifested, among other signs, by chorea than in those with rheumatic fever not associated with chorea. This lower incidence of cardiac involvement was especially striking in the so-called pure chorea group. The late appearance of permanent valvular deformity in a few additional members of this uncomplicated chorea group strengthens

5. Jones, T. Duckett, and Bland, E. F.: Clinical Significance of Chorea as a Manifestation of Rheumatic Fever, *J. A. M. A.* 105: 571-577 (Aug. 24) 1935.

6. Boone, J. A., and Levine, S. A.: Prognosis in "Potential Rheumatic Heart Disease" and "Rheumatic Mitral Insufficiency," *Am. J. M. Sc.* 6:195 (June) 1938.

fever were approximately 8 years of age, whereas the average of the group studied by Boone and Levine was 13.8 years when first seen by them and hence already well along in the decade in which rheumatic fever is known to be most damaging to the heart (namely, from 5 to 15 years of age). We are inclined to accept this apparent discrepancy in these two well studied groups as important additional evidence bearing on the natural course of rheumatic fever in young people. It emphasizes again the already well recognized significance of the events in the earliest years after the onset as most important in determining the subsequent extent of residual cardiac damage.

It remains to be seen how many of those who at present continue without evident heart disease will in later decades develop signs of stenosis of the mitral or aortic valve. The experience of Boone and Levine with the intermediate age group, as well as our own observations on the younger patients already followed into the second decade, are encouraging. A sharply diminishing incidence in the later appearance of valvular disease is to be expected. This prediction is in accord with other recognized features of the natural course of rheumatic fever and of rheumatic heart disease.

It should be emphasized that, although the data here presented concern an unfavorable development in the course of rheumatic heart disease from childhood through adolescence, one must not lose sight of the more favorable course of others. From the broader perspective of the after-histories in our ten year group of 1,000 patients, those in whom heart disease has later developed have been more than balanced by an equal number in whom the signs of heart disease have regressed and ultimately disappeared.

CONCLUSIONS

From a ten year follow-up study of 314 children and adolescents with potential rheumatic heart disease it has been shown that:

1. Characteristic signs of permanent valvular deformity not present at the time of the original illness have appeared later in seventy-nine patients (25 per cent).
2. This so-called delayed appearance of heart disease was clearly associated with coexisting signs of recurrent rheumatic fever in two thirds of the group.
3. In the remaining one third it appeared insidiously. Certain evidence suggests that here also the appearance of the signs of heart disease coincides at this age with persistent subclinical rheumatic activity.
4. Further observation into the second decade indicates that a sharply diminishing incidence in the later appearance of heart disease is to be expected in the remainder.

25 Binney Street.

ABSTRACT OF DISCUSSION

DR. HELEN B. TAUSSIG, Baltimore: This paper has emphasized the late manifestations of rheumatic heart disease. The important feature, it seems to me, is not the number who develop heart disease but the number who escape without cardiac damage. The authors' figures show that only 25 per cent of patients who give no evidence of cardiac damage after their first attack have subsequently developed rheumatic heart disease; of those 25 per cent in only one third did heart disease develop insidiously. I should like to ask Drs. Bland and Jones whether they do not believe that the development of rheumatic heart disease is an indication that these patients are suffering from persistent active infection; in other words, that rheumatic heart disease is not the late result of a former attack but that it is, in itself, an indication of a subclinical attack.

In our clinic we have been impressed by two groups: First, the group who do not report to clinic with the mild illnesses. The second, those who report to the clinic with no complaints but who show a low grade fever and change in quality of heart sounds or in the type of murmur. I believe that such manifestations are indicative of an active infection; in the vast majority of these cases the sedimentation rate has been found to be accelerated. I believe that changing endocardial murmurs indicate an active rheumatic infection. The authors' analysis of single and multiple attacks seems to me highly significant in that the number who have developed chronic rheumatic hearts following a single attack is only about 8 per cent, whereas among those who had multiple attacks it was 39 per cent. This indicates that those who do not have obvious clinical manifestations are much less liable to have subclinical manifestations of disease. I should like to ask about the group of four cases in which signs of heart disease developed ten or more years after the original attack. Did these patients have single or multiple attacks? Did the authors think these cases of heart disease represented the end picture of the early infections or were they reinfections? I concur with the idea that these patients who had little or no cardiac enlargement suffered from mild rheumatic infections. In my opinion, cardiac enlargement is not a late result of previous valvular lesions but is primarily due to myocardial damage.

DR. T. DUCKETT JONES, Boston: I should like to stress one or two general features which Dr. Bland referred to in the series which he reported. The incidence of the late development of rheumatic heart disease is 7.9 per cent of a group of 1,000 patients, followed for a period of ten years. There was a regression or disappearance of the signs of heart disease in about the same percentage of those patients who developed rheumatic heart disease early in the course of their rheumatic fever. The two groups roughly balance each other. Improvement is chiefly due to a lack of recurrences of rheumatic fever. The question of active rheumatic fever is the most pertinent and important feature in determining the outcome in a given rheumatic subject. I know of no more difficult problem than the evaluation of therapy in a disease the cause of which is unknown, and one for which there is no specific diagnostic test. The disease can be diagnosed only by the presence of a more or less clearcut clinical picture or by the resultant rheumatic disease. It is comparable to tuberculosis. I know of no series in which has been proved with adequate controls that long rest and sanatorium care have been the controlling factor in the tuberculosis situation. It seems rational that in caring for patients who have a chronic disease lasting for months, and sometimes years, punctuated by repetitive acute illnesses, usually precipitated by acute respiratory infection, we should give the patient the benefit of perhaps one of the most important laws of nature, namely, rest. I know of no other real reason why we should keep these patients down other than the fact that by taking them out of circulation it removes them from contact with those factors or agents that frequently cause their disease to increase in severity. From the results of our ten years of observation it has been found that 60 per cent of the rheumatic patients who have been given long bed care during active infection are leading normal lives today. About half of these have slight rheumatic heart disease and the other half have no clinical evidence of heart disease. Of the remaining 40 per cent, about 25 per cent die. The remaining 15 per cent enter adult life with moderate to severe rheumatic heart disease and have either moderate or considerable restriction of their physical activities. This 15 per cent represent rheumatic heart disease as it is seen in the adult cardiac clinics and in the wards of the general hospitals.

DR. EDWARD F. BLAND, Boston: We believe, although not yet able to prove it, that the rheumatically "silent" group of patients who develop signs of heart disease represent subclinical rheumatic activity. We have had occasion to follow closely patients who were developing signs of mitral disease without other signs of rheumatic activity at the time. In some instances we were not able to establish clearly an active process by our usual criteria, and yet we felt certain that the rheumatic process was active in the heart. As to the second

question concerning the small group of five patients who, after a latent period of ten or more years, developed signs of heart disease; they were all patients who had in the interim recurring episodes of rheumatic activity. I should like to add one word concerning the effects of pregnancy. Dr. B. J. Walsh has recently reviewed our data in this connection, and he agrees that the majority of these patients, with but few exceptions, go through pregnancy later on without difficulty.

RECURRENCE OF OTITIC INFECTIONS DUE TO THE BETA-HEMOLYTIC STREPTOCOCCUS

FOLLOWING INADEQUATE SULFANILAMIDE THERAPY

JOHN MARQUIS CONVERSE, M.D.

NEW YORK

The extraordinary success of sulfanilamide in the treatment of streptococcal otogenic meningitis has led to the widespread use of the drug in all cases of otitic infection in which the beta-hemolytic streptococcus can be identified. Such enthusiasm for specific chemotherapy is readily understood but is open to considerable criticism. The patient with meningitis is under hospital observation, and treatment is continued until the spinal fluid has returned to normal. The patient with acute otitis media or mastoiditis receives sulfanilamide only as long as there is persistent pain or discharge, and treatment is usually stopped on clinical instead of laboratory evidence.

It has been shown that the sulfanilamide treated animal survivors of hemolytic streptococcus infection fail to acquire protective antibodies as a result of their experience.¹ Lyons² has demonstrated that sulfanilamide induces an attenuation of the virulence of hemolytic streptococci and that the organisms regain their virulence on subcultivation in the absence of sulfanilamide. He has further shown that antibacterial antibody is an important adjunct to sulfanilamide therapy. These facts are important because they demonstrate that inadequate sulfanilamide therapy or premature discontinuance of the drug may permit the infecting streptococci to become fully virulent again in a patient who has no immunity to his infection.

My purpose in this report is to present a series of cases in which it appears likely that the premature cessation of sulfanilamide therapy was followed by recurrence and extension of the original infection.

BACTERIOLOGIC ANALYSIS OF ACUTE SUPPURATIVE OTITIS MEDIA AND SUBSEQUENT MASTOIDITIS

Table 1 demonstrates that only a small percentage of patients with acute suppurative otitis media progressed to mastoiditis, but it is also apparent that the beta-hemolytic streptococcus was present in approximately

half of the cases. The high incidence of streptococci in cases of otitic infection is adequate reason to attempt a clinical evaluation of the usefulness of sulfanilamide in such cases.

RECURRENCE OF ACUTE SUPPURATIVE OTITIS MEDIA AFTER TREATMENT WITH SULFANILAMIDE

In a number of cases of acute streptococcal otitis media, treatment consisted of paracentesis followed by the administration of 16 Gm. of sulfanilamide in divided doses over a three day period. In some of these cases a recurrence of the acute infection was observed on withdrawal of the drug.

The following four cases are reported from the Baby Clinic of the Massachusetts Eye and Ear Infirmary:

CASE 1.—R. S., aged 26 months, who weighed 35½ pounds (16 Kg.), Nov. 15, 1937, had a rectal temperature of 101.2 F. and a paracentesis was performed for suppurative otitis media on the right side. November 17 the rectal temperature was 100 F. and the right ear was draining well. The left drum was red and bulging; paracentesis yielded pus. November 19 a culture of material from the left ear showed hemolytic streptococci. Both ears were draining well. Sulfanilamide was given, 20 grains (1.3 Gm.) the first day, 15 grains (1 Gm.) the second day and 10 grains (0.6 Gm.) the third day. November 24, the condition in both ears was definitely resolving. The discharge had practically ceased.

November 27 the rectal temperature was 104.4 F. The night before, five days after cessation of sulfanilamide therapy, the discharge had reappeared in great abundance from the right ear. Pain was noted in the left ear. Examination disclosed that the right ear was discharging abundant thick yellow pus through

TABLE 1.—*Bacteria Involved in Acute Otitis Media and Incidence of Complicating Mastoiditis**

	Oct., Nov., Dec. 1937	Jan., Feb., March 1938
No. of cases of acute otitis media.....	100	100
Beta-hemolytic streptococci.....	43	40
No. of cases of mastoiditis.....	4	5
Beta-hemolytic streptococci.....	2	3

* Statistics for October-December 1937 collected by author; statistics for January-March 1938 collected by Dr. J. C. Crooker.

the paracentesis opening. The left drum was red and bulging, with closure of the paracentesis incision; paracentesis was performed. December 1 the rectal temperature was 99.4 F. The right ear showed no evidence of resolution and no definite postaural signs, but roentgenograms, interpreted by Dr. A. S. MacMillan, revealed "early decalcification" of the mastoid. The condition in the left ear appeared to be resolving quickly, and the landmarks were returning. Sulfanilamide was administered, 15 grains the first day, 10 grains the second day and 7½ grains (0.5 Gm.) the third and fourth days. December 6 the landmarks were returning on both drums. December 10 there was continued improvement.

December 15, nine days after the cessation of sulfanilamide therapy, the right ear began to discharge abundantly through an anterior-inferior perforation. Beginning December 20 sulfanilamide was administered, 30 grains (2 Gm.) the first day, 20 grains the second day, 15 grains the third day and 10 grains the fourth day. The discharge was still abundant. December 23 there was a marked decrease in the discharge, which was becoming mucoid. December 31 there was complete resolution. All landmarks returned.

CASE 2.—L. L., aged 2 years, who weighed 36 pounds (16 Kg.), Dec. 13, 1937, had bilateral paracentesis for acute suppurative otitis media. December 16 the child was brought back to the hospital, the cultures showing hemolytic streptococci. Sulfanilamide, 25 grains (1.6 Gm.), was given. December 17 a marked decrease in the aural discharge was noticed. The

This work was undertaken in the Mosher Laboratory and the Massachusetts Eye and Ear Infirmary, Boston.

Dr. Champ Lyons revised this paper. The antibody and sulfanilamide determinations were done in his laboratory at the Massachusetts General Hospital.

Read before the Section on Laryngology, Otology and Rhinology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Seastone, C. V.: The Effect of Sulfanilamide (Para-Aminobenzene-sulfonamide) on Group C Hemolytic Streptococcus Infection, *J. Immunol.* 33: (Nov.) 1937.

2. Lyons, Champ, and Ward, H. K.: Studies on Hemolytic Streptococcus of Human Origin: I. Observations on the Virulent, Attenuated, and Avirulent Variants, *J. Exper. Med.* 61: 515 (April) 1935; II. Observations on the Protective Mechanism Against the Virulent Variants, *ibid.* 61: 531 (April) 1935. Lyons, Champ, and Mangiaracine, A. B.: The Effect of Sulfanilamide on Human Virulent Hemolytic Streptococci, unpublished data. Lyons, Champ, in Symposium on Sulfanilamide read at a Wednesday meeting at the Massachusetts Eye and Ear Infirmary.

administration of sulfanilamide was continued, 20 grains being given the first day, 15 grains the second day and 10 grains the third day. December 20 the left ear showed a small amount of pus exuding through a small posterior-inferior perforation. December 23 the condition of the left ear appeared to be resolved and the right ear began to show a return of the landmarks.

December 27, seven days after cessation of sulfanilamide therapy, both ears presented an abundant purulent discharge. December 30 the discharge was increasing. Sulfanilamide was again administered, 25 grains the first day, 20 grains the second day, 15 grains the third day and 5 grains (0.3 Gm.) the fourth day. Jan. 3, 1938, the condition in both ears was resolving. January 6 resolution was complete.

CASE 3.—R. C., aged 6 years, who weighed 54 pounds (24 Kg.), Jan. 17, 1938, had a rectal temperature of 100.8 F. and paracentesis was done for suppurative otitis media on the right side. The child presented acute rhinitis and pharyngitis. January 20 he was brought back complaining of pain in the right ear. The culture in the meantime had been reported to show hemolytic streptococci. The paracentesis incision was open. Sulfanilamide was given, 45 grains (3 Gm.) the first day and 30 grains the second day. January 22 the rectal temperature was 99.4 F. The ear had stopped discharging the previous day, the acute rhinitis and pharyngitis had cleared up and for the first time the child slept throughout the night without complaining of pain. The condition in the right ear appeared to be resolving. Sulfanilamide, 20 grains a day, was administered for two days. January 24 resolution appeared complete.

February 14, twenty-one days after cessation of the sulfanilamide therapy, the child had a rectal temperature of 100.2 F. and again complained of pain in the right ear. The drum appeared thickened, with injection of the malleus handle. February 17 the rectal temperature was 100.2 F. and the patient complained of pain in the left ear and increased pain in the right ear. Examination revealed slight fullness and diffuse injection of the left drum; on the right drum the landmarks could hardly be determined. Instead of a paracentesis, sulfanilamide was prescribed; 45 grains was given the first day and 30 grains the second day. February 19 the temperature was 99 F. The child was much improved, and all landmarks could be made out. There was slight thickening in both drums. Sulfanilamide, 20 grains, was given for three days. February 23 the condition in both ears was resolved.

CASE 4.—J. B., aged 5, who weighed 36¾ pounds (16.7 Kg.), Jan. 31, 1938, had a rectal temperature of 100.4 F. and paracentesis was performed for suppurative otitis media on the right side. February 4 the rectal temperature was 99.8 F. and there was a pulsating discharge from the paracentesis incision. Culture showed hemolytic streptococci. February 9 the rectal temperature was 99.4 F. The condition appeared about the same in the right ear. For the past two days the child had complained of pain in the left ear. The left drum appeared injected and thickened, with a slight bulging of the posterior quadrants. Sulfanilamide, 30 grains, was prescribed. February 10 the temperature was 99.6 F. and the condition unchanged. Sulfanilamide, 15 grains, was given. February 11 there was great improvement. The child had had no symptoms, and the condition of both drums was resolving. Sulfanilamide was administered, 10 grains the first day and 5 grains the second and third days.

February 16, three days after the cessation of sulfanilamide therapy, the rectal temperature was 100.4 F., and that night pain began in the right ear. The next day a discharge appeared and the right drum was bulging and injected. The condition in the left drum was resolved. Paracentesis of the right drum yielded pus. February 17 the rectal temperature was 99 F., and there was a pulsating discharge from the paracentesis incision in the right ear. Sulfanilamide, 20 grains, was administered. February 18 the rectal temperature was 99.2 F. and the child felt better. There was a pulsating discharge, with tenderness over the antrum on the right side. Roentgenograms, interpreted by Dr. A. S. MacMillan, showed "decalcification throughout the right mastoid." March 4 simple mastoidectomy on the right side showed that all the cells were broken down. Recovery was uneventful.

Table 2 summarizes the pertinent data with regard to these recurrences following sulfanilamide therapy. It is felt that the patients received too little of the drug for too short a time. Attention is called to the fact that these doses of sulfanilamide were given in the clinical belief that a small amount of the drug would aid the patient in his attempt to overcome the infecting organisms, but it is obvious that apparent recovery was not maintained after omission of sulfanilamide.

THE LATE OCCURRENCE OF MENINGITIS IN PATIENTS TREATED WITH SMALL DOSES OF SULFANILAMIDE AFTER MASTOIDECTOMY

The three patients in this series were all admitted to the hospital during July 1938.

CASE 5.—B. K., a girl aged 6 years, admitted to the hospital May 19, 1938, with suppurative otitis media on the left side of four and a half weeks' duration, had a rectal temperature of 99.6 F., a pulse rate of 100, a respiratory rate of 24 and a white cell count of 8,300, with 58 per cent polymorphonuclears. A history was obtained that the ear had begun to discharge spontaneously after an attack of influenza. The child had no other complaints.

TABLE 2.—Recurrence of Acute Streptococcal Otitis Media in Children Following Small Doses of Sulfanilamide

Case	Diagnosis	Age	Sulfanilamide		Days of Recurrence*	Final Sulfanilamide		Length of Illness, Days
			Days	Total Dose, Gm.		Days	Total Dose, Gm.	
1	Acute suppurative otitis media.....	26 mo.	3	2.8	5	1	4.8	47
2	Acute suppurative otitis media.....	24 mo.	3	4.5	7	1	4.3	25
3	Acute suppurative otitis media.....	6 yr.	4	7.4	21	5	8.6	38
4	Acute suppurative otitis media.....	5 yr.	3	3.4	3	..	...	31+

* The number of days elapsing after cessation of the sulfanilamide therapy.

The drum of the left ear was thick, with an anterior-inferior perforation; there was a pulsating mucopurulent discharge, and the canal wall appeared to be sagging slightly, but no postaural signs were found. The roentgenograms, interpreted by Dr. A. S. MacMillan, showed "decalcification throughout" the left mastoid. The tonsils had been removed, and palpation revealed a small mass of adenoids in the nasopharynx.

May 21 a report was obtained that the culture of the pus from the left middle ear showed beta-hemolytic streptococci. May 23 sulfanilamide therapy was started; 50 grains (3.2 Gm.) was given the first day, 30 grains the second day and 15 grains each day thereafter. May 25, two days after the sulfanilamide therapy was begun, a simple mastoidectomy was performed on the left side. The mastoid was found to be broken down, especially around the antrum, and to contain pus throughout. No dura or sinus was exposed. Culture showed no growth. June 6 the child was discharged to the outpatient department for dressings, the middle ear being dry and the postaural wound healing well. The sulfanilamide therapy was discontinued.

June 27 the rectal temperature was 103.6 F., the pulse rate 88 and the respiratory rate 30 and the child was readmitted to the hospital. Two days previously she had complained of frontotemporal headache on the left side, which had recurred persistently, increasing in severity; it had kept her awake at night and had made her scream with pain. That day she had presented nausea and vomiting. On admission she was semicomatose. The right middle ear was normal, the left middle ear was dry and the postaural wound on the left was discharging.

thick pus. Moderate injection of the throat was found. The eyes, including the fundi, appeared normal. The neck was stiff, Kernig's sign was present and Babinski's sign was absent. Lumbar puncture showed an initial pressure of 700 mm., normal dynamics, ground glass fluid, and 16,248 cells, with 99 per cent polymorphonuclears. A blood count revealed 32,000 white cells, with 89 per cent polymorphonuclears, and 3,640,000 red cells.

June 28, at 3 a. m., a revision of the left mastoid and decompression were done. Infected granulations were removed; the tegmen was soft and necrotic, there was wide decompression and the dura was injected and covered with a fibrinous exudate. The sinus was exposed in its full length; the wall was gray and covered with a fibrinous exudate. A culture of material from the mastoid showed hemolytic streptococci, as did a culture of the spinal fluid; culture of the blood was negative. Sulfanilamide therapy was started immediately after the operation. The patient was seen in consultation with Dr. Lyons, who advised the securing of a blood level of sulfanilamide of 15 mg. per hundred cubic centimeters. An antibody determination was performed by Dr. Lyons, who found the phagocytic activity to be 12-28 per cent (twelve cocci phagocytized by 28 per cent of twenty-five cells counted). The child was therefore considered as having practically no bacterial antibody. The blood sulfanilamide level was therefore put up to 25 mg. per hundred cubic centimeters (July 1). The patient's condition improved rapidly.

July 2 the first negative report from culture of the spinal fluid was received. The number of cells in the fluid had dropped from 16,248 to 440, with 56 per cent polymorphonuclears. The white blood cell count had dropped from 32,000, with 89 per cent polymorphonuclears, to 21,000, with 92 per cent polymorphonuclears. The rectal temperature was 101 F. July 6 the reports from culture of the spinal fluid had been continually negative, the blood sulfanilamide level had been maintained around 25 mg. per hundred cubic centimeters and the child had improved remarkably. All meningeal signs had disappeared, but she showed signs of anemia; there were 3,200,000 red blood cells and 167 cells in the spinal fluid, with 40 per cent polymorphonuclears. It was decided to stop the sulfanilamide therapy and do a transfusion (300 cc.). During the ensuing period of convalescence, a number of cultures were made of material from the mastoid, and these showed a total absence of hemolytic streptococci. The evolution was toward an uneventful recovery. Dr. Lyons found that there was no increase in the antibody level at this time.

CASE 6.—First Admission.—L. S., a girl aged 9 years, entered the hospital April 15, 1938, with suppurative otitis media on the right side of two weeks' duration, which had followed spontaneous rupture of the drum. The otitis had been preceded by a cold. Three days before entry the patient had presented dizziness, nausea and vomiting, chills and sweats, and headaches on the right side. Two years previously she had had a discharge from the left ear for three weeks. She was thin and pale and complained of pain in the right ear and of right hemicrania. Examination of the right middle ear showed an anterior-inferior perforation through a thickened drum, an abundant purulent discharge and postaural thickening and tenderness. The left middle ear appeared normal. The nose, throat and eyes were normal. Roentgenograms, interpreted by Dr. A. S. MacMillan, showed "decalcification with destruction in the right mastoid." The temperature was 100.8 F., the pulse rate 120, the respiratory rate 27 and the white blood cell count 14,000, with 96 per cent polymorphonuclears.

April 16 a simple mastoidectomy was performed on the right side. Destruction was found about the antrum and also in the tip. A perisinus abscess was found; the sinus was widely uncovered. No dura was exposed. The culture showed hemolytic streptococci. The day after operation sulfanilamide therapy was started; 45 grains was given the first day, 30 grains the second day and 15 grains each day thereafter.

April 18, two days after the operation, the rectal temperature rose to 102 F. The left ear drum became injected and soon began to discharge spontaneously. April 20, four days after the operation, the rectal temperature rose to 105.6 F. There

was no chill. Blood cultures were reported negative. Neurologic examination and examination of the nose, throat and chest gave negative results.

April 21 a roentgenogram was reported by Dr. MacMillan as disclosing "decalcification in the left mastoid." On account of the history of disease in the left ear two years before and the severity of the clinical signs, a simple mastoidectomy on the left and revision of the right mastoid were advised. These operations were done April 21. In the left mastoid destruction was found around the antrum. The rest of the mastoid appeared normal. No dura was exposed. The right mastoid was revised and found filled with granulations. A small area of dura was exposed. The sinus was covered by a pad of healthy granulations in the area previously exposed. The color appeared normal, and the sinus filled well. The temperature curve was irregular, reaching 103 F. during the five days following the operations, and then became flat.

May 8, seventeen days after the operations, both middle ears being dry and both postaural wounds healing, the patient was discharged to the outpatient department. The sulfanilamide therapy was discontinued on discharge.

Second Admission.—The patient was readmitted June 5, twenty-eight days after discharge and cessation of sulfanilamide therapy, with a history of increase of the discharge through the left postaural wound, of vertigo and frontotemporal headache one day before admission and of a chill. The morning of admission she had presented nausea and vomiting and had begun to complain of pain in her left hip. She did not appear particularly ill. Examination of the right ear revealed a dry middle ear and a nearly healed right postaural wound. The left ear showed a purulent discharge from the middle ear and from the postaural wound. The nose and throat were not remarkable. The eyes showed no nystagmus; the fields and fundi were normal. Neurologic examination gave negative results, and lumbar puncture yielded a clear fluid, with an initial pressure of 100 mm., 2 lymphocytes and a normal reaction to the compression test. The temperature was 102.5 F., the pulse rate 116, the respiratory rate 24, the white blood cell count 10,200, with 90 per cent polymorphonuclears, the red blood cell count 4,220,000 and the hemoglobin content 85 per cent. Blood for culture was taken. Roentgenograms disclosed a normal petrous bone and a postoperative mastoid. There were no chills.

June 7 a revision of the left mastoid was done. The sinus appeared thickened in the area previously exposed. June 7, blood cultures showed a growth of hemolytic streptococci. Sulfanilamide was given, 60 grains (3.8 Gm.) the first day, 30 grains the second day, 20 grains the third day and then 15 grains daily. After the operation the temperature became normal and remained so. The blood culture was positive on the day of the operation and negative thereafter. The involvement of the hip rapidly cleared up. The patient's general condition improved rapidly, her only complaint being a fleeting but recurring frontotemporal headache on the right side. Repeated lumbar punctures yielded normal fluid. June 30 the patient was discharged from the hospital and the sulfanilamide therapy was discontinued.

Third Admission.—The patient was readmitted, semicomatose, to the hospital July 6 after what appeared from the family's description to be a generalized convulsion. This was six days after discharge and cessation of the sulfanilamide therapy. The child had complained frequently of frontotemporal headache on the right and had presented nausea and vomiting. There had been no injury to the tongue during the convulsion. She emerged from her semicomatose condition a half hour after admission. The neurologic examination showed a suggestion of rigidity of the neck. Examination of the eyes, nose and throat was unproductive. The right ear showed a completely healed postaural incision and a healed anterior-inferior perforation, and all the landmarks could be made out on the tympanum. Examination of the left ear showed a slight mucopurulent discharge from the lower portion of the postaural incision and from the middle ear through an anterior-inferior perforation. The rectal temperature was 100 F., the pulse rate 130, the respiratory rate 28, the white cell count 21,000,

with 92 per cent polymorphonuclears, the red cell count 3,950,000 and the hemoglobin content 83 per cent (Sahli). Chemical analysis showed protein 22 mg. and sugar 70 mg. The lumbar puncture showed a cloudy fluid with a pressure of 220 and 285 cells, of which 28 per cent were polymorphonuclears, and a positive Tobey-Ayer reaction on the right side. Blood for culture was taken. Dr. Lyons saw the patient in consultation. In view of the previous treatment with sulfanilamide, it was decided to carry the sulfanilamide blood level up to from 20 to 25 mg. per hundred cubic centimeters. Sulfanilamide therapy was started; 150 grains (10 Gm.) in divided doses every four hours was given the first day and 180 grains (11 Gm.) the second day.

July 7, the day after admission, the laboratory reported that the cultures of the blood and the spinal fluid showed beta-hemolytic streptococci. The rectal temperature had not gone over 101 F. There was no chill. The patient was perfectly rational and presented a slightly stiff neck and a suggestion of Kernig's sign. Lumbar puncture yielded a slightly hemorrhagic fluid with a pressure of 350 and 202 cells, 64 per cent of which were polymorphonuclears. Compression tests could not be performed, the patient not cooperating. The eyegrounds were normal.

July 8, on account of the presence of a discharging postaural wound, the left mastoid was reentered and the lateral sinus, which appeared normal, was uncovered from the knee to the bulb. The dura was widely decompressed and appeared normal. A cisternal puncture was then done and yielded hemorrhagic spinal fluid like that obtained by spinal puncture. It was then decided to explore the right mastoid if the headache on the right side persisted. A bacterial antibody test by Dr. Lyons showed 56 per cent of the cells phagocytizing. It was decided that, in view of the relatively high antibody level, the sulfanilamide level could be brought down to 15 mg. per hundred cubic centimeters.

During the next two days the child complained constantly of temporofrontal headache on the right. She had a slightly stiff neck, Kernig's sign was present and there was marked drowsiness. Exploration of the right mastoid was postponed one day. These signs disappeared on the third day. Neurologic signs of localization could be found, and the blood cultures were negative, the spinal fluid cell count was rapidly dropping and all cultures of the spinal fluid were negative. Clinically the patient was improving rapidly.

July 18 all the signs and symptoms had disappeared and the spinal fluid cell count, which had been dropping steadily, reached 11, with 3 polymorphonuclears. All cultures of the blood and spinal fluid were negative. The white blood cell count reached 10,200, with 68 per cent polymorphonuclears. Two transfusions of 250 cc. of blood had been given July 9 and 11. The mastoid wound, which had been left wide open, was filling in with healthy granulations, and the middle ear was dry. The sulfanilamide blood level had been maintained at about 15 mg. per hundred cubic centimeters, during the entire period the highest level reached being 24 mg. and the lowest 10.8 mg. per hundred cubic centimeters.

August 2, in view of sustained improvement and a complete absence of the previous signs, and after three successive cultures of material taken from the mastoid wound showed an absence of hemolytic streptococci, sulfanilamide therapy was stopped. A transfusion of 500 cc. of blood was given; after the cessation of the sulfanilamide therapy and the transfusion, an improvement in the patient's general condition was noted.

August 13 a plastic closure of the left postaural wound was performed, and the patient left the hospital August 20.

CASE 7.—*First Admission.*—R. S., a boy aged 8 years, was admitted to the hospital May 20, 1938, with suppurative otitis media of five weeks' duration on the right side and three weeks' duration on the left side. Three weeks before admission he had had measles, after which the left ear began to discharge. For three days he had a swelling in the left zygomatic area. There were no chills and no headaches. Examination of the right ear showed thick pus draining abundantly through a high anterior perforation. There were no postaural signs. The

left ear showed a thick red drum with a posterior-inferior perforation, thick pus draining, the canal wall sagging, postaural swelling extending into the zygoma and tenderness.

Roentgenograms revealed destruction of the right mastoid and in the left mastoid cells in the tip and over the knee of the sinus. Pus was present. The rectal temperature was 101.2 F., the pulse rate 112, the respiratory rate 28 and the white blood cell count 18,200, with 90 per cent polymorphonuclears. Lumbar puncture disclosed a pressure of 125 mm., clear fluid and no cells. Compression tests suggested a block on the right side.

May 21 a simple mastoidectomy was performed on each side. The right mastoid was completely broken down and contained pus; no dura or sinus was exposed. In the left mastoid the cells were completely broken down and pus was present under pressure. A small arca of sinus was exposed and appeared normal. A large zygomatic development was cleaned out and a subperiosteal abscess drained through an anterior counter incision. No dura was exposed. Cultures showed hemolytic streptococci.

May 23, the day after the operation, the rectal temperature rose to 105 F. There was no chill, and a blood culture was reported negative. There were no neurologic signs. Signs of consolidation were found in the left side of the chest and were confirmed by x-ray examination. May 24 sulfanilamide therapy was begun, 60 grains being given the first day, 40 grains (2.6 Gm.) the second day, 30 grains the third day and 15 grains the following days. May 28 evidence of fluid in the pleural cavity was found. A thoracentesis yielded clear fluid. Cultures of the sputum showed hemolytic streptococci. A culture of the fluid removed by thoracentesis showed no growth.

May 31, the eighth day after operation, the temperature, which had been between 104 and 105 F., came down to 97.5 F. A crisis occurred. The pleural fluid resorbed slowly during the following days. Both mastoids healed rapidly, the middle ears stopped running and June 30 the patient was discharged to the outpatient department. Sulfanilamide therapy was stopped.

Second Admission.—July 9, nine days after discharge and interruption of the sulfanilamide therapy, the patient was readmitted with a history that the day before swelling had appeared in the left zygomatic area. No other symptoms were noted. On admission the right middle ear was dry and there was a small amount of mucopus discharging from the mastoid wound; the left ear showed a discharge of mucopus through a posterior-inferior perforation and through the postaural wound. A diffuse tender swelling was noted in the left zygomatic area. The rectal temperature was 101.5 F., the pulse rate 108, the respiratory rate 24 and the white blood cell count 23,000, with 94 per cent polymorphonuclears. Roentgenograms revealed an abscess of cells in both mastoids. It was decided to employ conservative treatment with hot poultices before revising the left mastoid. The rectal temperature reached 103 F. Two days after admission the temperature was down to 100.5 F. and the zygomatic swelling had disappeared.

July 13, four days after admission, the patient had acute tonsillitis and a culture of material from the throat showed hemolytic streptococci. The temperature rose to 104 F. Sulfanilamide was not administered, but irrigation of the throat was started. Three days later (July 16) the pharynx had cleared up and the temperature was normal.

July 17, seventeen days after cessation of sulfanilamide therapy, the temperature rose suddenly to 102 F. at 3 a. m. The patient began to complain of frontal headache and showed slight stiffness of the neck but no Kernig or Babinski sign. While being examined he presented projectile vomiting. Lumbar puncture showed a pressure of 210 mm. and cloudy fluid with 2,500 cells, 95 per cent of which were polymorphonuclears.

On account of the recent zygomatic involvement on the left side, it was decided to operate immediately on that side. The tegmen was found to be soft and the dura to be injected, granular and covered with a fibrinous exudate. On further decompression the injection of the dura was found to be limited to an area of approximately 2 by 3 cm. All the soft bone of the tegmen was removed. The sinus was widely exposed and appeared normal.

Sulfanilamide therapy was immediately started, 150 grains being given the first twenty-four hours and a blood level of 7.2 mg. being reached within seventeen hours. The next morning the neck was definitely stiff and there was a Kernig sign but no Babinski sign. No other neurologic signs could be found. The spinal fluid taken for culture the previous day was reported in twenty-four hours to show hemolytic streptococci. Blood culture was negative. The level of sulfanilamide in the blood reached 15 mg. per hundred cubic centimeters the second day, was maintained at this point and then was gradually elevated, reaching 24.4 mg. the eleventh day. Improvement was continuous, the meningeal signs disappeared within three days and cultures of the spinal fluid were all negative after the first one.

Sulfanilamide therapy was stopped fourteen days after it was begun, three successive cultures having shown an absence of hemolytic streptococci in the wound. August 13 a plastic closure of the wound was performed, and August 30 the patient was discharged to the outpatient department.

TABLE 3.—Summary of Cases in Which Late Meningitis Developed After Mastoidectomy and Sulfanilamide Therapy

Case	Age, Yr.	Sulfanilamide		Date of Occurrence of Meningitis*	Antibody	Effective Days	Sulfanilamide in Blood, Mg. per 100 Cc.
		Days	Dose, Gm. Daily				
5	6	15	1	20 days	Very low	10	25
6	9	23	1	27 days	Present	27	15
7	8	7	1	17 days	Not determined	14	25

* Days elapsing between the cessation of sulfanilamide therapy and the onset of meningitis.

These cases of late meningitis are summarized in table 3. All three patients recovered, but it required large doses of sulfanilamide to sterilize effectively the spinal fluid. The blood antibody in case 5 was low both before and after therapy. It is felt that in case 6 septic thrombophlebitis on the right side was probably "masked" by the negative blood cultures obtained when the patient was receiving small doses of sulfanilamide. On the basis of this and similar evidence it seems likely that sulfanilamide therapy may produce negative blood cultures when the patient has a persistent septic endophlebitis capable of exacerbation on withdrawal of the drug.

COMMENT

It is believed that this evidence demonstrates that the institution of sulfanilamide therapy creates an obligation to continue it until there is bacteriologic as well as clinical evidence of complete subsidence of infection. Premature cessation of the drug therapy on clinical evidence alone permits exacerbation of the infection in patients whose defensive mechanism is not prepared to deal with residual living streptococci.

Bacteriologic sterility of the inflammatory process is evidenced by:

1. Absence of streptococci and pus cells in smears from the site of infection.

2. Absence of streptococci in cultures made by planting swabs in 10 cc. broth. (It is necessary to dilute the exudate in broth to overcome the bacteriostatic effect of the drug.) Cultures should be repeated from three to five days after discontinuation of sulfanilamide therapy and prior to discharge of the patient. A word of caution is given as to the interpretation of blood cultures from patients receiving sulfanilamide. Negative cultures may be reported because the blood is planted in a quantity of culture broth inadequate to dilute the

drug beyond the bacteriostatic concentration present in the blood. This "masking" effect may lead to oversight of a complicating endophlebitis that merits jugular ligation or further surgical drainage.

The clinical experience with sulfanilamide at the Massachusetts Eye and Ear Infirmary has led to the belief that sulfanilamide should be reserved for the treatment of spreading or life-endangering infections and that it should not be used as an adjunct to the usual measures for the treatment of infections of minor severity. There are three reasons for this belief: 1. Premature initiation of drug therapy has made complete clinical evaluation of the patient difficult, and progress of the infection to a complicating endophlebitis has been obscured during treatment. 2. There has been recurrence and further spread of the infection after omission of sulfanilamide in patients who had clinically appeared to be healed, so that it is clear that the use of sulfanilamide necessitates fairly extensive laboratory studies to confirm the clinical impression of subsidence of the infection. 3. The amount of sulfanilamide required to sterilize a focus of infection is so large that the danger of toxic manifestations necessitates the hospitalization of all patients receiving the drug.

SUMMARY

1. Inadequate sulfanilamide therapy has been followed by recurrence of otitic infections with beta-hemolytic streptococci.

2. The laboratory studies which are required for the effective use of sulfanilamide necessitate hospitalization of patients under treatment.

3. Sulfanilamide therapy should be reserved for the treatment of spreading or life-endangering streptococcal infections.

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ABSTRACT OF DISCUSSION

DR. BERNARD J. McMAHON, St. Louis: Dr. Converse has mentioned the importance of chemotherapy or serotherapy when the response to sulfanilamide therapy is inadequate, since without the timely mobilization of the phagocytic cells at the area of infection chemotherapy will be unavailing. Sulfanilamide can exert a bacteriostatic effect for only a certain length of time before toxic signs may develop; consequently, the adjunct treatments should be resorted to within the first forty-eight to seventy-two hours. Sulfanilamide should not be administered unless the patient is kept in bed and under the careful and constant observation of his physician. It is the duty of the physician to warn patients of the dangers of ill advised and uncontrolled administration of this drug, and one may hopefully look forward to the enactment of legislation in every state prohibiting the sale of sulfanilamide, sulfapyridine and their allied products by the druggist without a physician's prescription.

Lister Was His Own Bacteriologist.—The cause of human disease never has been, and never can be, found purely within the walls of a laboratory; there must be at least some association, direct or indirect, with patients. This association has grown, especially in the case of bacteriology, to be too loose; it is quite necessary to the proper study of many diseases that the association should develop the intimacy which has proved so successful in investigation of tropical disease. Let us remember that Lister was his own bacteriologist. The solution is not usually to be found in what has been termed team work. Can it not be hoped that skilled clinicians will be found in this country who will devote their lives in studying the origin of disease, and who will fit themselves by special and appropriate training for this particular task?—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

GENITAL TUBERCULOSIS

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In this discussion we are primarily interested in genital tuberculosis in the male. Much progress has been made in this field in the past few years.

INCIDENCE

The incidence of genital tuberculosis will of course vary with different authors, depending on the type of material under observation. The average figures given in the literature vary between 2 and 8 per cent of male tuberculous patients. At the Sanatorium of the Jewish Consumptives' Relief Society in the eleven year period of observation (January 1928 to January 1939) sixty-one of a total of 1,316 male patients admitted had genital tuberculosis, an incidence of 4.7 per cent.

Clinical evidence of tuberculosis in the male genital tract occurs during the age of greatest sexual activity, and the vast majority of patients range from 20 to 40 years. In our series the mean age of incidence of genital

TABLE 1.—Incidence of Genital Tuberculosis

Period of Observation—January 1928 to January 1939	
Total number of patients admitted to the sanatorium	1,890
Total number of male patients	1,316, or 69.9%
Total number of male patients with genital, renal or combined urogenital tuberculosis	84, or 6.4%
Total number of male patients with genital tuberculosis	61, or 4.7%
Of the 61 patients with genital tuberculosis	
15, or 24.5%, had associated proved renal tuberculosis	
46, or 75.4%, had no definite evidence of renal tuberculosis	
Of the 61 patients with genital tuberculosis	
58, or 95.0%, had associated far advanced pulmonary tuberculosis	
2, or 3.2%, had associated moderately advanced pulmonary tuberculosis	
1, or 1.6%, had no associated pulmonary tuberculosis	
Of the 61 patients with genital tuberculosis	
53, or 86.8%, had sputum containing tubercle bacilli	
8, or 13.1%, had normal sputum	

tuberculosis was 30 years. That genital tuberculosis may occur at any age is evident by the report of the Greenbergers and Alexander,¹ whose series showed patients ranging from 2 to 67 years of age. It is well recognized that the younger the patient the more virulent the infection. In a greater sense this is also true of pulmonary tuberculosis.

PATHOGENESIS

Genital tuberculosis is accepted as secondary to some other tuberculous focus in the body, the focus being most commonly found in the respiratory system, whether clinically apparent or not. It is agreed that the infection may reach the genital tract directly by way of the blood stream from a focus elsewhere in the body, by way of the lymphatics and, secondarily, by continuity of tissue.

Young's studies bring out the fact that whereas the epididymis attracts more attention and gives more pronounced symptoms, especially at the onset of the disease, the seminal vesicles and the prostate are in fact

the primary seat of the genital tuberculous infection.² The prostate and seminal vesicles are not only the primary focus from which the epididymis is involved but also the focus from which the bladder and the kidneys in many cases are affected. Menville,³ Braasch,⁴ Bumpus and Thompson⁵ and the Greenbergers and Alexander¹ have expressed the same opinion. Barney, Watson and Elliott⁶ and Caulk⁷ have said, on the contrary, that the epididymis is the seat of primary genital involvement and that the infection is hematogenous in origin.

In the opinion of Campbell,⁸ genital tuberculosis without renal involvement is a hematogenous infection and starts in the epididymis, whereas with renal tuberculosis the infection reaches the genital tract by way of the urinary passages. The tuberculous urine bathing the prostatic portion of the urethra causes the prostate and seminal vesicles to be involved first. He further stressed the role as a focus of the avascular vas deferens, which keeps the vesicles and prostate constantly reinfected, most probably by extension along the lumen or possibly by extension along the lymphatics.

Moore⁹ presented histologic and correlative evidence that the bacilli in most cases reach the prostate and seminal vesicles through the blood stream and that the prostatic lesion is secondary to other urogenital lesions in less than 20 per cent of the cases.

There are then two general theories concerning the pathogenesis of tuberculosis of the male genital tract:

1. That the prostate and seminal vesicles are involved primarily in the genital system and that the disease may remain localized or spread as descending genital or ascending renal tuberculosis.
2. That the prostate and seminal vesicles are involved secondarily from other urogenital organs by dissemination through the lumens or walls of hollow viscera connecting them, ascending genital or descending renal tuberculosis.

It must be borne in mind that the presence of genital tuberculosis does not preclude the presence of renal tuberculosis, and vice versa. While the two conditions do commonly occur together, each will occur independently of the other in sufficient frequency to warrant individual consideration. In the eleven year period of our observation there were twenty-three cases of renal tuberculosis without genital involvement, fifteen cases of combined renal and genital tuberculosis and forty-six cases of genital tuberculosis without renal involvement. Furthermore, the presence of urine showing tubercle bacilli on direct smear or guinea pig inoculation is not pathognomonic of renal tuberculosis, since the urine can be infected from a genital tuberculous lesion alone by means of the discharge into the posterior portion of the urethra. In our series of sixty-one cases there were forty-six cases of genital tuberculosis without proved renal involvement, in thirteen of which the urine contained tubercle bacilli.

2. Young, H. H.: (a) Practice of Urology, Philadelphia, W. B. Saunders Company, 1926, vol. 1 p. 326; (b) Tuberculosis of the Genital Tract, J. A. M. A. **104**: 722 (March 2) 1935; (c) Tuberculosis of the Urogenital Tract: Early Diagnosis and Treatment, S. Clin. North America **16**: 1239-1256 (Oct.) 1936.

3. Menville, J. G.: Tuberculosis of Male Genital Tract: Microscopic Study of Post Mortem Material, Proc. Staff Meet., Mayo Clin. **10**: 42 (Jan. 16) 1935.

4. Braasch, W. F., in discussion on Menville.³

5. Bumpus, H. C., Jr., and Thompson, G. J.: Tuberculosis of the Genital Tract, Surg., Gynec. & Obst. **47**: 791-799 (Dec.) 1928.

6. Barney, J. D.; Watson, J. L., and Elliott, S.: The Diagnosis and Treatment of Tuberculosis of the Genital Tract, Am. J. Surg. **10**: 84, 1930.

7. Caulk, J. R., in discussion, Tr. Am. A. Genito-Urin. Surgeons **13**: 272-273, 1920.

8. Campbell, H. E.: The Rationale of Epididymovasectomy in Genital Tuberculosis, J. Urol. **34**: 135-141, 1935.

9. Moore, H.: Some Problems in Diagnosis and Treatment of Genito-Urinary Tuberculosis, M. J. Australia **1**: 137-143 (Feb.) 1933.

Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

From the Urological and Medical Services of the Sanatorium of the Jewish Consumptives' Relief Society, Spivak, Colo. Apparatus from the Max Straus Physiotherapy Department.

1. Greenberger, A. J.; Greenberger, M. E., and Alexander, H.: Tuberculosis of the Male Genital Tract, Quart. Bull. Sea View Hosp. **1**: 425-441 (July) 1936.

It is our belief, based on our clinicopathologic observations, that the disease most frequently starts in the vesicles and prostate but may occasionally start in the epididymis. The mode of infection is primarily hematogenous.

Genital tuberculosis is principally a disease of the structures apart from the testis, the latter remaining intact in the presence of extensive long standing dis-

TABLE 2.—*Relation of Onset of Genital Tuberculosis to That of Pulmonary Tuberculosis in Sixty-One Cases*

Mean age of onset of pulmonary tuberculosis about 27 years
Mean age of onset of genital tuberculosis about 30 years

Of the 61 cases of genital tuberculosis

Genital tuberculosis developed in 47 from 1 to 20 years after pulmonary tuberculosis, but in the majority within 3 to 10 years

In 5 cases genital tuberculosis developed from 1 to 5 years before the onset of pulmonary tuberculosis

In 7 the patient was unaware of his genital tuberculosis, which was diagnosed on admission

In 1 the onset was not known

In 1 pulmonary tuberculosis has not yet developed

case of the epididymis, only becoming involved by contiguity very late. In the large majority of cases, both epididymides eventually show clinical evidence of tuberculosis, though there may be a long interval before this is observed.

DIAGNOSIS

The difficulty in accurate diagnosis of the scrotal and prostatic masses has been emphasized frequently, yet the chief underlying cause is incomplete investigation.

The only method available for the examination of the prostate and seminal vesicles is palpation with the finger in the rectum. In the early stages of the disease no change may be demonstrable by this means of examination, but in the vast majority of cases definite signs are present. Irregular, firm but not stony hard nodules in the prostate recognized by means of touch indicate extensive involvement of this organ. Likewise when the seminal vesicles are felt as pencil-like bands, extending in an upward and outward direction

TABLE 3.—*Classification of Genital Tuberculosis*

1. Catarrhal

A lesion clinically characterized by predominant evidence of tissue breakdown; this lesion is soft or even fluctuant and the masses are as a rule comparatively large; there is no evidence of sinus formation, although it may seem imminent; the presence of a hydrocele (allergic effusion) will place a lesion in this class

2. Ulcerative

A lesion clinically characterized by the presence of draining scrotal sinuses, irrespective of the state of the scrotal mass

3. Fibroid

A lesion clinically characterized by predominant evidence of fibrosis or calcification; there are no soft or fluctuant masses and no hydrocele or sinus formation; a lesion with a hard fibrotic scrotal mass and with old, healed, not active sinuses may be included in this class

Occurrence of the Types of Genital Tuberculosis

In the 61 cases there were

8 cases of catarrhal genital tuberculosis, in 8 of which there was no evidence of renal tuberculosis

21 cases of ulcerative genital tuberculosis, in 5 of which there was proved renal tuberculosis and in 16 of which there was no evidence of renal tuberculosis

32 cases of fibroid genital tuberculosis, in 10 of which there was proved renal tuberculosis and in 22 of which there was no evidence of renal tuberculosis

from the upper margin of the prostate, extensive involvement of these organs is indicated.

Examination of the external genitalia is best done with the patient in a standing position facing the surgeon. Observations are made of alterations in the normal rugose appearance of the skin of the scrotum, the shape of the testicles and their relative position in respect to each other. Changes in the scrotal skin are

sometimes a valuable guide, as shown by a smoothing out of the rugae and a wasting of the cellular tissue immediately beneath the dermis. Adhesion of the skin to the epididymis is a well known sign, as is also a sinus discharging creamy pus. A comparison of the mobility of the two testicles is sometimes helpful. A normal organ can be moved freely within its covering, particularly in the upward and downward direction. This movement is often restricted when tuberculosis of the genital organs is present. In the early stages a soft or even fluctuant mass at the site of the epididymis and involving it is present in a large percentage of cases. If untreated, it will result in ulceration and formation of a chronic sinus discharging pus or it will become a hard, fibrotic or calcific mass. Late in the disease the epididymis may entirely lose its identity or, if it can be palpated, will be craggy and nodular. The vas becomes thickened and has beadlike prominences.

CLASSIFICATION

Genital tuberculosis has the same macroscopic and microscopic characteristics as tuberculosis elsewhere in the body, and its clinical-pathologic behavior simulates

TABLE 4.—*Other Extrapulmonary Tuberculous Lesions Associated with Genital Tuberculosis (Exclusive of Renal Tuberculosis)*

Of the 61 cases of genital tuberculosis

In 27, or 44.2%, the condition was not associated with other extrapulmonary tuberculous lesions

In 34, or 55.7%, the condition was associated with other extrapulmonary tuberculous lesions

In 26 there was only one extrapulmonary tuberculous lesion

14, tuberculosis of the larynx

5, tuberculosis of the osseous system

3, tuberculous ischio-rectal fistula

2, tuberculous chronic otitis media

2, ileocecal tuberculosis

In 8 there was more than one extrapulmonary tuberculous lesion

3, tuberculosis of larynx and ileocecum

2, tuberculosis of larynx and osseous system

1, tuberculosis of ileocecum and osseous system

1, tuberculosis of larynx and ischio-rectum

1, tuberculosis of skin and osseous system

Total

20 cases, associated tuberculosis of the larynx

9 cases, associated tuberculosis of the osseous system

4 cases, associated tuberculous ischio-rectal fistula

6 cases, associated ileocecal tuberculosis

2 cases, associated tuberculous otitis media

1 case, associated tuberculosis of the skin

that of pulmonary tuberculosis. The phthisiologist has long been classifying pulmonary tuberculous lesions into various types, depending on the predominant pathologic process, and has based the necessity for a sanatorium regimen, the indications for collapse therapy and the prognosis on the clinical-pathologic classification. Similar types of tuberculous lesions exist in the case of genital involvement and show a parallel response to treatment. A discussion on genital tuberculosis which does not take into consideration the clinical-pathologic type of tuberculosis but merely includes all cases under a blanket heading of genital tuberculosis is not justified.

We have divided the genital tuberculosis in our cases into three main classes, as shown in table 3.

As is true of pulmonary tuberculosis, these types represent various stages in the tuberculous pathologic process, the end result being fibrosis.

OTHER EXTRAPULMONARY LESIONS ASSOCIATED WITH GENITAL TUBERCULOSIS

If the mode of infection in genital tuberculosis is hematogenous, as stated, it would be logical to suppose that other parts of the human anatomy would become seats of tuberculous infection at the same time as the

genitalia, while the blood stream was laden with tuberculous bacillary emboli. This is indeed the fact. In our series thirty-four patients, or 55.7 per cent, had tuberculous lesions outside the lungs and kidneys.

The prevalence of other extrapulmonary tuberculous lesions associated with genital tuberculosis strengthens the theory of the hematogenous route of infection.

PROGNOSIS

The life expectancy of the patient with far advanced cavernous pulmonary tuberculosis who has received no form of active therapy was studied by Schwatt and Rest¹⁰ at our institution. The 267 patients had a racial and sociologic background similar to that in our series. They found that only 38 per cent of the untreated patients with this type of tuberculosis were alive at the end of the three to ten year period. In our

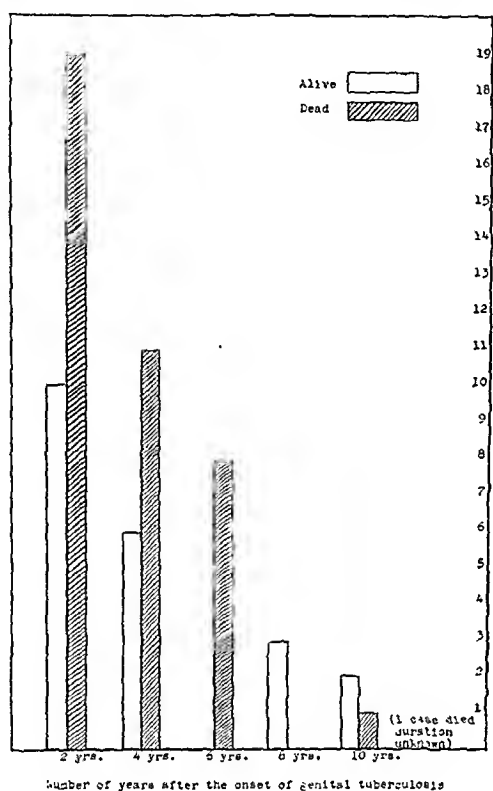


Fig. 1.—Life expectancy of patients with genital tuberculosis (sixty-one patients). Note that this is not parallel to that of patients with far advanced pulmonary tuberculosis, as it is generally accepted to be.

series 95 per cent of the patients had far advanced pulmonary tuberculosis and 27.8 per cent received successful pulmonary collapse therapy. Our patients therefore were in much better condition than those of Schwatt and Rest, who did not receive collapse therapy, and should have shown a much longer life span if the prognosis of genital tuberculosis cases depends entirely on the prognosis of the associated pulmonary lesion. On the contrary, at the end of a one to eleven year period of observation only 34.4 per cent of our patients were alive. It becomes obvious then that the presence of genital tuberculosis adds considerably to the gravity of the general disease and shortens the life expectancy.

The cause of death was as a rule attributed to tuberculosis in general, although three patients died of tuberculous meningitis and three of uremia with a basis of renal tuberculosis.

10. Schwatt H., and Rest, A.: Prognosis of the Cavity Bearer. *Am. Rev. Tuberc.* 37: 65-70 (Jan.) 1938.

During the period of observation, of the patients with the catarrhal type four, or 50 per cent, died; of those with the ulcerative type fifteen, or 71 per cent, died, and of those with the fibroid type twenty-one, or 65 per cent, died.

TREATMENT

There are two distinct schools of thought with reference to therapy. The surgical treatment recommended varies from a careful resection of the infected focus¹¹ to the complete removal of the seminal tract.¹² The immediate mortality rate of radical surgical management, the persistent draining sinuses that are frequent sequelae of such intervention and the false rationale of removing a single focus and leaving the primarily infected prostate have placed this form of therapy in general disrepute among phthisiologists and urologists versed in the management of tuberculosis.¹³

The beneficial effect of ultraviolet therapy in extrapulmonary tuberculosis has been well known for many years. Myl¹⁴ reported most favorably on cases of treatment with solar exposure at the Fitzsimons General Hospital in Denver. Other authors have reported successful results in the treatment of genital tuberculosis with ultraviolet therapy¹⁵ and a sanatorium regimen.¹⁶ It is logical to choose a form of therapy which will lend itself to sharp localization to the desired areas, that is the prostate, the seminal vesicles and the epididymis, thus producing the maximum local effect without doing any general harm. Irradiation of the epididymis alone has been common practice among the men who advocate this form of physical therapy for genital tuberculosis. It is our belief that if radiation was given with equal intensity to the prostate and seminal vesicles, the most frequent primary seat of tuberculous infection in the genital tract, the result would be more certain and more rapid and reactivation would be less likely to occur.

GENERAL CONSIDERATIONS OF ULTRAVIOLET RADIATION

The crythemagenic efficiency of a lamp as tested on untanned skin is of importance in determining the individual sensitivity of the patient to the ray in order to avoid serious burns, but it is not a measure of the therapeutic action of the source of ultraviolet ray.¹⁷ The popular use of the presence and extent of erythema as an index of therapeutic efficiency of a lamp is erroneously founded. Certain sources of radiation capable of producing erythema in a comparatively short time have little therapeutic effectiveness, and vice versa. Other criteria for determining the therapeutic value of

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12. Lowsley, O. S., and Duff, J.: Tuberculosis of the Prostate Gland, *Ann. Surg.* 91: 106-114 (Jan.) 1930. Hinman, Frank: The Surgical Treatment of Lower Tract Tuberculosis, Genital and Vesical, *J. Urol.* 20: 521-540 (Nov.) 1928. Young,²⁵

13. White, E. W., and Gaines, R. B.: Concerning Genital Tuberculosis, *Illinois M. J.* 70: 78-82 (July) 1936.

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15. Wang, S. L.: The Treatment of Inoperable and Postoperative Tuberculosis of the Urinary Tract, *J. A. M. A.* 88: 1872-1875 (June 11) 1927.

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TABLE 5.—Report of Cases of Genital Tuberculosis Treated by Means of Ultraviolet Radiation of the Wavelength 2,537 Angstroms

Case No.	Age, Yr.	Classification and Duration of Pulmonary Tuberculosis	Clinical Status	Complications	Duration of Genital Tuberculosis	Type of Genital Tuberculosis	Anatomic Involvement	Renal Status	Previous Treatment of Genital Tuberculosis	Results	Period of Treatment with Ultraviolet Rays, 2,537 Angstroms	Results
1	37	Far advanced; 3 yr.; thoracoplasty	Ambulant and clinically well; working	None	2 yr.	Catarrhal	Right epididymis, prostate	No tuberculous; results of cystoscopic examination negative	None	.....	14 mo.	Absorption of mass; no sinus formation; small residual in right epididymis and prostate
2	25	Far advanced; 10 yr.; pneumothorax discontinued	Ambulant and clinically well; working	None	1 yr. 2 mo	Catarrhal	Left epididymis, prostate	No tuberculous; normal	None	.....	10 mo.	Absorption of mass; no sinus formation; moderate residual in left epididymis and prostate
3	38	Moderately advanced; 1 yr.	Ambulant and clinically well; working outside of sanatorium	None	Diagnosed on admission	Catarrhal	Left epididymis, prostate	No tuberculous; normal	None	.....	3 mo.	Reduction in size of mass; no sinus formation; moderate residual in left epididymis and prostate
4	32	Far advanced; 8 yr.	Bed patient	Ischiorectal abscess	4 mo.	Catarrhal	Left epididymis, prostate, left seminal vesicle	Urine contained tubercle bacilli; no renal lesion proved	None	.....	5 mo.	Reduction and hardening of mass; no sinus formation; residual in prostate and seminal vesicle
5	28	Far advanced; 4 yr.	Bed patient	Tuberculosis of larynx	1 yr. 11 mo.	Ulcerative	Both epididymides, prostate, seminal vesicle; bilateral scrotal sinuses	Albuminuria; urine did not contain tubercle bacilli; no renal tuberculous	Ultraviolet irradiation with water-cooled machine, 3 mo.	No effect	39 mo.	Closure of all scrotal sinuses; marked reduction in size of scrotal mass and prostate
6	39	Far advanced; 6 yr.; phrenic avulsion on left	Ambulant and clinically well	None	2 yr. 1 mo.	Ulcerative	Both epididymides, prostate, seminal vesicle; bilateral scrotal sinuses	No tuberculous; normal	Irregular and infrequent ultraviolet radiation	No effect	18 mo.	Closure of all scrotal sinuses; marked reduction in size of scrotal mass and prostate
7	24	Far advanced; 10 yr.; thoracoplasty	Ambulant and clinically well; not in sanatorium	None	3 yr. 9 mo.	Ulcerative	Right epididymis, prostate; bilateral scrotal sinuses	Albuminuria and occasional pus; urine contained tubercle bacilli	Ultraviolet irradiation with water-cooled and water-cooled machine; 2 yr.	Slight reduction in mass; sinuses not affected	12 mo.	Closure of two sinuses and reduction of third to minimum; marked reduction in size of scrotal mass and prostate
8	35	Far advanced; 19 yr.	Ambulant and clinically well; not in sanatorium	None	2 yr.	Ulcerative	Right epididymis, prostate; scrotal sinuses on right	Nephrectomy on right for tuberculous; 8 yr. before	Natural heliotherapy	No effect	1 mo.	Slight reduction in size of scrotal mass; marked reduction of drainage from sinuses
9	51	Far advanced; 9 yr.	Bed patient	Ossous tuberculosis; tuberculosis of skin	8 yr.	Ulcerative	Both (right residual) epididymides, prostate, seminal vesicle; multiple scrotal sinuses	Bilateral renal tuberculous; early nonprotein nitrogen retention	Infrared and ultraviolet irradiation 3 yr. before; removal of scrotal mass on right 7 yr. before	Closure of sinuses until 3 yr. before; increase in size of scrotal mass	4 mo.	Marked reduction in drainage from sinuses and one sinus closed; no change in size of mass
10	35	No pulmonary tuberculosis	Ambulant and clinically well	None	2 yr. 3 mo.	Fibroid	Left epididymis, prostate	Nephrectomy on left and epididymectomy and orchiectomy on right 1½ yr. before; tuberculous	None	.....	12 mo.	Reduction of scrotal mass almost to normal; no change in prostate
11	33	Far advanced; 7 yr.; phrenic avulsion on left; pneumothorax on right	Ambulant and clinically well	None	1 yr. 9 mo.	Fibroid	Left epididymis and seminal vesicle, prostate	No tuberculous; results of cystoscopic examination negative	None	.....	16 mo.	Slight reduction in size of scrotal mass; no other change
12	52	Far advanced; 25 yr.; thoracoplasty	Bed patient	Chronic tuberculous otitis media	4 yr.	Fibroid	Left epididymis, prostate	Renal tuberculous on left proved by cystoscopic examination	Ultraviolet irradiation 3 yr. before	Increase in fibrosis and retraction of both cords	11 mo.	No remarkable change
13	45	Far advanced; 17 yr.	Ambulant and clinically well; not in sanatorium	Chronic tuberculous otitis media	3 mo.	Fibroid	Prostate only	Urine contained tubercle bacilli; no evidence of renal tuberculous	None	.....	5 mo.	No remarkable change
14	44	Far advanced; 1½ yr.; pneumothorax	Ambulant and clinically well	None	3 yr.	Fibroid	Right epididymis and seminal vesicle, prostate	No tuberculous; results of cystoscopic examination negative	None	.....	5 mo.	No remarkable change
15	43	Far advanced; 1 yr.	Bed patient	Tuberculosis of larynx	Diagnosed on admission	Fibroid	Right epididymis and seminal vesicle, prostate	No evidence of renal tuberculous	None	.....	5 mo.	No remarkable change

a commercial lamp must then be employed. The rational means of evaluation of the therapeutic efficiency of the commercial sources of the ultraviolet ray are based on the quantitative and qualitative characteristics of the spectrum emission. After careful study we have chosen the so-called cold quartz lamp as the source of ultraviolet ray in the treatment of genital tuberculosis.

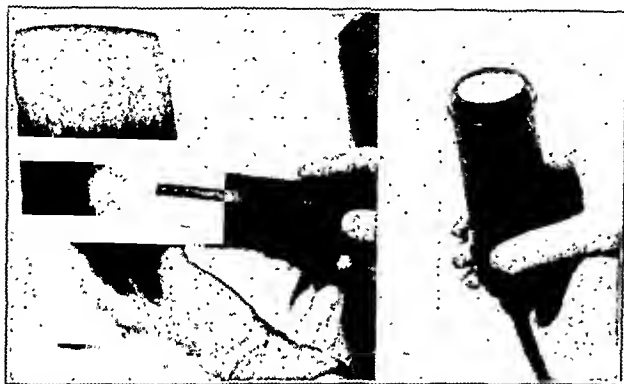


Fig. 2.—Treatment of the epididymis with topical applicator of the so-called cold quartz ultraviolet lamp. Note that the burner is at contact to the scrotal skin and that the epididymis is held against the burner by the operator's hand.

This has essentially a low vapor pressure, a low amperage (0.015 amperes), a high potential (5,000 volts, open circuit) and a glow discharge similar to the well known Geissler tube. The power consumed is small and consequently there is no great rise in the temperature of the burner.¹⁸ The advantages of this commercial source of ultraviolet rays lie in its effective administration and its characteristic spectrum emission. The burner is "cold," exceeding room temperature only after about an hour of continuous operation, and thus the actual source of radiation can be placed directly on and in contact with the target. This fact increases the total quantitative output of the so-called generator manyfold as compared with other commercial sources

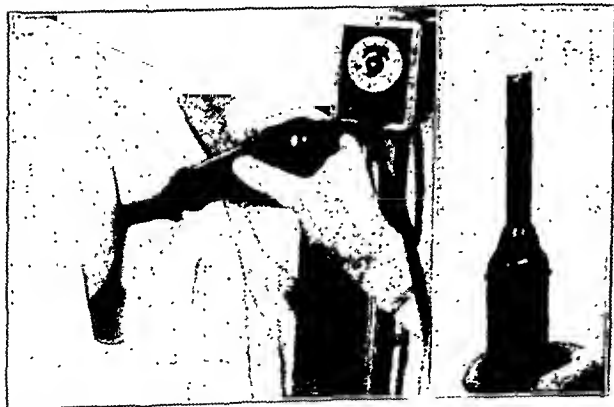


Fig. 3.—Treatment of prostate and seminal vesicles with the rectal applicator of the so-called cold quartz ultraviolet lamp. Note that the applicator is covered to within 6 cm. of its tip to prevent exposure to the anal sphincter and that the applicator is tipped so that the exposed end lies directly on the prostate and seminal vesicles.

of ultraviolet ray. The latter, because of the heat generated at the burner, must be kept some distance from the target (the air cooled machines at least 36 inches and the water cooled machines from 3 to 6 inches, depending on the type of quartz conduit used). Since ultraviolet rays are essentially light rays, they are dis-

seminated inversely to the square of the distance. When the factor of air absorption is added to the loss by dissemination, it becomes obvious that the machine which will permit application of the source in contact with the target will deliver a greater quantity of ultraviolet rays than a machine whose burner must be kept at a distance from the area under irradiation.

The mechanical ease of manipulation and the immediate maximum output (there is no "warming up" period characteristic of other commercial sources) make the so-called cold quartz apparatus very desirable. The various applicators which emit radiation with equal intensity at all points and angles and which are available for topical, orificial, rectal and anal irradiation at contact to the tissues involved add further to the clinical efficiency of administration. While the quantitative appreciation of ultraviolet irradiation has been commonplace since its inception, the qualitative studies of the ultraviolet spectrum and the characteristics of its component wavelengths have been of recent origin in the clinical literature. Most of the commercial sources of ultraviolet rays produce radiation of mixed wavelengths,



Fig. 4 (case 1).—Result of treatment of genital tuberculosis of the entarial type. Note the complete gross restitution to normal. On palpation a small fibrotic residual could be detected in the epididymis. The prostate was small and fibrotic.

predominantly between 2,537 and 3,130 angstroms,¹⁹ while the so-called cold quartz lamp emits a spectrum whose intensity along a wavelength of 2,537 angstroms is within 95 per cent of its total spectrum emission, to all practical purposes a monochromatic radiation.¹⁹ The biologic effects of monochromatic ultraviolet radiation in the wavelength of 2,537 angstroms have been extensively studied. The bactericidal action (*Bacillus coli*),²⁰ growth restriction of tissue culture,²¹ coagulation of albumin²² and hemolysis²³ have their peak effectiveness with radiation in the region of a 2,537 angstrom wavelength. The peak of the ergosterol activation curve (formation of vitamin D) has been credited by some workers to wavelengths other than 2,537 angstroms,²⁴ and Van Wijk and Reerink have even claimed destruction of vitamin D by radiation of this wavelength. A greater number of workers have,

19. Caulk,¹² Behneman,¹⁵ Coblentz.¹⁴

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however, found ultraviolet radiation of the wavelength 2,537 angstroms unusually active in the production of vitamin D, both in vitro by activation of ergosterol and in vivo by cure of rickets in experimental animals.²⁵

MODE OF TREATMENT

In our series we employed the monochromatic ultraviolet radiation of 2,537 angstroms emitted (95 per cent) by the so-called cold quartz lamp as the sole direct therapeutic agent. All irradiation was done with the burner in direct contact with the tissues treated. Treatment was given twice weekly. The initial dose of fifteen seconds exposure was given to each epididymis by scrotal contact and to the prostate and seminal vesicles through the rectum. This was increased by fifteen seconds weekly, until at the end of the first seven weeks of treatment a full two minutes treatment was given

TABLE 6.—Summary of Results in the Treatment of Genital Tuberculosis By Means of Monochromatic Ultraviolet Radiation with a Wavelength of 2,537 Angstroms

1. Fifteen patients with genital tuberculosis were treated with ultraviolet radiation of the wavelength 2,537 angstroms for from 1 to 19 months
2. Four patients with catarrhal genital tuberculosis were thus treated with
 - (a) Prevention of sinus formation in all 4
 - (b) Absorption of the scrotal and prostate masses, with small residuals, in 2
 - (c) Reduction in the size of the masses in the scrotum and prostate in 2
3. Five patients with ulcerative genital tuberculosis were thus treated with
 - (a) Complete closure of all sinuses in 2
 - (b) Closure of some of the sinuses, with reduction in drainage from the remaining sinuses, in 2
 - (c) Marked reduction in drainage from all sinuses in 1
 - (d) Marked reduction in the scrotal and prostate masses in 4
 - (e) No change in the masses in 1
4. Six patients with fibroid genital tuberculosis were thus treated with
 - (a) Reduction in the size of scrotal and prostate masses in 1
 - (b) Slight reduction in the size of the scrotal mass in 1
 - (c) No remarkable change in 4

Conclusions

1. Ultraviolet radiation of wavelength 2,537 angstroms is of greatest value in the treatment of catarrhal and ulcerative genital tuberculosis and of lesser value in the treatment of fibroid genital tuberculosis
2. The most distressing complication of genital tuberculosis, draining sinuses, has been successfully prevented in cases of the catarrhal type in which breakdown of the tissue seemed imminent and successfully eliminated in cases in which it was already present; the patients with incomplete closure of the sinuses can be considered as not yet adequately treated
3. This form of treatment has been less effective, if at all so, in the treatment of fibroid genital tuberculosis; this condition, like fibroid pulmonary tuberculosis, presents the predominant picture of healing by fibrosis and in all probability does not require any treatment

over each area treated. Treatment was continued semi-weekly without interruption for from ten to twelve months, after which there was a two months rest period. Only patients who showed inadequate improvement from the first course were given the second. Total and differential white blood counts were made twice monthly in anticipation of the leukopenia occasionally seen as a result of heavy ultraviolet therapy, but this condition was never seen in our cases.

RESULTS OF TREATMENT OF GENITAL TUBERCULOSIS WITH MONOCHROMATIC ULTRAVIOLET RADIATION OF 2,537 ANGSTROMS

The period of observation in this group of cases was from one half to two years. The majority of the patients had had their genital tuberculosis for two years or longer. With two exceptions the condition was associated with far advanced pulmonary disease. Of the twenty-one patients with genital tuberculosis (in our series of sixty-one) who are alive at the present time,

fifteen received monochromatic ultraviolet radiation of 2,537 angstroms. While the greatest mortality for the entire series with genital tuberculosis was for the first two years of the illness, the majority of these fifteen patients had their disease two years or longer, and none of this group have died. The results appear striking in spite of the brief period of observation.

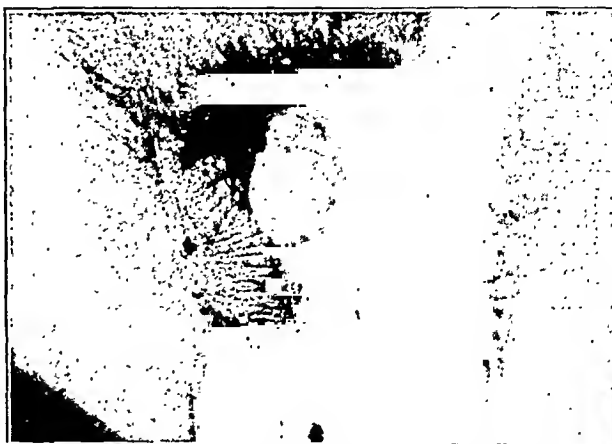


Fig. 5 (case 5).—Result of treatment of genital tuberculosis of the ulcerative type. Note the healed scrotal sinuses and the restitution of the normal rugose appearance of the scrotum. Reduction in the size of the scrotal mass was marked, and the epididymis was no longer embedded in the mass and could be individually palpated. The prostate was markedly reduced in size and was firm. The seminal vesicles were barely palpable.

From the social and economic standpoint this form of treatment is also very favorable. Of these patients only five are undergoing absolute bed rest; four are totally ambulant, two are ambulant and working in the sanatorium and four are clinically well and living outside the sanatorium and working. The favorable effect on the progress of the far advanced pulmonary tuber-



Fig. 6 (case 11).—Result of treatment of genital tuberculosis of the fibroid type. Note only slight reduction in the size of the scrotal mass and the absence of other demonstrable change.

culosis in these cases by the arrest of the genital tuberculosis cannot be denied. This form of therapy aptly lends itself to office practice.

In the analysis of the results obtained in the treatment of genital tuberculosis by means of ultraviolet radiation of 2,537 angstroms, the need for the aforementioned classification of genital tuberculosis becomes apparent. In the cases of the catarrhal type the results were the most striking.

The ulcerative type of genital tuberculosis showed the next best results.

25. Goldblatt, H.: Prevention and Cure of Rickets in Rats and Anti-rachitic Activation of Ergosterol by Cold Quartz Mercury Lamp, *Proc. Soc. Exper. Biol. & Med.* 30: 380-383 (Dec.) 1932. Windaus, A.: Einige weitere Erfahrungen über das bestrahlte Ergosterin, *Nachr. Ges. Wiss. Göttingen* 1: 36-37, 1930. Action of Monochromatic Actinic Radiation, editorial, *Arch. Phys. Therapy* 14: 107-109 (Feb.) 1933.

The third type of genital tuberculosis, that is the fibroid type, showed the least apparent change under treatment.

SUMMARY

1. A statistical analysis of cases of genital tuberculosis observed in an eleven year period of 1,316 male admissions to the Sanatorium of the Jewish Consumptives' Relief Society was presented.

2. A classification for genital tuberculosis was proposed, based on the clinicopathologic interpretation of the lesions and their response to treatment.

3. Ultraviolet ray therapy was advocated in preference to surgical treatment of genital tuberculosis, and encouraging results in the treatment of the catarrhal and ulcerative types was reported.

4. The consideration of the quantitative and qualitative spectrum output of a commercial source of ultraviolet ray based on the individual biophysical characteristics was stressed.

ABSTRACT OF DISCUSSION

DR. HOMER C. HAMER, Indianapolis: The authors present a summary of the results of treatment of fifteen cases of genital tuberculosis by ultraviolet radiation. Since no mention is made as to what treatment was given in the remaining forty-six cases of the series, it may be inferred that orthodox methods were employed. If so, a comparison of results would be interesting and it is to be hoped that a later report may give data in the other forty-six cases. In the five cases with sinuses, complete closure had occurred in two. There was improvement in two cases and no change in one case. Of the six cases of fibroid tuberculosis, two were improved while four showed no change. The results obtained in the series by palliative treatment may be as good as could be expected in a group of cases of far advanced tuberculosis, in some of which possibly even conservative surgery was contraindicated. Yet one may question whether the prognosis was greatly improved. Spontaneous arrest of the disease sometimes occurs, which tendency would be enhanced by sanatorium treatment, but there is little justification for nonoperative treatment in operable cases. Epididymectomy or castration is advocated by the majority of surgeons. Good results are reported by Young and others who advocate radical excision of the seminal vesicle, prostate, vas and epididymis, together with the testicle if it is involved. The mortality and operative results are about the same whichever site of primary focus is adhered to and whether conservative or radical surgery is performed. From 53 to 80 per cent of clinical cures are obtained by epididymectomy. Local morbidity following this operation is slight. Sinus formation following high excision of the vas is uncommon. The observation of most observers is that following epididymectomy the disease in the seminal vesicles and prostate not only ceases but retrogresses to a point of clinical cure. It is highly improbable that the operation, conservative or radical, removes all the tuberculous tissue. Arrest of the disease following operation depends on the ability of the body defense to control the remaining infection. Palliative treatment preceding and following operation in the more advanced cases should enhance the success of surgery. From the results obtained by Drs. Miller and Lustok, it is fair to predict that ultraviolet radiation may find a place as an adjuvant to the surgical treatment of genital tuberculosis.

DR. M. J. LUSTOK, Spivak, Colo.: I would stress the point that we are dealing with persons who came to Denver primarily for the treatment of pulmonary tuberculosis. These patients are different in their behavior from the group which presents genital tuberculosis alone without clinical pulmonary involvement. We are convinced that genital tuberculosis adds to the gravity of the pulmonary disease and that the prognosis of the individual is not dependent on the progress of the pulmonary disease alone. The successful management of the genital tuberculosis is as important as the management of the pulmonary tuberculosis in the treatment of an individual so afflicted.

THE BRONCHOSCOPIST AND THE
THORACIC SURGERY TEAM

M. F. ARBUCKLE, M.D.

AND

A. C. STUTSMAN, M.D.

ST. LOUIS

After several years' experience as members of a thoracic surgery team, we have become convinced of the importance and value of teamwork in the diagnosis and treatment of numerous types of pulmonary disorders. Although there is not unanimous accord with the following statement, we feel that thoracic surgery has already become a highly specialized division of general surgery and that special training for this type of surgery is required.

The improved methods of diagnosis and treatment now available make it possible to obtain results in the treatment of certain varieties of pulmonary disorder which are far better than have been achieved heretofore. Treatment of some of these conditions may be carried out by so-called medical care alone, this may be combined with bronchoscopic treatment, or the two methods may be combined with surgical intervention. As an adjunct to medical treatment we find that bronchoscopic treatment is much more efficacious in certain conditions, notably lung abscess, than we had reason to believe only a short time ago. In some pulmonary disorders it is true that relief is to be found only through surgical intervention, an outstanding example being endobronchial cancer. Either lobectomy or total pneumonectomy is at the present time the only hope for curing this disease, which until five years ago had a mortality rate of 100 per cent. As is well known, in April 1933 the first successful total pneumonectomy as a means of treating cancer of the lung was carried out by Dr. Ewart Graham.¹ The patient is alive and carrying on with his profession as an obstetrician without a sign of recurrence. The microscopic diagnosis of cancer in this case was established by study of a biopsy specimen obtained by us through the bronchoscope. Dr. Graham informed us on Dec. 23, 1938, that in the last seven cases of total pneumonectomy for cancer of the lung there had been only one operative death. Before the planning of treatment for this or any other obscure pulmonary condition, such as abscess, unexplained endobronchial stenosis or unexplained variation in tuberculosis, a diagnosis is essential, and an absolute diagnosis is particularly important in the case of tumor of the lung. It is obvious that the only method of making a definite diagnosis of a tumor is by study of a biopsy specimen, which can be obtained only with the bronchoscope.

As a result of our experience and from conversation with men from other centers we are convinced that the most successful operations on the chest are accomplished as a result of teamwork by a group of men, each a specialist in his own field, who collaborate in each case in establishing the diagnosis and in outlining and administering treatment. Such a group properly consists of an internist who is especially interested in thoracic disorders, a thoracic surgeon who is a specialist in this

From the Chest Service, Washington University Hospital Group, and the Mallinckrodt Institute of Radiology.

Read before the joint meeting of the Middle Section of the Laryngological, Rhinological and Otolological Society and the Sioux Valley Eye and Ear Academy, Sioux City, Iowa, Jan. 19, 1939.

1. Graham, E. A., and Singer, J. J.: Successful Removal of an Entire Lung for Carcinoma of the Bronchus. *J. A. M. A.* 101:1371-1374 (Oct. 28) 1933.

field by reason of actual and thorough training, a bronchoscopist similarly qualified, an expert radiologist, a pathologist and a bacteriologist. It would seem that special training on the part of the pathologist in the field of tumors of the tracheobronchial tree increases his usefulness as a member of a thoracic surgery team. Tumors of all kinds are difficult of classification in some instances when a decision is wanted as to malignancy, but apparently tumors of the respiratory tract possess this quality in a more marked degree than do ordinary tumors. The difference of opinion and the occasional inability to establish an opinion are based on sound reasoning. One possible explanation is the fact, often unrecognized, that a tumor may be made up of more than one variety of cells. We have in our laboratory a specimen of an endobronchial cancer in which at least four grades (Broders²) of cells have been found. Many pathologists, radiologists and cancerologists feel that the degree of radiosensitivity of a given tumor may be prophesied within limits by the microscopic appearance of its cellular make-up. It is well known that tumors frequently do not live up to this prognostication. The presence of several varieties of

duction of the oil will be far more satisfactory if the operating room is equipped with adequate x-ray apparatus and if the tube is focused before the oil is put in so that the exposure may be made before the position of the oil is disturbed by coughing. Interpretation of bronchograms presupposes an accurate knowledge of the topographic anatomy of the tracheobronchial tree. The bronchoscopist, furthermore, is a more valuable member of the team if he is also a trained otolaryngologist, because of the fact that many pulmonary disorders are secondary to those of the upper respiratory tract.

Bronchoscopic examination entails much more than the mere introduction of the bronchoscope, but it is very important that the instrument be passed into the trachea without injury to the lips, teeth, tongue, gums, pharynx or larynx and without mental hazard to the patient. Careful inspection will reveal notable departures from the normal, if they are present, in the visible portion of the tracheobronchial tree, namely the larynx, trachea and the larger bronchi and even the opening of the bronchus to the various lobes. With instruments especially designed for this purpose, we are at times

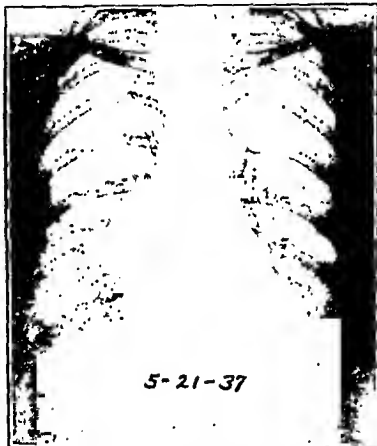


Fig. 1 (case 1).—A plain anteroposterior film showed a tumor in the right lung near the border of the heart. The patient was a woman aged 65.



Fig. 2 (case 1).—A localizing anteroposterior bronchogram showed blocking of the bronchus to the middle lobe of the right lung.



Fig. 3 (case 1).—A localizing lateral bronchogram showed blocking of the bronchus to the middle lobe of the right lung with atelectasis. In view of this information the bronchoscope was introduced directly into the bronchus of the middle lobe after the necessary dilation had been carried out. The tumor was then visualized and a biopsy specimen recovered. A diagnosis of benign adenoma was made by microscopic examination, and roentgen treatment was recommended.

cells within the tumor, unrecognized because of failure to study the entire tumor, may be the basis for this disappointment.

Most pulmonary disorders may be discovered and recognized by means of x-ray and physical study, but they may be much more accurately localized and their exact nature may be more definitely established by visual examination through the bronchoscope and the study of specimens obtained during the examination. The bronchoscopist will carry on more satisfactorily when and if he is competent to make a physical examination of the chest and to interpret films for himself. Bronchograms may be made as a rule by the house officer working with the team, according to the simple method suggested by Singer,³ whereby the oil is introduced directly into the larynx with the patient in front of the fluoroscope. In an occasional case this is impossible, and then the oil is introduced through the bronchoscope and a film made while the patient is on the table. Bronchograms made by bronchoscopic intro-

enabled to see lesions well up within a branch bronchus. Some of the changes to be found are alterations in the position, shape and size of the tubes; the presence of blood or pus in the tubes; changes in the appearance of the mucosa, including its color, and the presence of ulcer, scar tissue, tumor masses and, of course, foreign body. Thus, for example, changes in the position, shape and size of the tubes may be caused by pressure on their walls by a tumor mass which is located outside the tubes. Similar changes may be caused by the pressure accompanying pneumothorax, by a mass of enlarged glands or by adhesions. Inflammatory changes in the mucosa itself will encroach on the lumen but usually do not change the actual shape of the tube or its position. As is true with inflammation elsewhere in the body, there is usually redness as well as swelling. When one finds blood or pus or both one must localize the lesion by tracing these secretions to their source. This is best accomplished by the use of suction and repeated inspection at the same sitting. We are presup-

2. Broders, A. C.: Grading of Cancer: Its Relationship to Metastasis and Prognosis, *Texas State J. Med.* 29: 520-525 (Dec.) 1933.
3. Singer, J. J.: A Simple Method of Introducing Iodized Oil into the Lungs, *J. A. M. A.* 87: 1298-1299 (Oct. 16) 1926.

posing, of course, careful physical and x-ray examinations, including the making of bronchograms, before bronchoscopic examination is carried out.

When scar tissue is found as a basis for endobronchial stenosis the stricture must be dilated, secretions carefully collected for bacteriologic study and evidence of recent inflammatory reaction noted. In such cases tuberculosis and syphilis must be ruled out. Indeed it should be routine practice to secure a specimen of secretions whenever possible, for laboratory study, including, when indicated, guinea pig injections. The rather unusual disorder, such as actinomycosis or other fungous disease, will be detected in this way, while otherwise the diagnosis might be missed. We have observed an occasional case in which tubercle bacilli in the pulmonary secretions were demonstrated in a specimen obtained by bronchoscopic suction when the patient did not have sufficient sputum to cough up a specimen in the amount required for examination. We have one patient who had localized tuberculosis in the upper lobe of the left lung with blocking of one of the

At all times the bronchoscopist must be prepared to deal with hemorrhage. This is of comparatively rare occurrence, but when it does happen it is a most serious matter and requires immediate and exact management if one is to avoid asphyxiation as soon as the blood clots, which it does promptly, or possible exsanguination or postoperative complications such as pneumonia.

Avoidance of mental hazard to the patient is an important feature always, but particularly when the patient is suspected of having tumor or other disorder for the relief of which surgical intervention will be required later. We find that we have much less difficulty in arranging for such treatment if the patient has been shielded at the time of the bronchoscopic examination, and also we are certain that if the patient is asleep the bronchoscopic examination can be carried out in a much more satisfactory manner. For these reasons we have employed avertin with amylene hydrate for all our bronchoscopic examinations for several years, and we see no reason to alter this practice.

An occasional case is observed in which by bronchographic examination one may establish that the obstructive



Fig. 4 (case 1).—This view and others showed a decrease in the size of the tumor and in the area of atelectasis.



Fig. 5 (case 2).—Pudding denotes the area of granulation tissue which was treated by actual cautery. The patient was a woman aged 36.



Fig. 6 (case 3).—A filling defect in the trachea extends from the level of the second rib posteriorly down into the lower lobe of the right lung, where extensive bronchiectasis is seen. The tuberculous granulations in the trachea and at the opening of the right bronchus were removed with the biting forceps and the actual cautery. The patient was a woman aged 37.

branches of the bronchus of this lobe by granulation tissue and subsequent atelectasis. The differential diagnosis between cancer and tuberculosis was made by studying secretions obtained with a curved suction tube which at the same time traumatized the granulation tissue so that it bled. The application of suction and the bleeding were followed promptly by ventilation and drainage of the atelectatic lung. This patient was treated locally and by general medical care three years ago. She was away from her employment for the period of about a year but has been back at work for two years.

When a tumor mass is found, its position must be definitely established by actual measurement and a biopsy specimen taken. Some time ago one of us (M. F. A.) described a method of measuring the distance between the proximal portion of a tumor and the carina. This method is highly important to the thoracic surgeon when he is contemplating surgical removal of a lobe or a lung. Tumors in the vicinity of the carina have a tendency to grow by direct extension across the dividing line and obstruct the bronchus of the other side. Temporary relief of obstructive symptoms may be afforded by removal of the tumor with the forceps and the actual cautery.

tive lesion is within one of the smaller bronchi at sufficient depth to place it beyond the range of ordinary bronchoscopic visibility, or it may be in a bronchus which is placed at such an angle as to prevent introduction of the bronchoscope (figs. 1, 2, 3 and 4, case 1). In the former instance it occasionally is possible to dilate the bronchus sufficiently to introduce the bronchoscope and permit visualization and recovery of a biopsy specimen under visual guidance; or it may be necessary to take the biopsy specimen without actually seeing the tumor by simply introducing the forceps to the point indicated on the bronchogram. This method is obviously unsatisfactory for numerous reasons and of course is employed only of necessity. The results are conclusive only when positive. We have had one case of carcinoma of the upper lobe of the right lung in which the tumor was around the corner to such an extent that it was impossible to see it or get the forceps up to it. By inducing artificial pneumothorax with the patient supine and then placing him in a semiprone position, it was first demonstrated that there were no adhesions between the lung and the parietal pleura in the apical region.

Later the bronchoscope was introduced, and again the air was allowed to float up, as does the bubble in the carpenter's level, under fluoroscopic guidance with the bronchoscope in position and with the pneumothorax needle in position. More air was then introduced, and the tumor was forced down under fluoroscopic visualization until the lumen of the bronchus containing the tumor was on an axis parallel with that of the bronchoscope. The bronchoscope was then pushed into the bronchus containing the tumor, the tumor visualized and a specimen taken. The results of biopsy in this instance were negative for cancer, but transthoracic exploration confirmed the inferential diagnosis of endobronchial carcinoma. The method of taking biopsy specimens from endobronchial tumors, or from other tumors, for that matter, is a subject worthy of considerable discussion, but for lack of space we will merely say that more than once we have had negative results from a biopsy when we felt certain that the correct diagnosis was cancer. In some instances it was discovered that the reason for the failure to demonstrate cancer cells was that the specimen was not cut deeply enough through

lene hydrate and local anesthesia. The lesions have entirely disappeared and the sputum has become free from tubercle bacilli. The patient had no untoward constitutional reaction from any of the several applications of the cautery.

The second patient (fig. 6, case 3) was a young married woman who had had pulmonary tuberculosis for some time and who finally came to us because of continued difficulty with breathing. She had a high degree of tracheal stenosis with stridor and cyanosis. The tracheal obstruction was readily demonstrable with films made after injection of iodized oil. Inspection revealed the fact that her trachea was filled, except for a narrow slit, with granulation tissue from a point about midway between the cricoid cartilage and the bifurcation down to and into the right main bronchus. She also had a severe bronchiectasis in the lower lobe of the right lung, which was the affected side. We have been able with the biopsy forceps and the cautery to relieve her respiratory difficulty and with the suction to relieve the signs of absorption which she was getting from the bronchiectasis. We realize of course that this



Fig. 7 (case 4).—A filling defect in the lower lobe of the left lung behind the heart and close to the midline shows the location of a bronchiectatic lesion at this point. This observation was confirmed by endobronchial inspection and by examination of the specimen after lobectomy. The patient was a boy aged 10 years.



Fig. 8 (case 5).—A filling defect in the right main bronchus denotes the point of lodgment of a foreign body, removed through the bronchoscope. This body probably caused the bronchiectasis. The nature of the bronchial obstruction could not be established except by direct inspection. A diagnosis of tumor had been made and was not untenable. The patient was a woman aged 42.

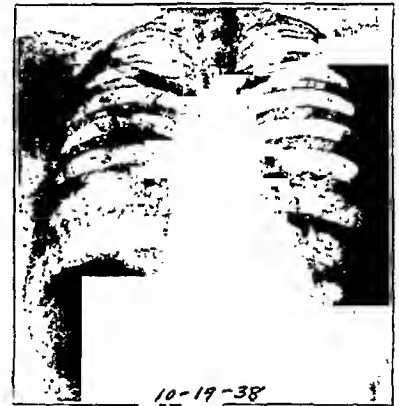


Fig. 9 (case 6).—A post-tonsillectomy lung abscess of three years' duration in a woman aged 38. The plain roentgenogram showed a shadow in the lower lobe of the right lung which at first glance appeared to be in the upper lobe (a mistake which is commonly made). After detailed study for localization the abscess was demonstrated to be in the apical division of the lower lobe.

the surrounding layer of fibrous tissue to include the cancer cells. This is exactly what happened in this case. In other cases the specimen was taken from the immediate vicinity of the tumor rather than from the tumor itself.

For years we have been on the lookout for localized lesions of the tracheobronchial tree in tuberculous patients, but not until comparatively recently was it our fortune to see one that could be identified as such, and then came three in rapid succession in Dr. Graham's service.

The first patient (fig. 5, case 2) had had a successful pneumothorax but the sputum had continued to show tubercle bacilli, which the internist and the thoracic surgeon were at a loss to explain. Bronchoscopic examination revealed the fact that she had an ulcer on the surface of the carina on the side of the affected lung and an ulcer and granuloma in the bronchus to the upper lobe on the affected side. These were treated by repeated applications of the actual cautery through the bronchoscope with the patient under avertin with amy-

is almost a hopeless situation, but we are trying to free the trachea of its involvement in the hope that we may later be able to recommend a lobectomy or a pneumonectomy for the tuberculosis and bronchiectasis.

The third patient was a physician's wife who also had long standing tuberculosis on the right side and pneumothorax. When it was decided to let the lung expand by releasing the pneumothorax, the lung failed to expand. When she came to Barnes Hospital she had severe respiratory difficulty with marked stridor and cyanosis. Bronchoscopic examination revealed a high degree of obstruction at the lower end of the trachea caused by external pressure and displacement into the lumen of the wall on the left side. There was also present a mass of granulation tissue which completely obstructed the right main bronchus at the carina. It was necessary to apply some force in passing a 9 mm. bronchoscope through the obstruction in order to displace outward the tracheal wall. Then the granulomas were visualized and touched with the actual cautery. With the first treatment the patient had immediate relief

from dyspnea and cyanosis, and she has continued to improve with subsequent treatments. The lung has expanded somewhat.

Bronchiectasis is a disease of frequent occurrence and may be found at any age. It occasionally is complicated by hemorrhage due to ulceration into a sizable blood vessel. The hemorrhage may be severe enough to necessitate lobectomy as an emergency measure. Such a condition was found in a 10 year old boy (fig. 7, case 4), who had had pneumonia six months prior to admission to the St. Louis Children's Hospital in the service of Dr. Evarts Graham in the summer of 1938. When admitted he was having pulmonary hemorrhage several times a day, and he had required numerous blood transfusions before coming to St. Louis. On his arrival it was found that his red cells numbered 3,200,000 and his white cells 8,600 and that his hemoglobin content was 70 per cent. He continued to spit up blood in the amount of 150 to 250 cc. once or twice a day. A plain film showed evidence of disorder in the lower lobe of the left lung behind the heart. A bronchogram made immediately by the direct method showed a filling defect in the same region. On bronchoscopic examination we found the tracheobronchial tree more

is well known, was done years ago, but this method of treatment was more or less abandoned because of the terrific mortality rate. With the methods of today a well trained thoracic surgeon has no hesitation in recommending a lobectomy in a suitable case. Our own operative mortality is now less than 5 per cent.⁴

Abscess of the lung is an important and serious disease of rather frequent occurrence, in the diagnosis and treatment of which the bronchoscopist may play a most important part. First of all, abscess of the lung in adults not infrequently is caused by a foreign body or by failure of resolution of a disease such as pneumonia, and not infrequently it is the result of bronchial obstruction by an endobronchial cancer. We as laryngologists are especially interested in the condition, since in a high percentage of cases it follows tonsillectomy. Inspection of the tracheobronchial tree in search of the cause as well as for the purpose of localization is important in diagnosis and treatment. We have found that a fairly good percentage of the patients will make complete recovery by bronchoscopic treatment combined with medical care, which consists chiefly of rest in bed and postural drainage. This is contrary to the opinion which we held a few years ago. Bronchoscopic treat-

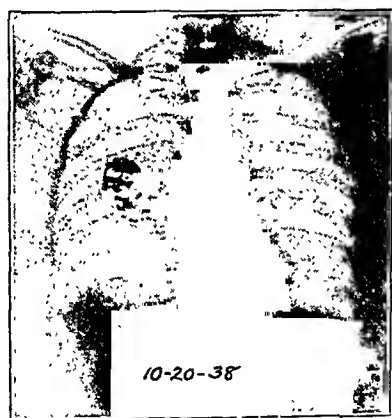


Fig. 10 (case 6).—Iodized oil was injected into the abscess cavity after removal of granulation tissue from the fistulous opening and evacuation of inspissated pus.



Fig. 11 (case 6).—The important lateral view demonstrates beyond doubt that the abscess is in the apical division of the lower lobe.



Fig. 12 (case 6).—Remarkable clearing in keeping with the patient's general condition, which, as far as one can make out from her statement, is normal.

or less blood stained throughout. With the application of suction it was found that the source of this blood was in the mesial division of the bronchus to the lower lobe of the left lung. A diagnosis of bronchiectasis with ulcer localized to the lower lobe of the left lung was made and immediate lobectomy recommended. This was done on the following morning, two transfusions having been required in the meantime. The diagnosis was confirmed at operation, and the accompanying illustration (fig. 7) shows the involvement of the lobe itself. The boy made an uncomplicated recovery and has had no hemorrhage since the operation.

Every patient with bronchiectasis should have at least one bronchoscopic examination because of the possible presence of an unsuspected foreign body (fig. 8, case 5) or bronchial stenosis caused by scar tissue or granulation tissue. If a foreign body is found, removal will promote drainage and ventilation and help to improve the patient's general condition. Bronchoscopic therapy alone will not cure bronchiectasis, but it does make life more livable for the patient and improves his chances for recovery if lobectomy is to be done later. We are convinced that once bronchiectasis is well established the only hope of cure is surgical removal of the affected portion of the lung. Lobectomy for bronchiectasis, as

ment of abscess of the lung as we apply it consists in the removal of granulation tissue if present from around the fistula leading into the abscess by the use of the sponge curet, the biting forceps or sometimes the cautery, dilation of the fistula, the use of special suction tubes and the introduction of remedies which we think help to reduce the virulence of the infection. These consist of 1 per cent guaiacol in oil of sweet almond and iodized poppyseed oil in spite of discussion pro and con. It is our feeling that iodized poppyseed oil introduced into these cavities, even for bronchographic examination, often has a very salutary effect on the infection present. Coupled with such treatment we always carry on with postural drainage. Careful study of properly made localizing films before bronchoscopic treatment facilitates entering the cavity. The study of laminagrams helps us in deciding whether or not the abscess cavity is single or multiple.

We have had made several special flexible metallic suction tubes with which we have been able to enter and drain abscess cavities which we could not otherwise reach through the bronchoscope. We have one patient who had had an abscess for three years following

4. Graham, E. A.; Singer, J. J., and Ballon, Harry C.: *Surgical Diseases of the Chest*, Philadelphia, Lea & Febiger, 1935.

tonsillectomy. According to her own statement, the bronchoscope had been used twenty-seven times before she came into Dr. Graham's service (figs. 9, 10 11 and 12, case 6). At the first sitting we found granulation tissue obstructing the fistula leading into the abscess. After removal of this granulation tissue the stench was so terrific that the assistants and nurses in the room were sickened by it. With one of the special flexible tubes we were able to enter the cavity, which was very large and which was filled with inspissated pus. In this case, as in another case which we are here-with reporting (figs. 13, 14 and 15, case 7), there was momentarily free bleeding apparently from granulation tissue. According to our experience such bleeding apparently diminishes the granulation tissue and improves drainage. The chronic unilocular abscess with exuberant granulation tissue which bleeds when suction or sponging is done and which has a very foul odor offers a good prognosis for recovery with bronchoscopic treatment alone. The bleeding is usually readily controllable by the application of epinephrine and cocaine on a sponge. Sometimes even this is not required.

When one considers the difference in the hazard between bronchoscopic treatment of lung abscess and

considerably increased. One reason for the increase in the number of positive diagnoses almost certainly is the fact that more accurate diagnostic methods are being employed. There are authorities who think that there is an actual increase, and while this may be true we are inclined to think that the increase is more apparent than real. Until well within our time the diagnosis of endobronchial cancer was made by inference, until the patient came to the autopsy table, or until the cancer filled the pleural cavity, or until occasionally a piece was broken off and coughed up or until metastasis to a superficial location permitted biopsy. Now in a large percentage of cases it is possible actually to secure a biopsy specimen from endobronchial tumors, and, as we remarked earlier in this paper, actually to localize the tumor. Tuttle and Womack⁵ from a study of our cases found that as a rule there is a much greater life expectancy for the patient whose endobronchial cancer is in the larger tubes than for the one whose cancer arises in the smaller tubes. It is also possible at times for the bronchoscopist to obtain by palpation with the end of the bronchoscope some idea as to the presence or absence of fixation of the hilar portion of the lung by pleural adhesions or by pressure from a peribronchial tumor.



Fig. 13 (case 7).—Involvement of the lung early in the course of the disease in a man aged 21 referred to us by Dr. John R. De Velling, Rosiclare, Ill., Aug. 25, 1938. Plate shows area of infiltration of the right hilar region, which was again the apical division of the lower lobe. There is no cavitation at this time.

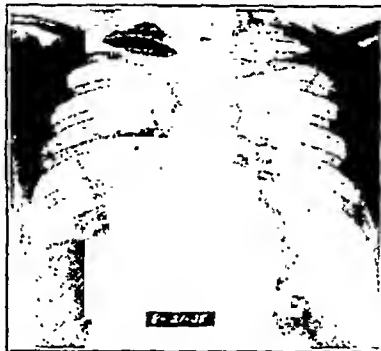


Fig. 14 (case 7).—Plate made four months later for comparison shows increased distribution of infiltration with cavitation in the center of the shadow. Aug. 25, 1938, with bronchoscopic visualization granulation tissue was removed from the fistula leading to the abscess in the apical division of the lower lobe of the right lung and a large quantity of inspissated and extremely foul-smelling pus was evacuated with the special suction tip. Although the patient had had a septic temperature for about a year, his temperature promptly fell to normal, and on the following day, to use his own expression, he had "an appetite like a horse." After three bronchoscopic treatments he returned to his home, and a communication from him dated Nov. 3, 1938, stated that he was entirely well.



Fig. 15 (case 7).—The improvement in the appearance of the chest, visible even at an early date.

external drainage through the chest wall, one realizes how important is the fact that a respectable percentage of patients will get well with this comparatively simple method of treatment. We have been looking over our case records in an effort to discover if possible some method of telling beforehand which patients will and which will not get well with bronchoscopic treatment. To date our only means of answering the question is to institute treatment.

It is recognized of course that a large percentage of all patients with lung abscess recover spontaneously, some without any medical care and many with so little medical care that it amounts to the same thing, while others will recover with rest and postural drainage. But there remain a group who do not recover with this method of treatment, and it is with these that we as bronchoscopists are concerned.

The diagnosis of cancer of the lung is being made much more frequently than it was only a very few years ago, so much more frequently in fact that the incidence in comparison with that of all types of cancer has been

When operations on the lung through the chest wall are to be carried out, we find that for several reasons it is important for the bronchoscopist to be on hand in the operating room and ready to work. The type of anesthesia which is best when the chest wall is opened is endotracheal anesthesia administered by an endotracheal tube connected with apparatus for accurate control of the intrapulmonary pressure. The anesthetist occasionally has difficulty in introducing the endotracheal tube, and the bronchoscopist can help with this. In all types of lung suppuration it has been demonstrated by numerous other workers as well as by ourselves that bronchoscopic suction immediately before and after operation almost surely prevents not only respiratory difficulty during the operation but also the development of postoperative pneumonia.

By the prompt introduction of the bronchoscope and the application of suction, we have been able on several occasions to save the life of a patient who, because of complete tracheal obstruction by pus and blood, had stopped breathing on the table. In each instance after

5. Tuttle, W. M., and Womack, N. A.: Bronchogenic Carcinoma: Classification in Relation to Treatment and Prognosis, *J. Thoracic Surg.* 4: 125-146 (Dec.) 1934.

the trachea had been cleared the patient breathed again, the operation on the lung was completed and the patient is now alive and well. One interesting example is that of a small child with a lung abscess possibly caused by a foreign body. Her condition was so precarious that a preliminary introduction of the bronchoscope was postponed because we felt that immediate drainage of the lung abscess was her most urgent need. After the incision had been made, pleural adhesions had been found, an abscess had been located with a needle and the surgeon, Dr. Brian Blades, had begun to apply the actual cautery to uncap the abscess, the child suddenly quit breathing. She was said to have died of an embolus. Since one of us (M. F. A.) was standing by the head of the table and the bronchoscope was ready for use, immediate inspection of the trachea was undertaken. This showed that its lower end was entirely filled with a blood clot, which came away rapidly in one piece with the suction. With cleaning up of the pus which filled the bronchus and with artificial respiration the child resumed breathing and the operation on the abscess was finished. We had a letter from her mother at Christmas 1938 reporting that she was in perfect health.

Another patient with bronchiectasis, an adolescent who had had preoperative bronchoscopic suction, became cyanotic and quit breathing in the midst of the operation for lobectomy. This operation was abandoned for the moment while bronchoscopic suction was immediately applied by one of us (A. C. S.), who was on hand and ready to work. As soon as the airway was cleared the patient began to breathe, the operation on the lung was completed and the patient made an uneventful recovery.

CONCLUSIONS

Because of improved diagnostic and therapeutic methods, the outlook for persons suffering from a rather wide variety of pulmonary disorders has improved tremendously during the past decade. Of importance in the application of these methods of study and treatment is the realization that this is a special field in which, in order to obtain the best results, the work must be carried out by a group each member of which has been thoroughly trained for his particular job. In our service some of the members of this group find it necessary to have their own individual teams in order to carry on more satisfactorily with their phase of the work.

The epoch making developments in thoracic surgery of the past five or ten years have depended not only on improved surgical technic, anesthesia and postoperative as well as preoperative care, all of which are of first importance, but also on better x-ray and pathologic studies. Probably the greatest single step forward has been early and actual diagnosis by direct inspection of the lesion.

The presence of pulmonary disorder of almost any type may be demonstrated by the usual methods of study, namely physical and x-ray, but unfortunately such studies do not reveal in many cases the exact nature of the disease nor do they demonstrate its endobronchial distribution. These usually may be established by direct endobronchial inspection and by the study of specimens obtained during the course of this inspection.

The same approach is extremely valuable in the treatment of certain varieties of pulmonary disorder, prominent among which are lung abscess and localized tuberculous lesions. The percentage of cures obtained

by bronchoscopic treatment in cases of lung abscess demonstrates the necessity for keeping in mind this method when outlining treatment in such cases. It is of course the accepted method for removal of a foreign body and is the only approach for applying direct treatment to localized tuberculous lesions.

In establishing the cause and location of unexplained pulmonary bleeding, direct inspection (bronchoscopic) has been found most helpful. We have had no unfavorable reaction as a result of the necessary manipulations, and it is our feeling that the propitious time for such examination is while bleeding is active.

539 North Grand Avenue.

Clinical Notes, Suggestions and New Instruments

PYOCYANEUS MENINGITIS

REVIEW OF THE LITERATURE AND REPORT OF AN ORIGINAL CASE

NATHAN SLUTSKY, M.D., AND PAUL MATLIN, M.D., BROOKLYN

We are taking this opportunity of reviewing the literature and presenting a case report of a comparatively frequent saprophyte which on occasion attains moderate virulence and invades the blood stream and nervous system with fatal sequelae.

The general surgeon, while not often troubled by the invasion of *Bacillus pyocyaneus*, encounters it frequently enough to recognize the greenish discoloration over a heretofore healthy granulating surface and may even anticipate it by the characteristic odor suggestive of wet musty hay arising from the dressings. A few applications of boric acid rapidly eradicate the invasion and hence cause no undue concern.

The genito-urinary surgeon meets this organism with more frequency, for the urine appears to be an excellent culture medium. Weiss¹ claims an incidence of 25 per cent following pyelotomy.

Scott² in 1929, while investigating the rigors attendant on instrumentation of the genito-urinary tract, took blood cultures on patients suffering chills and fever above 102 F. Over a period of two years he was able to obtain eighty-two positive cultures, recovering *Bacillus pyocyaneus* three times. This bacteremia was transitory with no sequelae. Hyman and Edelman³ in 1932, repeating this procedure, obtained sixty-three positive cultures and one case of pyocyaneus bacteremia following cystoscopy in a case of renal neoplasm. Barrington and Wright⁴ report twelve positive cultures in a series of eighty-eight cases, with one case of *Bacillus pyocyaneus*. Powers,⁵ in a series of thirty cases, recovered this organism from the blood on one occasion. Ewell⁶ reports a case of pyocyaneus bacteremia following pyelonephritis and prostatic abscess with subsequent death. Fish and his associates⁷ report a case of acute bacterial endocarditis in a man aged 71 after repeated catheterization and suprapubic prostatectomy. He also mentions four similar cases from the German literature.

In 1936 Florence Evans⁸ reviewed the literature on meningitis due to *Bacillus pyocyaneus* and reported a total of forty-two cases, including three of her own. This series included six cases in which there were meningeal symptoms, but no organisms could be recovered from the spinal canal. There were fourteen cases due to direct trauma (spinal tap, injury and the like), four cases of otitic origin and eighteen cases of pyocyaneus meningitis following systemic infection. Of these

1. Weiss: Personal communication to the authors.

2. Scott, W. W.: J. Urol. 21: 527 (May) 1929.

3. Hyman, A., and Edelman, L.: J. Urol. 28: 173 (Aug.) 1932.

4. Barrington, F. J. E., and Wright, H. D.: J. Path. & Bact. 33: 871 (Oct.) 1930.

5. Powers, J. H.: New York State J. Med. 36: 323 (March 1) 1936.

6. Ewell, G. H.: Urol. & Cutan. Rev. 40: 697 (Oct.) 1936.

7. Fish, G. W.; Hand, M. M., and Keim, W. F., Jr.: Am. J. Path. 13: 121 (Jan.) 1937.

8. Evans, Florence: M. Rec. 144: 111 (Aug. 5) 1936.

eighteen cases fifteen terminated fatally, a mortality of 83 per cent. Since then, Shrewsbury⁹ has reported a case following spinal tap with recovery after repeated drainage. Roberts and Belsey¹⁰ report a case of tuberculous empyema with secondary invasion by *Bacillus pyocyaneus*. Surgical drainage was instituted and on this there followed a meningitis from which the pyocyaneus could be recovered. There was recovery after symptomatic treatment.

REPORT OF CASE

B. B., a woman aged 49, white, admitted to the Beth Moses Hospital Jan. 8, 1937, complained chiefly of pain in the right lumbar region and right upper quadrant for the past three years. The pain was colicky and radiated to both shoulders and downward toward the symphysis. The patient had repeated attacks of this nature and noticed frank blood in the urine on each occasion, accompanied by dysuria. There were no chills or fever. The past personal and family histories were irrelevant.

The patient was examined with a cystoscope and x-rays by one of us prior to admission to the hospital. A large calculus occupying the pelvis and lower calix of the right kidney was visualized. The urine obtained from this side by ureteral catheterization revealed many leukocytes in clumps. Kidney function (by the indigo carmine test) was normal on both sides.

On admission the patient was acutely ill. The only gross abnormalities were spasm in the right upper quadrant and the presence of the Murphy sign on the right side. The blood pressure was 130 mm. of mercury systolic and 80 diastolic. The temperature, pulse and respiratory rates were normal. There were 7,200 white blood cells with 65 per cent polymorphonuclear leukocytes. The urine was cloudy and acid, had a specific gravity of 1.015 and contained no albumin or sugar. There were many erythrocytes and leukocytes present, the latter in clumps.

On January 9 a pyelolithotomy was performed under cyclopropane anesthesia. The stone was removed from the pelvis and two small catheters were inserted into the opening. The following day the temperature rose to 104.2 F., the pulse to 104 per minute and the respiratory rate to 26 per minute. January 11 the temperature was 104.8 F. and the pulse 96. With this discrepancy between pulse and temperature, meningitis was of course suspected. The sensorium was clear but there was evidence of some nuchal rigidity. Inspection of the wound showed a slight greenish discoloration at the drainage tubes with a definite odor of musty hay. *Bacillus pyocyaneus* was obtained on culture. On the third day after operation there was no improvement. The temperature was 104.6 F. and the pulse 90. Blood culture taken revealed *Bacillus pyocyaneus* in the broth; there was no growth on the plates. The urine showed 2 plus albumin with an occasional white cell. The patient's condition remained essentially the same until the sixth day, when a herpetic eruption of the buttocks became evident. On the seventh day the patient became irrational and incontinent and there was moderate distention. Nuchal rigidity was marked and Kernig's sign was present. The patient was given a transfusion. A spinal tap yielded 12 cc. of a light green cloudy fluid under increased tension. There were 4,300 mononuclear cells present and the culture revealed *Bacillus pyocyaneus* in pure growth. January 18, eight days after the operation, there was evidence of a right hemiplegia, speech defect, ankle clonus on the right side and the already noted nuchal rigidity and Kernig sign. The temperature was 102.5 F., the pulse 112 and the respiratory rate 32. Another spinal tap was performed; 10 cc. of a green cloudy fluid under increased pressure was withdrawn. The same organisms were recovered. The patient suffered an attack of pulmonary edema with marked dyspnea. Fifty cc. of 50 per cent dextrose was given intravenously with marked beneficial effect. Bacteriophage was obtained and a course of intravenous therapy instituted. At 4:20 a. m., after 50 cc. of the bacteriophage had been given in graduated increasing doses, the patient suffered a severe chill lasting eight minutes (the desired reaction). The temperature was 104 F., the pulse 120 and the respiratory rate 52.

Another spinal tap was performed, and after withdrawal of 15 cc. of green cloudy fluid 2 cc. of bacteriophage in 8 cc. of saline solution was injected. The patient died on the tenth day after the operation with a complete right hemiplegia present at the time of death.

SUMMARY

In the original case here presented *Bacillus pyocyaneus* was obtained from the wound following a pyelolithotomy for calculus; bacteremia ensued and this organism was recovered from the blood stream; meningitis followed and the same organism was again recovered. From the clinical picture one might justifiably conclude that a solitary cortical abscess had developed with a complete right hemiplegia and motor aphasia as focalizing signs.

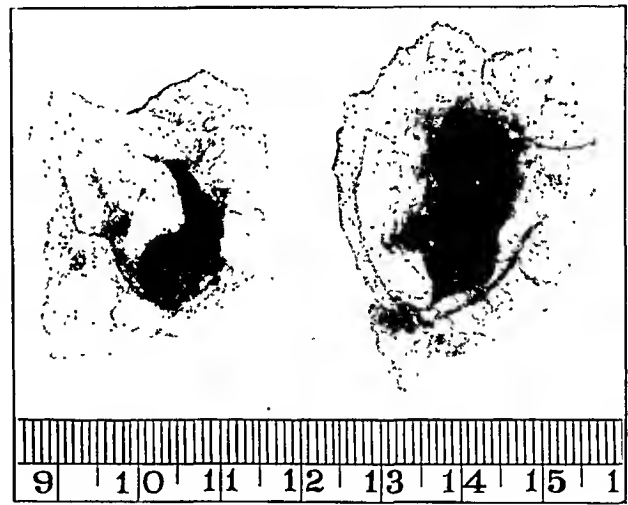
1602 Avenue H.

PILONIDAL SINUSES IN IDENTICAL TWINS

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CHICAGO

Search of the literature reveals only one instance of the occurrence of pilonidal cysts and sinuses in identical twins.¹ The following report of such an occurrence is interesting also because of the appearance of the symptoms at approximately the same time in the two twins:

I. K. and J. K., identical twins, aged 23, in December 1935, within a period of a few days, each noticed a symptom free lump at the end of the spine. One year later, again within a



Pilonidal sinuses removed from identical twins.

few days, both lumps began to drain very slightly. The drainage was serous and in one patient remained so. The other patient had a mild inflammatory reaction in March 1937 with some soreness for several days.

Examination revealed in each case two small openings in the midline over the coccyx into which probes could be inserted about 2 cm. and from which there escaped a small amount of serous drainage.

Both cysts were removed May 3, 1937. They were rather small but typical. The ensuing cavities were closed primarily. One healed by primary union; the other, which previously had been inflamed, drained some serum for a few days but was completely healed within three weeks.

The significance of the occurrence of this developmental defect in identical twins is a question. Whether it is purely coincidental or whether the "anlage" for the defective development is present in the ovum before it splits to form twins, we do not know.

104 South Michigan Avenue.

9. Shrewsbury, J. F. D.: Brit. M. J. 1:280 (Feb. 17) 1934.
10. Roberts, J. E. H., and Belsey, R. H. R.: Brit. M. J. 2:1276 (Dec. 25) 1937.

From the Surgical Service of Michael Reese Hospital.
1. Meckling, C. C.: Congenital Proctologic Defects in Twins, J. A. M. A. 102:367 (Feb. 3) 1934.

duced. Serum may be given in the presence of purulent complications; then it is impossible to neutralize the antigen present and the collections of purulent material keep pneumococci inaccessible to the antibodies so that the pneumococci continue to multiply. Surgical evacuation is then required in addition. Serum therapy and other specific therapy fail when the pneumococcal infection places an insupportable load on an already weakened mechanism, so that the breaking point is reached and death occurs, as with degeneration of heart, liver or kidney. The exudate which collects in response to the pneumococcus may exert fatal pressure, as in meningitis. Finally, death may be due to reduction of functioning pulmonary tissue, to dehydration or azotemia from loss of chlorides, to other infections and to a number of other circumstances.

Antibody can be measured. The amount of antibody required for neutralization of a given amount of antigen or soluble carbohydrate is measurable, so that the relative strengths of serums can be compared, either outside the body or in an animal. The protection of mice

of early and not too severe involvement in which the organisms are not too virulent. This amount is inferred from the fact that there are, in an average person, approximately 10 liters of blood. If 100,000 units of antibody is diluted in 10,000 cc. of blood, there will be 10 units to each cubic centimeter. Some patients will

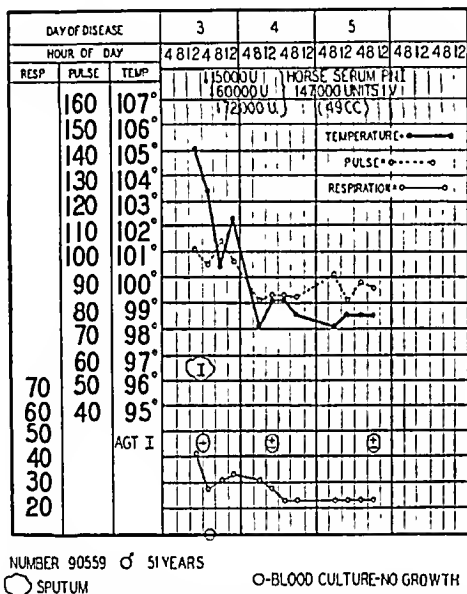


Fig. 3.—Type I pneumonia treated with 49 cc. of refined and concentrated antipneumococcus horse serum in three doses in four hours. On the third day, agglutinins which were negative became positive.

against organisms is the accepted value, and for commercial serums its use is required by the National Institute of Health. The titration of serum against a control is shown in figure 2. Antibodies may be measured by the nitrogen united with a known amount of soluble carbohydrate. Antibodies may also be gaged by the amount of capsule swelling they cause under standard conditions. Serums should be clinically tested for reactions under controlled conditions before they are released to practitioners.

The variables present in any given case make an exact estimate of the required dose difficult. The organisms may be few or many, and they may differ in virulence and in capacity to produce soluble carbohydrate. The ability of patients to respond with antibody and the amount of antigen invading organisms liberate are variable. The lung blood barrier produced by local defenses may be ineffectual.

Because it has been observed that there are from 10 to 20 units of antibody in many spontaneously recovering patients, it is probable that 100,000 units in an adult is the amount required to induce a cure in most cases

require much more than this. This is especially true of patients who have bacteremia, who suffer from infection due to pneumococci of type II, III or VII or who have several lobes involved and are seen late in the course of the disease, when much antigen or carbohydrate is present. Because the maximum concentration of antibody is required immediately, it is necessary to give serum intravenously in the shortest possible time consistent with the avoidance of chills and other reactions. Two thirds of the last eighty patients treated with serum at Harlem Hospital received between 100,000 and 300,000 units of antibody, but more was required by the others.

It is well to give a probative dose to determine the reaction of the patient to serum and thus avoid severe reactions, and then to give the remaining serum as quickly as possible. I recommend injection of the serum at intervals of one or two hours into the tube of a running infusion of saline solution and 5 per cent dextrose in progressively increasing doses as illustrated in figure 3. Only with infants is it advisable to give serum intramuscularly. This is an extravagant method,

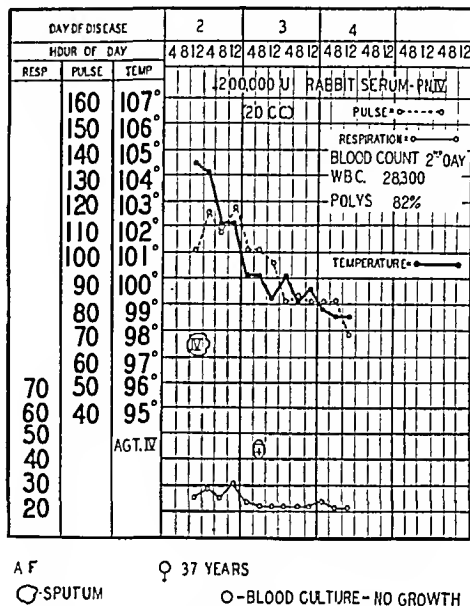


Fig. 4.—Type IV pneumonia treated with 20 cc. of refined and concentrated rabbit serum in a single dose.

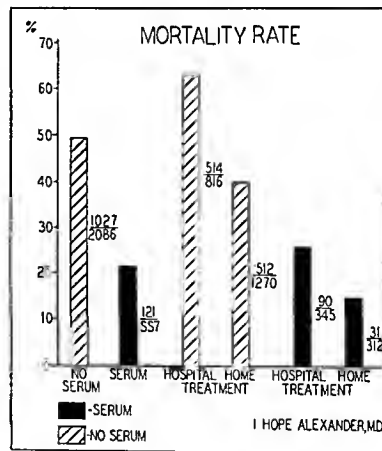


Fig. 5.—The effect of serum therapy on the mortality rate; contrast between hospital and home treatment in the years 1937 and 1938, in the department of public health, Pittsburgh.

because an infant must receive, through the muscle, approximately the same dose as would be adequate for an adult. Figure 4 shows the results of a single dose of refined and concentrated rabbit serum.

At the present time, serums are available for all the types of pneumococci established by Cooper and her co-workers. Serum will have to be prepared for several strains which were not differentiated at the time of her report and for some which cross with the strains segregated and numbered by her. There are undoubtedly types of organisms and possibly conditions of soluble specific substance with which union with antibody is less ready than usual and for which extremely large amount of antibody may be required. The conditions which make for prompt union of antibody and soluble carbohydrate are still not entirely known. With

Serotherapy Versus Chemotherapy

Serotherapy Fortifies the Patient

Advantages	Disadvantages
Neutralizes capsular substance	Is type specific
Sensitizes pneumococci for phagocytosis and lysis	There are resistant types
Reduces virulence	Must be used intravenously
	May cause reactions:
	Anaphylactic
	Thermal
	Serum sickness
	Cost is high

Chemotherapy Depresses the Organisms

Advantages	Disadvantages
Is effective for both pneumococci and streptococci	There are resistant strains
May be used orally	Organisms survive
Is effective for meningitis	There is irregular absorption and concentration
Cost is low	Toxicity may develop
	There may develop symptoms referable to the
	Gastrointestinal tract
	Liver
	Central nervous system
	Skin
	Urinary tract
	There may develop:
	Hemolytic anemia
	Agranulocytosis
	Sulfapyridine sickness

Combination of Drug and Serum

Enhances effectiveness of both agents; supplement drug with serum

patients who have large amounts of soluble carbohydrate already in the blood or in whom the pneumococci have invaded the blood and are in a rapidly multiplying phase, serum will fail unless huge amounts of serum are promptly given; such patients are benefited by the administration of serum. With these patients other methods, such as a chemotherapeutic attack on the pneumococci, by depressing the production of soluble specific substance, may be an important adjuvant.

The clinical results of the administration of serum have been amply demonstrated not only in patients treated promptly in the first few days of the disease but also in those for whom treatment has been delayed. It has been shown that intensity of therapy is a greater factor in securing recovery than the time when serum is administered.

The influence of serum on the course of pneumococcal pneumonia is seen in the regular fall of pulse rate and of temperature as soon as a sufficient amount of anti-serum has been injected. The patient is unpoisoned and frequently is reading the paper on the day after an injection. Bacteremia can no longer be demonstrated, even in cases of heavy invasion. A crisis has been induced. The temperature became normal in twenty-four hours in sixty-eight of the last eighty patients treated with serum. Patients with bacteremia usually required forty-eight hours. But, since a critical fall of

temperature may occur in patients without specific therapy, it is necessary to present proof of benefit. Termination of pneumonia occurs even in cases of early involvement in direct time relation with the administration of the serum instead of at the times expected from observation of the disease unmodified by specific therapy.

With all the variables in patients and in invading organisms, how shall one determine whether lives are saved by using serum? Comparing the results in patients treated with serum and those from whom it is withheld seems an appropriate method. One must, however, compare only those patients in each series who had the same chances of recovery. This involves comparing similar age group, similar types of pneumonia, illnesses of similar duration and illnesses of similar severity as measured by bacteremia. If one applies these standards, one must have sufficient patients in each group so that the difference in death rate will be of such a magnitude that it can be said, with reasonable certainty, that the lowered death rate is due to the difference in therapy and not to a chance difference in the groups of patients selected for comparison. This evidence has been provided in the case of many types of pneumonia and for many age groups.

Such figures from various sources show what has been accomplished with serum therapy. In Massachusetts, according to Dr. Arthur P. Long of the Antitoxin and Vaccine Laboratory of the Massachusetts Department of Public Health, from July 1, 1938, to April 4, 1939, there were 199 patients under 60 years of age, with fourteen deaths, or a mortality of 7 per cent. In the Boston City Hospital, Dr. Maxwell Finland, using both horse and rabbit serum, lost no patients under 40 years of age. There were thirteen patients with bacteremia, with three deaths, a mortality of 23 per cent. The excellent results achieved in Pittsburgh, reported by Dr. I. Hope Alexander, in which the death rate was halved by the use of serum, are shown in figure 5.

Because at the present time chemotherapy, represented by sulfapyridine, offers assistance in the therapy of the pneumonias, it is important to contrast the advantages and disadvantages of the two types of therapy, as in the accompanying tabulation.

Serotherapy, which primarily fortifies the patient, has these advantages:

Antibody neutralizes capsular substance which either is already present in the body or develops during several days when sufficient serum is given.

Pneumococci are not dissolved or phagocyted unless they are sensitized by antibody. This may be autogenous or injected when vicariously produced in horses or rabbits.

Pneumococci have their virulence reduced when grown in the presence of antibody.

The disadvantages are as follows:

Serum administered must be specific for the infecting type.

Some types, especially those which produce a very large amount of antibody, such as pneumococcus type III, are resistant to serum.

Serum must be given intravenously and requires devotion on the part of the physician.

Though unfavorable reactions may be forestalled, there is always the possibility of anaphylaxis, thermal reactions and serum sickness.

Serum therapy is expensive.

Determination of the ultimate places to be assigned serum therapy and chemotherapy must wait on further studies.

62 West Eighty-Seventh Street.

CHEMOTHERAPY OF PNEUMOCOCCIC PNEUMONIA

CLINICAL LECTURE AT ST. LOUIS SESSION

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The ideal chemotherapeutic agent may be defined as one which, by inhibiting certain vital functions of the invading micro-organism or neutralizing its products, terminates the disease without causing any toxic effect on the host. This definition presupposes that the point of attack must be on a specific function or structure unique to the micro-organism, so that the tissues and organs of the host escape the toxic action.

Ethylhydrocupreine (optochin) was introduced by Morgenroth and Levy¹ in 1911 for the treatment of pneumococcal infections, after study of numerous other quinine derivatives. A good deal of enthusiasm followed the early experimental results and ethylhydrocupreine was used in the treatment of human pneumonia. However, the observations of Moore and Chesney² led to the conclusion that the use of ethylhydrocupreine in the treatment of pneumonia could not be recommended since it was impossible to administer an amount sufficient to achieve an effective concentration in the blood stream without subjecting the patient to the danger of toxic effects, of which amblyopia was the most frequent. Other quinine derivatives have since been recommended but up to the present time not one has had widespread clinical use.

The report by Domagk³ in 1935 of the therapeutic action of a sulfonamide compound on infections due to the hemolytic streptococcus led to the use of related compounds in the treatment of pneumococcal infections. Sulfanilamide was the first of these derivatives to be extensively used but its effect on experimental pneumococcal infections was found to be relatively small.

The most promising sulfonamide derivative, sulfapyridine, was introduced in England in 1938. The first report by Whitby⁴ on the use of this drug in experimental pneumococcal infections of mice showed such striking results that little time was lost in applying the experimental results directly in the treatment of pneumococcal infections of man. It is difficult to say at present how much the early enthusiasms may have to be tempered in the light of further experimental and clinical observations. However, it seems quite certain that the use of sulfapyridine is a distinct advance in the therapy of pneumococcal infections.

MODE OF ACTION

The mode of action of the sulfonamide group of drugs on different species of bacteria is poorly understood. Sulfanilamide exerts a bacteriostatic effect on susceptible micro-organisms, but its mode of action has not been fully elucidated. It has been postulated that sulfanilamide achieves its bacteriostatic effect by the

inhibition of certain enzyme systems of the bacterium, thus interfering with cell nutrition. On the other hand, it has been suggested that the drug combines with some essential growth substance, which then ceases to be available to the micro-organism. A somewhat different hypothesis has been advanced by Locke and his associates⁵ based on the observation that sulfanilamide when oxidized by ultraviolet rays exerts an anticalase effect. From this point of view the action of sulfanilamide is indirect, depending on the accumulation of hydrogen peroxide when catalase is inhibited. In the case of micro-organisms such as the pneumococcus or the hemolytic streptococcus, which do not possess demonstrable catalase activity, the bacteriostatic effect would then depend on the inhibition of catalase in the tissues and fluids of the host or in the medium in which the organisms are growing, thus permitting hydrogen peroxide to accumulate and exert a bacteriostatic effect. While this may be one of the systems affected by sulfanilamide or sulfapyridine, it would not appear to be the sole one so inhibited, since sulfapyridine will restrain the growth of pneumococci in a medium which does not contain demonstrable catalase.

DEVELOPMENT OF "SULFAPYRIDINE FASTNESS" IN VITRO

The action of sulfapyridine on the pneumococcus was believed at first to be on the capsule.⁶ The theory was advanced that in the presence of the drug the pneumococcus became deprived of its capsule and, denuded of this protective covering, became a ready prey for the phagocytes. This view has now been generally abandoned. We have been unable to confirm the observation that pneumococci in the sputum of patients treated with sulfapyridine lose their capsules and become avirulent. Indeed, we⁷ have shown that pneumococcus type I can be adapted to growth in increasing concentrations of sulfapyridine until finally it will multiply freely in concentrations of the drug which inhibit the growth of organisms not so accustomed. Throughout the procedure of adaptation the pneumococcus retains not only its type-specific capsule but its virulence as well. This "drug-fast" strain, unlike the parent strain from which it was derived, does not respond to the therapeutic effect of sulfapyridine in experimental infections. However, the "sulfapyridine-fast" strain is fully susceptible to the therapeutic action of type-specific antipneumococcus serum. In table 1 are shown the results of treatment with sulfapyridine and specific antiserum on the experimental infections of mice with the "sulfapyridine-fast" and parent strains of pneumococcus type I.

From the results shown in table 1 it can be seen that, although mice are protected by type I serum against fatal infection with both the parent and "drug-fast" strains, sulfapyridine has no curative effect on infections with a drug-fast strain. The acquisition of "sulfapyridine fastness" by a strain of pneumococcus type I takes place without alteration in the morphology, type specificity or virulence of the organism. "Sulfapyridine fastness" acquired by pneumococcus type I under these circumstances is relatively permanent.

From the Hospital of Rockefeller Institute for Medical Research.
Read in the Panel Discussion on Pneumonia, Medical Division, General Scientific Meetings, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

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4. Whitby, L. E. H.: Chemotherapy of Pneumococcal and Other Infections with 2(p-Amino-Benzene-sulfonamido) Pyridine, *Lancet* **1**: 1210 (May 28) 1938.

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After forty serial transfers in broth not containing the drug, "fastness" is retained. Similarly "fastness" is still present after fifteen passages in untreated mice.

DEVELOPMENT OF "SULFAPYRIDINE FASTNESS" IN VIVO

More recently we have been able to demonstrate that fastness to sulfapyridine may be acquired by pneumococcus type I in the animal body as well as during cultivation in the test tube. Mice were infected with pneumococcus type I and treated with sulfapyridine in dosage sufficient to prolong life but insufficient to bring about recovery. After three passages through mice which were treated in this manner, the strain of pneumococcus was found to be "sulfapyridine fast." Mice infected with the strain, rendered "drug fast" in vivo, died despite treatment with sulfapyridine in dosage sufficient to bring about recovery of all mice in the control group infected with the parent strain of pneumococcus type I.

Variations in susceptibility to the bacteriostatic action of sulfapyridine have been noted by MacLean, Rogers and Fleming.⁸ These investigators were able to show in addition that a strain of pneumococcus type VIII which was relatively insensitive to the action of sulfapyridine could be made even more insensitive to the drug by repeated passage of the strain in mice treated with sulfapyridine.

METABOLISM OF "SULFAPYRIDINE-FAST" AND PARENT STRAINS OF PNEUMOCOCCUS TYPE I

Studies of the metabolism of the "sulfapyridine-fast" and parent strains of pneumococcus type I have revealed certain differences. In aerobic cultures the parent strain of pneumococcus produces large amounts of hydrogen peroxide,⁹ whereas the "sulfapyridine-fast" strain forms little or no hydrogen peroxide under similar condi-

TABLE 1.—Results of Treatment with Sulfapyridine or Type I Serum of Mice Infected with Parent Strain and "Sulfapyridine-Fast" Strain of Pneumococcus Type I*

Treatment	Infecting Dose,† Cc. Culture	Result	
		Parent Strain	"Sulfapyridine-Fast" Strain
Type I antipneumococcus rabbit serum unconcentrated 0.2 cc.	10 ⁻²	SSSS†	SSSS
	10 ⁻³	SSSS	SSSS
	10 ⁻⁴	SSSS	SSSS
Sulfapyridine 4 doses of 30 mg. each	10 ⁻²	SSS	DDD
		SSS	DDD
		SSS	DDS

* All mice were infected intraperitoneally. Sulfapyridine was administered by stomach tube in 30 mg. doses. The first dose was given immediately following infection, the second five hours later. Subsequent doses of 30 mg. were given at daily intervals. The serum used was type I unconcentrated antipneumococcus rabbit serum. Serum and culture were mixed in the syringe immediately before intraperitoneal injection.

† The virulence of both cultures was such that untreated mice infected with 10⁻⁷ or 10⁻⁸ cc. died within forty-eight hours.

‡ S indicates survival; D indicates death.

tions.¹⁰ The production of hydrogen peroxide by cultures of pneumococcus may be determined readily by cultivating the organisms on the surface of blood agar which contains benzidine, according to the technic

described by Penfold.¹¹ Strains which produce large amounts of peroxide form jet-black colonies, whereas strains forming small amounts of peroxide cause much less discoloration of the medium.

Moreover, we¹⁰ have recently found that the "sulfapyridine-fast" strain has lost in great part its ability to dehydrogenate certain three-carbon com-

TABLE 2.—Dehydrogenase Activity of Parent and "Sulfapyridine-Fast" Strains of Pneumococcus Type I*

Substrate Final Concentration	Parent Strain		"Sulfapyridine-Fast" Strain	
	Without Sulfapyridine	Sulfapyridine 1:8,000‡	Without Sulfapyridine	Sulfapyridine 1:8,000
Dextrose M/140.....	++++†	++++	++++	++++
Glycerol M/80.....	++++	+	—	—
Sodium pyruvate M/80.....	++++	+	—	—
Sodium lactate M/80.....	++++	—	—	—
No substrate.....	—	—	—	—

* Each tube contained 0.5 cc. of 0.002 M methylene blue in M/20 phosphate buffer pH 7.6; 0.1 cc. of plain broth as a source of coenzymes; 0.5 cc. of the appropriate substrate; 1.0 cc. of the suspension of pneumococcus cells. The final volume was brought to 4.0 cc. in each case by the addition of M/20 phosphate buffer pH 7.6. The tubes were sealed with a layer of petrolatum and incubated at 37 C.

† ++++ indicates complete reduction of methylene blue after one hour at 37 C. — Indicates no reduction of methylene blue.

‡ One cc. of a neutral solution of sulfapyridine 1:2,000 added as indicated, making a final concentration of 1:8,000.

pounds (glycerol, pyruvate, lactate). The ability to utilize dextrose remains undiminished.

The technic used in demonstrating the differences in the metabolism of the parent and "sulfapyridine-fast" strains was the estimation of the reduction of methylene blue by "resting" cell suspensions¹² of the microorganisms in the presence of the various substrates, as shown in table 2.

In extension of these results we have observed that sulfapyridine added directly to cell suspensions of the parent strain of pneumococcus type I inhibits the dehydrogenation of these same substances. Thus it would appear that the bacteriostatic effect of sulfapyridine on the pneumococcus may be due in part to inhibition of an enzyme or enzymes concerned in the utilization by the bacterial cells of these substrates—glycerol, pyruvate and lactate.

EFFECT IN THE ANIMAL BODY

In the animal body sulfapyridine exerts a bacteriostatic effect on the pneumococcus¹³—a reflection of the effect which occurs in the test tube. If one considers the course of events in recovery from pneumococcal pneumonia it will be seen that in many cases bacteriostasis may be all that is required for a favorable outcome to occur. Spontaneous recovery from pneumococcal pneumonia is usually associated with the development by the host of specific antibodies. At the risk of oversimplification it may be said that, if the pneumococcus is able to multiply more rapidly than the patient is able to produce specific antibody, the patient will die. However, if a bacteriostatic agent is used, the organisms multiply more slowly while the rate of antibody production is undiminished; hence the acute course of the disease may be shortened. There is no good evidence at present that the body can rid itself of virulent pneumococci by phagocytosis unless the organisms are first

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9. MacLeod, J. W., and Gordon, J.: Production of Hydrogen Peroxide by Bacteria, *Biochem. J.* 16: 499, 1922.

10. MacLeod, C. M.: Metabolism of "Sulfapyridine-Fast" and Parent Strains of Pneumococcus Type I, *Proc. Soc. Exper. Biol. & Med.* 41: 215, 1939.

11. Penfold, W. J.: The Action of the Pneumococcus on Aromatic Amino Bodies, *M. J. Australia* 2: 120 (July 29) 1922.

12. Quastel, J. H., and Whetham, M. D.: Dehydrogenations Produced by Resting Bacteria, *Biochem. J.* 19: 520, 1925. Cook, R. P., and Stephenson, M. D.: The Aerobic Oxidation of Glucose and Its Fermentation Products in Its Relation to the Viability of the Organism, *Biochem. J.* 22: 1368, 1928.

13. Whithy, L. E. H.: Chemotherapy of Bacterial Infections, *Lancet* 2: 1095 (Nov. 12) 1938.

sensitized by specific antibody. Even virulent pneumococci which have been killed by heat are not phagocytosed unless they are first sensitized.

If a particular strain of pneumococcus happens to be a good antigen in a certain host species, injection of the organisms of such a strain will cause a good antibody response. On the other hand, if the strain is a poor antigen the antibody response will be poor. This is illustrated by the antigenicity in the mouse of pneumococci types I and III. Type I is a good antigen, whereas type III is a relatively poor antigen. If groups of mice are infected intraperitoneally with 10^{-2} cc. of fully virulent broth culture of these strains and treated with sulfapyridine, the survival rate parallels in each case the immune response elicited by a single intraperitoneal injection of the same amount of heat-killed organisms of the respective strains in other groups of mice. The results of a series of such experiments are shown in table 3.

Mice injected with 10^{-2} cc. of culture of pneumococcus type I, and treated with six doses of 30 mg. each of sulfapyridine over a five day period, show a survival rate of from 95 to 100 per cent. Similarly, from 95 to 100 per cent of mice given a single intraperitoneal injection of 10^{-2} cc. of heat-killed organisms of the same culture showed active immunity when tested five days later by infecting intraperitoneally with 1,000 lethal doses of homologous culture.

In the case of pneumococcus type III a similar relationship was found to exist between the immune response and the survival rate following sulfapyridine therapy, although in this case both are very low. Ten per cent or less of mice survived which were infected with 10^{-2} cc. of culture and treated with the drug. The immunity induced in a comparable group of mice by a single injection of the same amount of heat-killed vaccine was of the same order.

It is also of great interest that, in this species of animal, treatment with sulfapyridine is necessary only for the period known to be required for the development of antibodies. Thus there appears to be a correlation not only between survival from infection and the antigenicity of the strain of pneumococcus but also between the time required for the host to develop anti-

TABLE 3.—Relation of Effectiveness of Sulfapyridine Therapy to Immunity Induced in Mice by Injection of Pneumococcus Vaccines

Pneumococcus Type	Infection with 10^{-2} Cc. Culture; Treated with Sulfapyridine; * per Cent Survival	Immunized with 10^{-2} Cc. Heat-Killed Culture;† No Sulfapyridine Given; per Cent Immune
Type I.....	95-100	95-100
Type III.....	0-10	0

* Mice were infected intraperitoneally. The virulence of both cultures was such that untreated mice infected with 10^{-2} or 10^{-3} cc. died within forty-eight hours. Treatment with sulfapyridine was carried out for five days, a total of 180 mg. of drug per mouse being given.

† Single immunizing dose of heat-killed organisms given intraperitoneally. Immunity tested five days later by infecting intraperitoneally with 1,000 lethal doses of homologous culture.

bodies and the length of time necessary to continue sulfapyridine treatment.

In his original communication Whitby⁴ pointed out that mice which recovered following infection with pneumococcus type I and treatment with sulfapyridine are immune to reinfection with the homologous organism, and we have confirmed this observation. Similarly Larson and his co-workers¹⁴ have observed the same

phenomenon in rabbits which recovered following intradermal infection with pneumococcus type II and treatment with sulfapyridine. McIntosh and Whitby¹⁵ have extended Whitby's earlier observations and conclude that administration of the drug to mice does not affect "the quality, quantity or speed of production of recognized specific antibodies."

TABLE 4.—Synergistic Effect of Sulfapyridine and Antipneumococcus Serum in Experimental Infection of Mice with Pneumococcus Type III *

Infecting Dose, Cc. of Culture	Amount of Serum, Cc.	Sulfapyridine Number of Doses	Number of Mice Infected	Number of Mice Surviving	Percentage Survival
10^{-2}	0	2	20	1	5
10^{-2}	0.05	0	20	0	0
10^{-2}	0.05	2	20	12	60

* Unconcentrated type III antipneumococcus rabbit serum and culture were mixed in the syringe immediately before intraperitoneal injection. The administration of sulfapyridine was as described in table 1.

SYNERGISM OF ANTIPNEUMOCOCCUS SERUM AND SULFAPYRIDINE

Since the participation of the active immune mechanism appears to play a considerable role in the successful action of sulfapyridine on experimental infections with the pneumococcus, it was of interest to determine whether synergism exists between the drug and the passive immunity conferred by the administration of specific antiserum.

Groups of mice were infected with pneumococcus type III and treated respectively with sulfapyridine alone, serum alone and the same amount of the two agents in combination. The dosage of serum and sulfapyridine when used alone was such that little or no protection was afforded against the infecting inoculum. The protocol of a typical experiment is shown in table 4.

The results presented in table 4 make it clear that type III antipneumococcus serum and sulfapyridine are synergistic, since amounts of each agent which used singly exert little or no protective action afforded protection to 60 per cent of mice when used in combination. The demonstration of synergism of the two agents in the treatment of infections due to pneumococcus type III is of particular interest, since the protective action of either agent alone in experimental infections of mice is distinctly less than that which occurs in infection with pneumococci of other types.

CLINICAL USE OF SULFAPYRIDINE

The numerous reports concerning the therapeutic effect of sulfapyridine in pneumococcal pneumonia have been uniformly favorable. Mortality rates of from 2 to 10 per cent in series of cases reported from various parts of the world indicate that the drug is effective in reducing the mortality rate. However, insufficient attention has been paid to the toxic effects of this chemotherapeutic agent.

Nausea and vomiting are frequent accompaniments of the administration of sulfapyridine. These reactions are unrelated to the dosage of drug or to the blood level. Since vomiting occurs in individuals to whom the drug has been administered parenterally, the effect would appear to be central, in addition to a possible local action on the stomach.¹⁶ Morbilliform skin rashes have

14. Larson, W. P.; Bieter, R. N., and Levine, Milton: Protective Action of Sulfapyridine in Rabbits Infected with Pneumococci, *Proc. Soc. Exper. Biol. & Med.* 40: 703 (April) 1939.

15. McIntosh, James, and Whitby, L. E. H.: The Mode of Action of Drugs of the Sulfonamide Group, *Lancet* 1: 431 (Feb. 25) 1939.

16. Marshall, E. K., Jr., and Long, P. H.: Sodium Sulfapyridine, *J. A. M. A.* 112: 671 (April 29) 1939.

been reported, as well as numbness and tingling of the extremities.¹⁷ Cyanosis due to methemoglobinemia occurs, particularly if high blood levels of the drug are attained.

More serious toxic manifestations may appear, however, involving particularly the hemopoietic system and the urinary tract.

EFFECT OF SULFAPYRIDINE ON HEMOPOIETIC SYSTEM

The occurrence of acute hemolytic anemia in patients receiving sulfanilamide has been the subject of many reports, but as yet there is little information available concerning increased blood destruction in patients receiving sulfapyridine. During the routine administration of sulfapyridine to patients with pneumonia, hemolytic anemia occurred in two instances; consequently a study of the effect of this drug on hemolysis was undertaken.¹⁸ Estimation of the total urinary and fecal excretion of urobilinogen was used as an index of the rate of hemolysis, since by this means increases in the rate of blood destruction may be observed which might escape detection if only routine clinical procedures are used.

Of the twenty-six patients with pneumonia for whom estimations of urobilinogen excretion were made, six did not receive sulfapyridine and in none of these was there an increase in the excretion of urobilinogen. Twenty patients received sulfapyridine in total dosage varying between 4.5 and 81 Gm., and in eight of these the excretion of urobilinogen in stools and urine was increased from one and one-half to five times the normal amount. Acute hemolytic anemia occurred in three of these patients. However, in the twelve other patients who received sulfapyridine, the urobilinogen excretion was normal or only slightly increased. The total dosage of drug administered to patients in the latter group tended to be less than that given to patients who showed increased urobilinogen excretion.

Increased blood destruction does not appear to be a usual accompaniment of the acute infectious process itself, since in eighteen of the twenty-six patients studied the excretion of urobilinogen was within normal limits. The evidence indicates that hemolysis was due to sulfapyridine rather than to pneumonia itself and that increased blood destruction occurs more frequently following the administration of this drug than would be suspected unless special methods for its detection are used.

The occurrence of granulocytopenia in patients receiving sulfapyridine has been reported.¹⁹ This toxic effect occurs less frequently than hemolysis but is additional reason for making repeated blood examinations on patients who receive the drug.

EFFECT OF SULFAPYRIDINE ON THE URINARY TRACT

The solubility of sulfapyridine is less than that of sulfanilamide. This may account in part for the occasionally erratic absorption of the former drug and

also for irregularities in its excretion. Antopol and Robinson²⁰ have described the occurrence of calculus formation in the urinary tract of monkeys fed sulfapyridine. The same complication occurred also in rats and rabbits, although in the case of the last two species much larger dosage was required. Renal calculi have been observed likewise by Gross, Cooper and Lewis²¹ in rats that were fed sulfapyridine. The calculi described by both groups of investigators were found to be composed chiefly of the acetyl derivative of sulfapyridine.

Hematuria, aside from that occurring during hemorrhagic Bright's disease, has been observed in only two instances during the course of sulfapyridine therapy in this hospital. One of these patients, a man aged 21, suffered from typical renal colic with hematuria shortly after discontinuing the drug. A calculus was not visualized by x-ray examination and the symptoms gradually disappeared. According to Antopol and Robinson²⁰ the concretions of sulfapyridine and its acetylated derivative which occur in the urinary tract of monkeys are not usually seen in roentgenograms although they may become radiopaque because of overlayering with calcium salts.

Southworth and Cook²² have reported the occurrence of azotemia in two of three patients who developed hematuria during sulfapyridine administration. In addition there was acute abdominal pain, which was believed to be of renal and ureteral origin. On cessation of drug therapy and with the forcing of fluids, these signs and symptoms cleared rapidly.

Depression of renal function may occur, however, in the absence of hematuria. In two patients treated with sulfapyridine we have observed a temporary depression of the urea clearance to critical levels associated with azotemia, although hematuria was not present in either instance. With discontinuance of drug administration there was a rapid improvement in kidney function with disappearance of azotemia, and complete recovery apparently ensued. The studies of Farr and Abernethy²³ on renal physiology in lobar pneumonia indicate that depression of kidney function is not a usual accompaniment of this disease. Indeed, in the experience of these authors, patients below the age of 40 showed a marked elevation of the urea clearance during the acute phase of the disease, with persistence of the increased function for about one month. In the older age group the urea clearance showed little change.

The impression that the diminution of the urea clearance which occurred in the two cases noted may have been an expression of sulfapyridine toxicity is strengthened by the fact that acute hemorrhagic Bright's disease has developed in two other patients who received the drug.

REPORT OF CASES

CASE 1.—A white woman aged 25, whose past history was noncontributory, was admitted to the hospital on the eighth day following the onset of type III pneumococcus pneumonia. Consolidation of the right middle, right lower and left upper pulmonary lobes was present. The temperature was 104.2 F., pulse rate 132 and respiratory rate 40. The blood culture was sterile. The blood pressure was 112 systolic, 66 diastolic. Urinalysis gave normal results. Erythrocytes numbered 3,790,000, hemoglobin was 74 per cent, and leukocytes numbered

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20. Antopol, William, and Robinson, H.: Urolithiasis and Renal Pathology After Oral Administration of 2 (Sulfanilylamino) Pyridine (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* 40: 428 (March) 1939.
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22. Southworth, Hamilton, and Cook, Crispin: Hematuria, Abdominal Pain and Nitrogen Retention Associated with Sulfapyridine, *J. A. M. A.* 112: 1820 (May 6) 1939.
23. Farr, L. E., and Abernethy, T. J.: Renal Physiology in Lobar Pneumonia, *J. Clin. Investigation* 16: 421, 1937.

21,450, of which 84 per cent were polymorphonuclear cells. Sulfapyridine treatment was commenced shortly after admission, a total of 25 Gm. being given by mouth in the ensuing four days. Nausea and vomiting occurred after 4 Gm. of drug was given. The free sulfapyridine level in the blood was 12.6 mg. per hundred cubic centimeters thirty-six hours after the drug was started, and with this there was associated a marked diminution in the volume of urine excreted. The patient's temperature and pulse rate fell to normal on the day following admission and agglutinins for the type III pneumococcus were demonstrable in her blood serum. The skin reaction with the type III pneumococcus polysaccharide was positive at this time. The respiratory rate remained markedly elevated for four days after the crisis.

The urine output remained low despite a large intake of fluid, and with this there was associated pain across the upper abdominal area anteriorly, together with drowsiness and puffiness of the face. The blood pressure was 142 systolic, 88 diastolic. Urinalysis showed a trace of albumin, with an occasional granular cast but no red cells.

Five days after sulfapyridine was discontinued the blood level of the free drug was 0.8 mg. per hundred cubic centimeters and the urine showed 12.4 mg. The urine volume on this day was only 300 cc. The blood urea nitrogen level was 61 mg. Two days later the blood urea nitrogen had fallen to 33.6 mg. and urea clearance showed the kidney function to be 62 per cent of normal.

From the third to eighth hospital days the excretion of urobilinogen in stools and urine increased markedly and was associated with a fall in the red cell count and the hemoglobin level. On the twelfth hospital day the red blood cell count was 2,000,000 and hemoglobin 50 per cent; consequently a transfusion of 500 cc. of whole uncitrated blood was given. No reaction occurred during or after transfusion.

Edema of the face continued and the blood pressure rose to 162 systolic, 92 diastolic on the day before transfusion was given. The urea clearance was 54.8 per cent. The plasma albumin level was 2.69 mg. per hundred cubic centimeters and the plasma globulin 2.69 Gm. The urine showed 1.4 Gm. of protein excreted in twenty-four hours and large numbers of granular casts. Centrifuged specimens of urine showed only from 2 to 4 red blood cells per high power field.

Bilateral pleural effusion occurred with a rise in temperature and marked elevation of the pulse rate. Thoracentesis was performed on two occasions with the withdrawal of large amounts of sterile pleural fluid.

Diminution in urinary output persisted for twenty days, and was followed by a period of diuresis with disappearance of edema and upper abdominal pain. Four weeks after the onset of the renal complication the urea clearance had risen to 90 per cent of normal. The urine continued to show a trace of albumin and a few granular casts for one month after the urea clearance had returned to normal, but on discharge four months after admission the urine was normal. The blood pressure was 128 systolic, 78 diastolic. The red blood count was 4,840,000 and hemoglobin 96 per cent. The urea clearance was 96.3 per cent of normal.

CASE 2.—A white woman aged 43 was admitted to the hospital on the day following the acute onset of type III pneumococcus pneumonia which involved the left lower lobe. Her past history was noncontributory. The temperature was 104 F., pulse rate 120, respiratory rate 36. The blood culture was sterile. Erythrocytes numbered 4,200,000, hemoglobin 78 per cent, leukocytes 20,400, of which 90 per cent were polymorphonuclear cells. The blood pressure was 130 systolic, 68 diastolic. Urinalysis showed a faint trace of albumin. Sulfapyridine therapy was commenced shortly after admission, a total of 12 Gm. being given over a three day period. Nausea and vomiting occurred but were not severe. The highest blood level attained was 10.7 mg. per hundred cubic centimeters of the free drug on the last day of administration. In addition to sulfapyridine the patient was given 100 cc. of unconcentrated type III antipneumococcus rabbit serum twelve hours after admission. No toxic reaction due to serum occurred. The skin reaction with the type III polysaccharide, which was negative on admission, became positive following serum; consequently no further

antibody was given. Temperature, pulse and respiratory rates reached normal thirty-six hours after admission and remained normal for forty-eight hours, when the fever returned, associated with severe pleural pain. The administration of sulfapyridine was recommenced and between the seventh and eleventh days following admission an additional 13 Gm. of the drug was given. The skin reaction with the type III polysaccharide remained positive during this time. A massive left-sided pleural effusion occurred.

Examination of the urine on the day following withdrawal of sulfapyridine showed many granular casts as well as numerous red cells and pus cells. A heavy trace of albumin was present.

The patient complained of upper abdominal pain and began to show increasing pallor associated with a fall in the red blood count to 3,000,000 and of the hemoglobin level to 64 per cent. Concurrently edema of the face and extremities appeared and the output of urine diminished sharply. The patient's condition was fairly satisfactory until the twenty-fifth hospital day, when she suddenly developed acute cardiac failure with gallop rhythm and pulmonary edema, a markedly enlarged liver and rapidly increasing generalized edema. The urine showed 14.4 Gm. of protein per liter with numerous pus cells, red blood cells and granular casts. The urea clearance was 6.4 per cent of normal with blood urea nitrogen of 71.6 mg. per hundred cubic centimeters. The blood pressure was 184 systolic, 104 diastolic.

The patient's subsequent course was very stormy, owing to the mixed picture of heart failure and acute hemorrhagic Bright's disease with uremia. After two weeks, improvement in kidney function began to appear with a gradual loss of edema and improvement in the cardiac condition.

Prolonged convalescence was necessary, but after three months the patient became edema free, and kidney function, as measured by the urea clearance test, had risen to 37.7 per cent of normal.

In the first of these patients the earliest symptoms of acute nephritis occurred during the time sulfapyridine was being administered. Although moderate dosage was used, the blood levels of sulfapyridine were abnormally high, associated with a sharp drop in urine output, which occurred within twenty-four hours after beginning treatment with the drug. Five days after the drug was withdrawn the patient's blood still contained 0.8 mg. per hundred cubic centimeters of free sulfapyridine. The occurrence of edema, the elevation of blood pressure and gross abnormalities in the urine were of gradual rather than of acute onset. As far as could be determined, the renal function returned to normal in two months.

The course of events in the second patient likewise differs somewhat from the typical picture of acute nephritis complicating an acute infection in that the onset was gradual rather than sudden. The first urinary signs appeared on the day following the discontinuance of sulfapyridine therapy and for the succeeding fourteen days the symptoms increased in severity until the final explosive onset of acute uremia associated with heart failure.

Only one patient (patient 2) received antipneumococcus serum treatment in addition to chemotherapy. The use of serum has not been associated in our experience with renal complications.

Both patients have recovered from the acute phase of nephritis, the first apparently completely, but in the second case only partial recovery has taken place during the four months since the onset of nephritis.

COMMENT

It may appear that undue stress has been laid on the toxic effects of sulfapyridine. However, it seems important that such effects should be generally recognized so that due caution may be observed in the clinical use of

this valuable chemotherapeutic agent, not only as applied in the treatment of pneumonia but in other diseases as well.

Sulfapyridine gives promise of reducing the death rate from pneumococcic pneumonia and present indications make it seem probable that an even greater reduction in the mortality rate can be accomplished if the drug is used in conjunction with type-specific antipneumococcus serum.

In the opening paragraph of this paper the ideal chemotherapeutic agent was defined as "one which, by inhibiting certain vital functions of the invading micro-organism or neutralizing its products, terminates the disease without causing any toxic effect on the host." From this point of view sulfapyridine does not fully attain the ideal, since toxic effects of greater or lesser degree are not infrequent accompaniments of its clinical use. Moreover, this powerful drug may not necessarily inhibit the vital functions of the ordinarily susceptible invading micro-organism, since the virulent pneumococcus has the capacity both in vivo and in vitro to adapt itself so that the drug does not affect its rate of multiplication, virulence or specific immunologic structure.

Sixty-Sixth Street and York Avenue.

OXYGEN THERAPY

INDICATIONS AND METHODS OF APPLICATION;
RELATION TO OTHER THERAPY

CLINICAL LECTURE AT ST. LOUIS SESSION

M. A. BLANKENHORN, M.D.

CINCINNATI

Cyanosis is the main and only important indication for oxygen therapy in pneumonia. While it can be said in theory that cyanosis exists in some degree in every patient with pneumonia, it does not follow that oxygen is always indicated nor is there any justification for the routine use of oxygen to prevent cyanosis.

Cyanosis is a difficult sign to evaluate quantitatively and, since that is exactly what must be done to decide about oxygen therapy, there is a tendency to use it needlessly. This tendency becomes very pressing when the prognosis looks bad and there is not very much to be done about it. Now that there is at hand for most pneumococcic pneumonia a good remedy, the need for oxygen is definitely reduced. I find in our hospital at Cincinnati that more of our patients have got well and that we have used much less oxygen since we began the use of serum or sulfapyridine in the early stages of pneumonia.

The exact therapy of pneumonia with oxygen has been developed by keeping patients in oxygen-filled rooms for continuous treatment, which treatment is tested by measuring the actual oxygen content of arterial and venous blood. With this experience some of the guesswork goes out and it can be seen that severe anoxemia does occasionally occur in the early stages of pneumonia, oftener in the late stages, and that oxygen sometimes relieves this anoxemia. Severe anoxemia is most likely to occur when many lobes are consolidated; when the respirations become rapid and shallow, i. e., above forty per minute; when there is moisture in much of the bronchial tree, and when there is wheezing.

These circumstances can bring on serious oxygen want which may initiate many symptoms that resemble the toxic effects of infection; viz., steadily rising pulse rate with finally falling diastolic blood pressure, headache, dimness of vision, mental disturbances such as delirium, and coma. Oxygen want may cause or increase abdominal distention, also vomiting. When oxygen is successfully given, many, sometimes all, the distressing signs and symptoms disappear in a few hours and the treatment then is life saving.

Oxygen treatment may not be successful in relieving anoxemia for a number of reasons other than reasons of technic. It cannot succeed if too much lung is consolidated or obstructed by exudate. It cannot succeed if the circulation is failing or if there is toxic depression of the respiratory center by infection or drugs. Since none of these causes of failure are easily apprehended, the technic of administration of oxygen must be carefully ordered and practiced by the physician to avoid failure that can be avoided. Important points are these: The supply to the patient must be continuous and abundant, so that only large cylinders are satisfactory; these must be equipped with reducing valves to assure steady flow and flow meters are very useful as well; the inhalation device must be comfortable and must not hamper the free escape of carbon dioxide and moisture. There are numerous devices that are Council accepted. Tents, face masks and nasal tubes can all be made to serve satisfactorily, but they all require skilful and understanding care such as is rarely given by nurses or attendants. They all must be supervised by the doctor, who understands both the disease and the treatment.

Tents are the most expensive, troublesome and difficult to operate but are the most successful generally, except of course the oxygen chamber. Tents are best run by experts, such as the anesthesia department or gas therapy service in large hospitals. I have found that hospital assistant residents do the job very well in the Cincinnati General Hospital and that they learn a lot about the physiology of respiration by doing that service. Some tents require a gas washer of soda lime to take out the carbon dioxide. This greatly adds to the cost and trouble. Other tents rely on cooling and drying the circulating air with large ice chambers, and much ice is needed for air conditioning. This cooling and drying to take out carbon dioxide often contributes much to the comfort of the patient. Tents should usually have from 35 to 40 per cent oxygen but may be run for a long time at 60 per cent oxygen. Tents provide a high concentration of oxygen as well as a cool, dry atmosphere, which many patients enjoy if the tent is right. A hot tent, not properly cooled and cleared of carbon dioxide, is a terrible thing to a conscious patient; but there is no need for a tent ever to be uncomfortable. A gas tester is necessary to keep tent service up to this standard. Delirious patients sometimes fight the tent and win, for tents are not tough. In this circumstance the doctor must do some skilful guessing to decide about restraining the fighter or narcotizing him. The first procedure runs up the oxygen need possibly more than it will be helped by the tent; the latter choice depresses the respiration, sometimes increasing the cyanosis. The doctor must keep his eye on cyanosis and try the various chances.

Face masks and face tents in my hands are almost as bad as tents in arousing the fight in a delirious patient. Nasal tubes or catheters are the best for this patient usually.

Face masks are not suited to continuous use, such as the pneumonia patient needs, if the mask is closed. If the device is open to allow unhampered flow of expired air, it becomes a face tent of sorts and I think that with care to details, especially adequate oxygen flow, this arrangement will work; but I have had no real satisfaction in their use. The purpose of such a device is to retain a rich atmosphere during expiration so that when inspiration comes the inrush of room air through the mouth or nose will not dilute the stored gas too greatly.

Nasal catheters are used in many instances, even when tents are at hand. Such an arrangement is simple and costs little, but large cylinders with flow meters are needed as for tents. Catheters are sometimes tolerated by delirious patients who fight the tent. Success of nasal catheters depends on care in placing the catheter tip and keeping it there. The catheter becomes a discomfort for several causes, mostly preventable. If the catheter wiggles about with head motion or bed motion, this is overcome by holding it down to the face with adhesive tape. If the inflow is too fast through a single perforation in the catheter wall, a "hot spot" develops; this is overcome by moving it about and by humidifying the gas; also by having plenty of openings. Catheters may fail to deliver enough gas if the tip is not near the pharynx. In this circumstance the soft palate may obstruct the inflow and the gas then goes in one nostril and out the other. If the patient breathes through the mouth and the method of inspiration is quick, the inrush of room air dilutes the gas and the whole result is a weak mixture. I know of no way to overcome this difficulty entirely if the patient will not tolerate having his mouth closed with a piece of moist gauze taped over the mouth for a flutter valve. When the catheter tip is well in the oropharynx so that the entire oropharynx is entirely filled with oxygen, this dilution effect is diminished. The dilution effect is also less when the volume of each breath is not great; hence the catheter flow can supply the entire inspiratory volume and even more in rapid and shallow breathing. In some circumstances 40 per cent of oxygen or more has been provided in respired air through the catheter. The catheter should be replaced by a clean one every twelve hours or less. It should be greased with oil that will not evaporate, as with liquid petrolatum, and the nasopharynx sprayed with oil. This protects the mucous membranes from the drying effect that eventually burns or smartens painfully, causing the "hot spot." With nasal catheters the oxygen dosage must be regulated with the flow meter; but no one can prescribe the liters per minute that will relieve cyanosis. A good practice is to start the flow at as high a figure as the patient will endure, and 10 liters is about the maximum. If this is adequate, the color may improve in a few minutes. When there is a definite change, the flow may be reduced; from 6 to 8 liters per minute will generally be tolerated and the cost at this rate of flow is not great. If 10 liters per minute does not help the color of the patient in an hour, one should try placing the catheter tip lower into the oropharynx—at a spot below the palate but where the swallowing reflex will not interfere. Two catheters, one in each nostril, may be used if the patient breathes through the mouth: the flow to each catheter can then be reduced to a tolerable rate.

Oxygen therapy to be useful must be continuous as long as cyanosis develops if the treatment stops. It is not harmful to stop it for a test of doing without, except in widespread pneumonia when there is much

moisture in the air passages. Here oxygen is helpful and very necessary. Some patients seem to become habituated to a rich atmosphere of oxygen, but this condition does not develop in short time nor has it been described in lobar pneumonia.

With the best of technic oxygen may in certain cases be life saving to the pneumonia patient, but it is very difficult to prove the point. Where oxygen has been most intelligently used and checked with blood measurements, this form of pneumonia therapy is always regarded as of minor importance in lobar pneumonia as compared with serum or chemotherapy. In suffocating pneumonia, such as in capillary bronchitis; in wet hemorrhagic pneumonia, as in influenza; in pneumonia after corrosive gases; in asthma complicated by pneumonia, or in pneumonia complicated by acute bronchiolar spasm—in these forms oxygen may be the most important item in treatment.

Properly administered, oxygen inhalation is compatible with any other form of treatment. It should never substitute for specifics when such are at hand.

Cincinnati General Hospital.

GENERAL THERAPY OF PNEUMONIA

ROGER I. LEE, M.D.

BOSTON

Three spectacular therapeutic procedures in pneumonia, namely oxygen, serum and chemotherapy, especially in judicious combination, bid fair to rob pneumonia of much of its terror. Certainly the death rate from pneumonia will be strictly reduced. At this moment no man can say how much that reduction, albeit certainly great, will be and furthermore no man can say whether or no the immediate or remote future will bring further developments of these therapeutic agents or new agents.

At this date, May 1939, it is certainly premature to discard all other therapeutic devices and measures in pneumonia, and in all likelihood it will always be foolhardy to treat the disease pneumonia or any one of its symptoms exclusively and to ignore the patient. In truth the patient is the container of the disease. He then becomes the battleground of what formerly nearly always was and even now often is a titanic struggle. As the opposing forces line up and get into action and as the battle begins and goes on, the unfortunate patient or container of this devilish battleground is badly shaken and racked. Furthermore, during this turmoil the patient has functional obligations, including the transport of oxygen, serum and drugs to carry on. Moreover, according to our present beliefs the patient himself must actively participate in the battle against the invading enemy if cure is to result, no matter how specific drugs and serums seem. The patient who is an inert container will die.

Essentially the general management of a case of pneumonia consists in the conservation of strength. Rest and quiet are the prime considerations. There should be no delay in putting the patient, and that includes the suspects, to bed. Within the first twenty-four hours a patient may probably be moved without undue increase of risk in an ambulance (not an automobile) to a hospital, provided the distance is not over a few miles and provided the bed to bed journey

Read in the Panel Discussion on Pneumonia, Medical Division, General Scientific Meetings, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

THERAPY OF PNEUMONIA—LEE

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is accomplished with the smoothest possible arrangements. However, any move does actually increase the risk somewhat and after forty-eight hours of the disease the increase in risk to the patient is considerable. Therein often is required a wise balancing of benefits and hazards with the prejudice toward non-transportation after forty-eight hours.

In the home the so-called hospital regimen must be established, including a hospital bed and continuous nursing. By rest I mean the elimination of any unnecessary physical activity. The patient should not feed himself or give himself a drink. He should not turn over by himself. By quiet I mean the elimination of any unnecessary outside disturbance to the patient. This obviously includes visitors and also includes any unnecessary medical manipulations and examinations. Blood counts, blood cultures, physical examinations and x-ray examinations must be carefully organized in advance and carried out with precision and dispatch. Likewise the somewhat elaborate and technical procedures as intravenous serum therapy or intravenous fluid therapy or subcutaneous medication or fluid administration should be prepared as far as possible outside the room.

Probably next in importance is the supply of an adequate amount of fluid to the patient. On this subject there is a wide diversity of opinion. My own view is that the intake should suffice to keep the urinary output in the neighborhood of 50 ounces (3 pints, or 1,500 cc.). Less than this I regard as insufficient and much more than this as creating unnecessary work for the heart, circulation and kidneys. Some patients who sweat a good deal may have difficulty in getting in an adequate amount of fluid. Other patients may have marked gastric disturbances in the early days of the disease. Perhaps a majority of patients who take sulfapyridine have gastric symptoms to a greater or less degree. Some of these patients will require fluid by some other route, although skilful nursing with a shrewd selection of fluid, e. g. the use of very weak, rather hot plain tea, and the avoidance of egg-nogs and of excessive fruit juices will diminish the number of patients who must be disturbed either by intravenous or by subcutaneous fluids. If there is vomiting and acidosis one may lean toward intravenous saline solution with dextrose, but my personal preference based on physiologic grounds is for the subcutaneous route. The desirability of avoiding intestinal disturbance, either distention or diarrhea, both of which are well known bugaboos in pneumonia, usually decides against using the intestinal route for fluid.

In the average case of pneumonia in the acute stage, little attention need be paid to the caloric requirements. It is imperative to get in fluid and highly desirable to avoid distention or diarrhea. Hence a low residue diet without much milk meets the requirements. Obviously food requiring chewing should be avoided, but minced chicken, mashed potato, soft toast, soft cereals, eggs, ice cream and apple sauce indicate the range of possibilities. With distention milk may be further reduced and cream added. Usually a mild vegetable laxative is given each night and an enema if necessary every other day.

The evidence is clear and strong that sodium chloride is diminished during pneumonia, through perspiration and in the pulmonary exudate. Therefore the salt in the diet is increased and frequently, if capsules are well tolerated, salt is so given in 5 or 10 grain (0.3 or 0.65 Gm.) capsules up to 60 grains (4 Gm.) a day.

While there is some evidence that ascorbic acid and probably some of the other vitamins are diminished in pneumonia, at this time and for this discussion it seems better to consider vitamin and iron therapy in the management of the convalescence and not of the disease.

Over the years the old saying has been repeated "The disease is in the lungs but the danger is in the heart." Translated into the terminology of today and without attempting a precise explanation of the complicated pathologic physiology, one may say simply that the danger lies in circulatory failure. After a very thorough trial the evidence is definitely against the value of routine digitalis therapy in pneumonia. In a previously undamaged heart and circulation, digitalis and its group are but rarely indicated. The indications for the exhibition of digitalis are the usual indication of an incompetent heart. The heart is seemingly stimulated early in the disease by the circulating toxins or the fever or both. Later in the disease those patients who seem likely candidates for cardiac incompetence from previous cardiac damage, hypertension or old age may be benefited by digitalis. A not uncommon cardiac symptom in patients beyond middle age and rarely before is the occurrence of a tachycardia, paroxysmal in type, of the nature of flutter or fibrillation. Such attacks usually cease spontaneously, but quinidine or digitalis or both are ordinarily indicated.

There may be, of course, in pneumonia a wide variety of incidental symptoms. Many patients have a previous familiarity with various members of the salicylate group. If sweating is not greatly increased and if the stomach is not disturbed, some comfort, ease of headache and of general malaise and diminution of fever may be attained by the moderate use of the salicylate group. The pleuritic pain, usually early, may be distressing. A swathe is better than drugs. The salicylates may of course be tried. The exhibition of large doses of opiates has been regarded as contraindicated in pneumonia and with a good deal of supporting physiologic evidence. On the other hand the desideratum of rest is so important that I feel no hesitation in using frequent small doses of morphine subcutaneously. By small doses I mean as small as $\frac{1}{2}$ or $\frac{1}{16}$ grain (0.002 or 0.004 Gm.). This is also very useful in combating restlessness. The oral administration of morphine, codeine and opium has the objection of being decidedly constipating.

Fortunate indeed is the patient with pneumonia whose restlessness is controlled by one-fourth grain (0.016 Gm.) of phenobarbital a few times a day and who sleeps soundly with phenobarbital or pentobarbital or some similar drug. I myself am reluctant to use any further medications than those I have mentioned, but there are always exceptions.

As far as I know the only usefulness of alcohol is, if in small and nondisturbing doses, it creates a beneficial mild euphoria. Alcohol does not seem to me to have any important place in pneumonia therapy.

I mention diathermy and pulmonary collapse therapy merely to confess inadequate experience with these and similar procedures and to give my impression that at this time they do not seem to occupy a place in the management of pneumonia.

Time does not permit a discussion of the various complications and sequelae of pneumonia. Furthermore until further experience and data have been gained with the newer and more effective therapeutic agents, serums and chemicals, alone or in combination, physi-

cians are in no position to discuss the management of these conditions intelligently.

The general treatment of the pneumonia patient as I have outlined it seems highly innocuous in contrast to the era in which bleeding, purging and puking were almost routine. Likewise physicians have given up cupping, counterirritation and poultices. They no longer subject their patients (and the nurses) to the icy blasts of winter. However there may be merit in the air conditioned room in summer and perhaps in a room where the temperature can be controlled.

Even if slush baths are not used for reduction of temperature, certain forms of bathing which have a sedative effect are regarded highly. That and the judicious employment of rubbing or of massage are accepted as a part of good nursing care.

In effect, an attempt is made to manage the patient so as to conserve his strength, so that he may be fortified against the devastating tumult of the battle within him and that he may contribute what he can to the suppression of the enemy pneumonia. Pneumonia is always to be regarded as one of the doctor's most common major emergencies. Loss of time may mean loss of life. During the few days of emergency, no detail is trifling. And while the glory of a victorious battle will go to the big guns of chemotherapy, serum therapy and oxygen therapy, this battle, like other battles, is often actually won by the nonspectacular infantry; in this case, the general care of the patient.

264 Beacon Street.

Special Article

REPORT OF THE AMERICAN COMMITTEE ON OPTICS AND VISUAL PHYSIOLOGY

WALTER B. LANCASTER, M.D., CHAIRMAN
BOSTON

The committee has held some half dozen meetings since the last report and has carried on an extensive correspondence. In fact, the clerical work entailed has become too large a burden to be carried by our too willing secretary, Dr. Conrad Berens. The committee therefore voted to request the parent societies to make provision for office expenses by each contributing say \$50 to be used for this purpose.

The work of this committee is largely divided among subcommittees, whose reports form the basis of discussion and action by the whole committee. These subcommittees will be taken up seriatim:

I. COMMITTEE ON MOTOR ANOMALIES AND ORTHOPTIC TRAINING

DR. CONRAD BERENS, NEW YORK, CHAIRMAN

The National Orthoptic Council has begun its work; the first examination was held in New York on March 30 and April 1 and ten candidates were examined.

II. COMMITTEE ON CODE OF LIGHTING

DR. ALFRED COWAN, PHILADELPHIA, CHAIRMAN

There is no new business.

During the past year a related series of experiments, which were approved in principle by the committee, has been carried out on the effects of reading at 1 and 50

footcandles on the total metabolism and pulse rate at the Harvard Fatigue Laboratory by McFarland, Knehr and Berens. Negative results were obtained in this study. The data are of significance in correcting certain impressions that reading under different levels of illumination gives rise to marked alterations in metabolism.

From these data it seems justifiable to conclude that the recommendations concerning illumination in schools made by the Committee of Illuminating Engineers in 1938 should be used as a guide if new construction is undertaken or improvements are to be made in some existing school rooms; but until the results of further researches are available, it might be unwise to make drastic changes in the present lighting arrangement in all the schools because the proposed changes would increase the tax burden and possibly would be unwarranted. Another important possibility is that the recommended standards are too low, especially for the visually handicapped children in the regular class room.

III. COMMITTEE ON NEW INSTRUMENTS

DR. SANFORD R. GIFFORD, CHICAGO, CHAIRMAN

A final report was made on the telebinocular for examining and sifting out school children in need of expert attention for their eyes. The decision was reached that this instrument was not well suited for this purpose and its use was condemned.

At the request of the committee, a method has been worked out in Boston which the committee wishes to have tried out in other places where cooperation with competent ophthalmologists can be secured. It is the purpose of the committee not to recommend any method until it has been subjected to the crucial test of applying it in several independent localities to groups of say fifty to 100 children, every one of whom is given a thorough examination under cycloplegia by an ophthalmologist to check the results obtained by the school nurse or the teacher who uses the test under ordinary working conditions. It was on the basis of such check tests that the telebinocular was rejected.

IV. COMMITTEE ON OPTOMETRY

DR. S. JUDD BEACH, PORTLAND, MAINE, CHAIRMAN

The many difficult problems involved in the relations between ophthalmologists, optometrists and the public were earnestly discussed from many angles. An immediate solution is not to be hoped for. Only by gradual education and evolution can the goal of cooperation desired by many be attained. The committee voted to request the Section on Ophthalmology of the American Medical Association to reconsider the vote taken in 1935 at a special executive session without previous notice and without discussion. This action in 1935 declared it to be "unethical for members of the American Medical Association to give lectures or courses of instruction to or consult with any one not associated with the actual medical service."

V. COMMITTEE ON BETTER LIGHT—BETTER SIGHT

DR. WILLIAM L. BENEDICT, ROCHESTER, MINN., CHAIRMAN

No report was made.

VI. COMMITTEE ON RELATIONSHIP BETWEEN OPHTHALMOLOGISTS AND OPTICIANS

DR. SANFORD R. GIFFORD, CHICAGO, CHAIRMAN

Dr. Gifford sent out a questionnaire and secured valuable information, especially as to the matter of rebates, retail prices, and so on. He also had confer-

ences with some of the leading manufacturers, whom he found very anxious to remedy existing defects.

As an entering wedge in attacking the present system, he proposed, and the committee endorsed, a plan suggested by Alan Woods as follows: "In communities where there are no straight retail dispensers of optical goods (other than optometrists) physicians who do not desire to participate in any way themselves in the retail dispensing of glasses may refer their patients directly to the wholesale houses who ordinarily act as oculists' agents in the dispensing of glasses. On such reference, the wholesale houses will furnish to patients, on specific prescriptions of such physicians, glasses of comparable quality, including protected lines, at the minimum retail price prevailing in the community and will assume responsibility for breakage, adjustments, collections, etc., such as are ordinarily assumed by their accounts.

"On other than protected lines the foregoing proposal should effect a saving averaging 20 per cent or slightly more on a combination of lenses and frames as compared with the retail price commonly employed. The results will necessarily vary according to local conditions, but the general results will be as stated."

VII. COMMITTEE ON GRADING LENSES

DR. ALFRED COWAN, PHILADELPHIA, CHAIRMAN

A definition was presented of a first grade lens which was adopted, with slight modification by the committee, as follows:

A first class lens is one which, when finished, has the proper focal power and correct direction of the axis of the cylinder; is properly transparent; has regularly smooth, polished surfaces; contains no flaws, scratches or other blemishes, and is accurately centered with regard to the visual lines. Regardless of the price, any lens which meets with these requirements must be considered first class.

Ophthalmologists, of course, cannot be expected to, nor can any one else, tell whether the lens which meets these requirements was originally labeled first, second or third class.

SPECIFICATIONS FOR ILLUMINATED EYE CHART AND FIXATION LAMP UNIT

Dr. Benedict presented specifications for illuminated eye chart and fixation lamp unit, prepared by the Advisory Committee of Ophthalmologists to the Eye Health Committee of the American Student Health Association in cooperation with the National Society for the Prevention of Blindness.

The members of this advisory committee are Drs. Benedict, Gradle and LeGrand Hardy; they were aided by W. F. Little, consulting engineer.

These specifications were accepted by the committee.

COMMITTEE ON POLAROID

DR. W. H. LUEDDE, ST. LOUIS, CHAIRMAN

The facts presented in the report of our committee were not challenged by our conferences last October with Mr. Land, the originator of the Polaroid crystal layer, but the committee was pleased, at the suggestion of Dr. Lancaster, to reconsider its conclusions.

It is true that a large measure of the beneficial effect of the Sun or Daylight glasses is the result of the olive green tint added to the polaroid in these glasses, but clinical tests appear to show the superiority of glasses made with the layer of polaroid substance.

A United States Forest ranger and official snow observer in the highest Rocky Mountain region

throughout the winter gave assurance and so did others that the polaroid glasses were notably superior to the large variety of simple tinted lenses they had previously used. If funds were available, adequate clinical tests of a larger number of persons under different conditions might be considered.

It might be recommended that the name of Polaroid Daylight glasses be changed frankly to "tinted" Polaroid Sunglass instead of making the explanation in fine print where it may pass unnoticed. The practical elimination of the most annoying reflected light, which is largely polarized, is so advantageous in the outdoor use of glasses to protect against glare that proper "tinted" Polaroid glasses must be acknowledged to be much more efficient than mere tinted lenses.

Theoretically, the proper use of the polaroid film should be a great advantage in night driving to eliminate the dangers incident to glare of headlights and windshields. It is hardly possible that the expense of this equipment could be considered exorbitant when weighed in relation to the saving of human lives.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

PESCOR SHORTWAVATHERM RX MODEL NOT ACCEPTABLE

Manufacturer: Physicians Electric Service Corporation, 1054-1056 West Sixth Street, Los Angeles.

In the interest of public protection the Council has recently given attention to the Pescor Shortwavatherm, RX Model. It appears from a letter addressed to dealers that the device is sold directly to the public: to quote, "The low list price of \$145 includes heavy sponge rubber molded pads and cords, etc., and should make possible volume from a new 'customer-channel', the surface of which hasn't even been scratched," and "... a Short Wave Diathermy specially designed for patient's use at home ..." and, "Patients usually rent Short Wave Diathermia for home use to facilitate treatments, expense and departures from business."

The unit is portable, and accessories include rubber encased cords and two 6 by 8 inch rubber pads. Sinus pad, orificial and cuff electrodes are also available. The unit is designed to operate at from 50 to 60 cycles, 115 to 125 volts alternating current. It utilizes two vacuum tubes. The manufacturer claims an output for the device of from 200 to 250 watts and a wavelength of 16 meters. A surgical current is also provided for which a foot switch and cutting knives are available.

The advertising sheet "Pescor Shortwavatherm RX Model" in the opinion of the Council contains several objectionable features. Diathermy is recommended for a wide variety of ailments, which are so generalized in nature as to suggest that it is a general panacea for almost any ill. For instance, it is advocated for cardiac ailments (selected), constipation, gallbladder diseases, spleen, gastric ailments, goiter (selected), hay fever, intestinal neurosis, spinal cord ailments, pelvic diseases, pancreas ailments, liver diseases and head colds. Other questionable statements are "Penetrability beyond requirements," "Abundant power," and "Simple as A. B. C." The claim is advanced that applications may be made by any one, which might lead to unfortunate consequences for uninformed persons who attempt self treatment. The firm also states that the unit possesses a "Penetrability Meter." No critical evidence has been presented to the Council to substantiate the value of such a meter.

Another circular addressed to "Dear Doctor" points out that the appliance is "... especially designed for your patients' use at home, or as an auxiliary machine for your office ..."

It also recommends the device for minor surgery, as do the other pieces of advertising. An apparatus which is sold both to the public and to the physician, as this appears to be, for both medical diathermy and minor surgery, can only be, the Council believes, (1) a dangerous appliance for the layman to use or (2) an ineffective apparatus for the treatment of disease.

In the opinion of the Council on Physical Therapy, the Physicians Electric Service Corporation appears to be promoting an instrument in a way that is detrimental to the public interest and rational therapeutics. Sales methods which promote self treatment of disease by those unqualified to practice medicine, and appeal to the public with unscientific persuasions, may harmfully enhance a feeling of false security on the part of the public. In the light of the foregoing report, the Council on Physical Therapy voted not to accept the Pescor Shortwavatherm RX Model for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
PAUL NICHOLAS LEECH, Secretary.

SOLUTION QUININE AND UREA HYDROCHLORIDE, 5% WITH PROCAINE HYDROCHLORIDE 2%, 30 CC.

VIALS (UPJOHN) NOT
ACCEPTABLE FOR

N. N. R.

When the Upjohn Company presented this preparation for the Council's consideration its attention was called to the fact that the Council had not accepted any sclerosing or obliterative agents for the treatment of hemorrhoids although it has accepted sclerosing agents in the treatment of varicose veins. The firm was asked to supply any evidence it might have to warrant the Council in accepting a 5 per cent solution of quinine and urea hydrochloride with procaine hydrochloride for such use. In reply the firm submitted excerpts from current literature and textbooks on this subject.

The Council's referee examined the submitted material and reported his feeling that no question should be raised as to the correctness of the excerpts. He pointed out that some who report successful use of this procedure have had wide experience in this condition, while others of the authors quoted probably have not been especially interested in this subject but have written the quoted material as part of the larger question of surgery. The referee feels that there is no objection to the occasional use of this method by men who have had wide experience. He pointed out, however, that acceptance of a product for New and Nonofficial Remedies with recommendation for use in this procedure would involve its use by men who may not be especially well trained in recognition of many of the conditions which simulate or are associated with hemorrhoids. The referee further pointed out that accidents and unfavorable results which follow from this method of treatment are rarely reported, although it is well known that such have frequently occurred. The Council agreed with the referee that it would be unwise to place the weight of the Council's opinion in favor of general use of the injection treatment of hemorrhoids.

The excerpts from the literature submitted by the firm were sent to a consultant who probably has had as wide an experience in the treatment of hemorrhoids and similar rectal conditions as any one in the country. This consultant reported as follows:

The material submitted by the firm fails to point out the dangers involved when the injection treatment of hemorrhoids is undertaken without expert knowledge of the various lesions that occur in the rectum, and of the various complications such as hemorrhage, ulceration and stricture of the rectum as well as deposition of inert oily substances in the submucosa of the bowel, which results in chronic inflammatory foreign bodies. Used by men specially trained in this work, under definite indications, the injection treatment of internal hemorrhoids may be safely done as a

palliative procedure. It is my opinion that it is a rare thing to expect permanent cure, because if well developed internal hemorrhoids are present almost always there are also present varicose veins beneath the skin as external hemorrhoids which cannot be treated by injection and which subsequently cause dilatation of the veins, making internal hemorrhoids.

The referee is aware of the fact that many drugs, such as insulin or digitalis, may result in fatal accidents if improperly used. There are, however, several methods of treating hemorrhoids. It is known that the injection method is subject to accidents—infection, embolism, and so on. It is likewise true that in the hands of some men this method can be used successfully in selected cases. By accepting the recommendations for the use of injection treatment of hemorrhoids, the Council would add the weight of its influence in favor of routine or general use of this method in unselected cases, which will include those in which the outcome will not be favorable. By refusing recognition to such claims, the Council denies no one the right to use sclerosing agents for hemorrhoids if he wishes to do so. They are already available and are in New and Nonofficial Remedies but not with specific recommendations for such use. The Council has repeatedly allowed some claims and denied others for many drugs, and has consistently refused to accept any drug for use in the injection treatment of hemorrhoids.

In view of the foregoing the Council voted that for the present it continue its policy that no preparation for the injection treatment of hemorrhoids be accepted for New and Nonofficial Remedies and declared Solution Quinine and Urea Hydrochloride, 5% with Procaine Hydrochloride 2%, 30 cc. vials-Upjohn unacceptable for inclusion in New and Nonofficial Remedies, since it is recommended for this purpose.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

ADRENALIN (See New and Nonofficial Remedies, 1939, p. 229).

The following dosage form has been accepted:

Amoules Adrenalin in Oil, 1 cc.: A vegetable oil (peanut oil) suspension of adrenalin base, each cubic centimeter of the suspension representing 2 mg. of adrenalin.

ASCORBIC ACID (See New and Nonofficial Remedies, 1939, p. 499).

Tablets Ascorbic Acid, 25 mg.

Prepared by Smith-Dorsey Co., Inc., Lincoln, Neb.

Cevitamic Acid-Abbott (See New and Nonofficial Remedies, 1939, p. 500).

The following dosage form has been accepted:

Tablets Cevitamic Acid-Abbott, 0.05 Gm.

NICOTINIC ACID (See New and Nonofficial Remedies, 1939, p. 495).

Tablets Nicotinic Acid, 50 mg.

Prepared by Smith-Dorsey Co., Inc., Lincoln, Neb.

STEARNS HALIBUT LIVER OIL WITH VIOSTEROL (A. R. P. I. PROCESS).—A brand of halibut liver oil with viosterol-N. N. R.

Prepared by the International Vitamin Corporation, New York. The viosterol (A. R. P. I. Process) is manufactured by the American Research Products, Inc., a division of General Mills, Inc., Minneapolis, under license agreement with E. J. du Pont de Nemours Company (Frederick Stearns & Company, distributor). U. S. patent 2,117,100 (May 10, 1938; expires 1955).

Stearns Halibut Liver Oil with Viosterol (A. R. P. I. Process) (with other fish liver oils) Capsules.—Each capsule contains 8,500 units (U. S. P.) of vitamin A and 1,700 units (U. S. P.) of vitamin D.

Stearns halibut liver oil with viosterol (A. R. P. I. Process) is prepared by combining refined halibut liver oil, one or more other fish liver oils, and viosterol (A. R. P. I. process) in such proportions as to bring the vitamin potency of the finished product to 10,000 units (U. S. P.) of vitamin D and 65,000 units (U. S. P.) of vitamin A per gram. Viosterol (A. R. P. I. Process) is ergosterol activated by low velocity electrons.

THE JOURNAL OF THE
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SATURDAY, OCTOBER 7, 1939

PERIODICITY OF INFLUENZA

Like other epidemic diseases, influenza tends to fluctuate in its frequency and in its virulence. Furthermore, this intermittence was evident not only in the case of the great pandemics, such as the one of 1917-1918, but also in the minor epidemics which occurred both before and after that calamity. It has been difficult however to relate the fluctuations which actually occurred with any definite time or seasonal factor. When the literature on influenza was reviewed by Jordan¹ in 1927 the theory of Brownlee, who attempted to relate endemic "influenza" to a periodicity of thirty-three weeks, was dominant. Jordan pointed out, however, that the evidence available was not sufficient to establish definitely the conclusion that a nonseasonal cycle as predicted by Brownlee was an inherent and general characteristic of influenza in postpandemic periods, because the observations did not cover a sufficient number of different areas to give them generality, because they failed to cover a sufficient period of time in the life history of influenza and because for the years 1918-1923 the facts adduced, although apparently consistent with the hypothesis of a thirty-three week cycle, seemed to be also consistent with the simpler assumption of a cycle approximating twelve months.

Equally speculative has been the explanation for the irregular intervals existing between the great pandemics. The various explanations that have been advanced, according to Jordan, fall into two main categories: those postulating a change in the distribution or nature of the virus, and those attributing the phenomenon to something in the condition of those attacked. To these a third may be added; namely, a decrease of the opportunities for spread of the infection. After consideration of the evidence up to 1927, the most plausible of these hypotheses, he thought, rested in a change in the virulence of the infecting microbe as the essential cause of the rise and fall of pandemic influenza. The coming

into existence of a peculiar strain of influenza virus to cause the pandemic manifestations has not been wholly disproved by any subsequent studies and has, in fact, received some theoretical support by demonstration of different strains of influenza virus both in man and in certain lower animals.

During the last twelve years much further study has been accorded this subject, although no pandemic has appeared. Recently Webster² has again challenged Brownlee's thirty-three week single phase cyclic hypothesis and has presented a two phase theory which he thinks may explain the observed periodicity of influenza. While not denying the part played by seasonal influences in influenza mortality, the twelve month cycle, Webster says, does not permit of predictions with any accuracy nor can it account for the major epidemics in the summer and autumn. From his analysis of the past forty-nine years (1890-1939) he postulates a diphasal activity of influenza most strikingly evident in the three pandemic waves of 1918-1919. This represents a modification of Brownlee's single phase thirty-three week theory with a seasonal factor and accounts, Webster believes, for all the main phenomena. Phase 1, that occurring at approximately the thirty-third week interval, has been the major phase, although phase 2 (the intermediate) about sixteen weeks after phase 1 has led to a number of serious outbreaks (as in February-March 1924 and January-March 1932, he says, and to the first and third pandemic waves of 1918-1919). Some variation of the thirty-third week period is occasionally evident and indeed at present the evidence suggests that a thirty-six week period exists now. The cause of variation of the interval, Webster believes, may be one intrinsic to the virus or be due in part to a seasonal element. The well known seasonal incidence of interpandemic influenza may be due not only to meteorologic conditions and to a lowered resistance of the population in the winter-spring months but to an intrinsic increase in activity on the part of the virus.

The factual data on which this theory is based are restricted. Adequate testing of the theory should include more complete analysis of morbidity rates and the study of minor outbreaks and of relapses and recurrences. On this theory, however, it should be possible to predict to some degree future epidemics and outbreaks. The most likely time for a major epidemic would be, he says, February 1941 (phase 1 outbreak), although a phase 2 outbreak of some severity seems possible in February 1940.

Critical analysis of this interesting theory does not as yet lead, however, to complete conviction. In a previous study Webster attempted to demonstrate the periodicity of cancer and other neoplastic diseases, which

1. Jordan, E. O.: Epidemic Influenza, Chicago, American Medical Association, 1927.

2. Webster, J. H. D.: The Periodicity of Influenza, Edinburgh M. J. 46: 591 (Sept.) 1939.

he says is closely similar to that demonstrated for influenza. This is a most surprising concordance, since there seems little else of parallelism in these two diseases. Furthermore the cycle of thirty-three weeks of Brownlee's hypothesis, which in the main Webster accepts, has not yet been freed from all the criticisms previously made by Jordan and others. Webster also states that in this cycle missed periods are often seen, especially in the summer and autumn months, and the half-periods (phase 2), which Webster suggests are due to a double strain or grouping of infected strains, cannot as yet be accepted as a wholly established phenomenon. No matter how this hypothesis withstands further critical analysis, its usefulness as an instrument of prophecy will receive practical trial in connection with the predicted outbreaks of February 1940 or February 1941.

THE RENAISSANCE OF SILK IN SURGERY

Clinical experience has demonstrated that the problem of ideal wound healing is complicated. It involves not only the presence or absence of bacteria in the wound, the nature of the organisms and the resistance of the patient but also a number of other factors. Aseptic healing of an incision requires a systematic, meticulous, aseptic operating room technic in all its many details, minimum traumatization of the tissues, complete hemostasis and, less important, but nevertheless significant, the selection of proper ligature and suture material. After more than half a century of use of an absorbable suture, many surgeons now seem ready to discard such materials to return to the use of silk in the repair of clean wounds and incisions. The older masters of the craft who, after unsatisfactory experience, rejected catgut and returned to silk include such leaders as Theodore Kocher, Heidenhain, Hagler and, in our own country, William Stewart Halsted.

In a now oft quoted paper, published in *THE JOURNAL* in 1913, Halsted¹ thus summarized his objections to the use of catgut:

The relatively high cost of catgut, its bulkiness, the inconveniences attending its use and sterilization, its inadequacy, the uncertainty as to the time required for its absorption, and the reaction which it excites in a wound, induced me to discard it completely for clean wounds in the surgery both of the human subject and of animals. With the fine silk in our wounds, which for twenty-three years have, as a rule, been closed without drainage, suppuration almost never occurs. But catgut, even that which we have no cause to believe is not sterile, irritates the wound for some reason, perhaps because it serves as culture medium for saprophytic organisms which are carried into it from the deep epithelium and follicles of the skin. It should be borne in mind that during the greater part of the period of its disintegration the catgut suture is not only not serving its purpose but is playing the role of necrotic tissue, of a culture

medium. It is well within reason to expect that the technic may be at least so perfect when silk is employed that the wound will become infected not once in a hundred cases.

Recent clinical and experimental studies seem to bear out Halsted's position. Thus, Shambaugh and Dunphy² demonstrated in dogs that operative wounds repaired with silk tolerate bacterial contamination better than similar wounds repaired with catgut; that the healing of experimental suppurating wounds is not appreciably delayed by the presence of buried silk sutures and ligatures, provided a fine grade of silk is used, the sutures are cut close to the knot, and continuous sutures are not employed. They also showed that experimental suppurating wounds repaired with fine silk may heal completely without the removal or the spontaneous discharge of the silk sutures. Jenkins,³ in his analysis of 1,294 cases of abdominal wound disruption, mentions among the causes imperfections in the catgut and rapid digestion as a result of sensitivity to catgut protein, to chromic acid and to infection. Kraissl⁴ demonstrated the possibility of an allergic reaction to catgut in patients with edema of the wound edges and disruption of abdominal wounds. He was able to sensitize guinea pigs to plain and to chromic catgut and to chromic acid with the result that 30 per cent of these animals disrupted the abdominal wound following a celiotomy. All of a series of twenty-six control guinea pigs healed normally except one. It appears likely therefore that the local reaction in patients allergic to catgut predisposes to infection and favors wound disruption. The incidence of this allergy, according to Kraissl, increases with a history of allergy or of a previous operation.

Superiority of silk over catgut, according to Meleney,⁵ is due to the following facts: 1. Hemostasis is better, for the silk knots do not become untied as do catgut knots. 2. The cellular and fluid reaction about silk is minimal while about the catgut it is maximal; silk is almost inert in the tissues, while catgut is dead tissue which must be digested. 3. The use of silk automatically requires the surgeon to be more gentle with the tissues.

Whipple⁶ stated at a conference last year that, since silk has been adopted in his clinic, the improvement in wound healing has been so striking as to leave no room for argument as to both immediate and late results. He emphasizes that one should not attempt to use silk unless one is willing to change one's technic and instruments. The essentials of this technic include the use of the finest grades of silk, interrupted sutures, careful hemostasis and a constant effort to tie sutures without tissue tension.

2. Shambaugh, Philip, and Dunphy, J. E.: Postoperative Wound Infections and the Use of Silk: An Experimental Study, *Surgery* 15: 379 (March) 1937.

3. Jenkins, H. P.: A Clinical Study of Catgut in Relation to Abdominal Wound Disruption, *Surg., Gynec. & Obst.* 64: 648 (March) 1937.

4. Kraissl, C. J.; Kesten, B. M., and Cimiotti, J. G.: The Relation of Catgut Sensitivity to Wound Healing, *Surg., Gynec. & Obst.* 66: 628 (March) 1938.

5. Meleney, F. L.: Infection in Clean Operative Wounds, *Surg., Gynec. & Obst.* 60: 264 (Feb., No. 2A) 1935.

6. Whipple, A. O.: The Choice and Use of Ligature and Suture Material in the Repair of Clean Wounds, *Internat. Abstr. Surg.*, p. 109; in *Surg., Gynec. & Obst.*, August 1939.

1. Halsted, William Stewart: Ligature and Suture Material: The Employment of Fine Silk in Preference to Catgut and the Advantages of Transfixion of Tissues and Vessels in Control of Hemorrhage; Also an Account of the Introduction of Gloves, Gutta-Percha Tissue and Silver Foil, *J. A. M. A.* 60: 1119 (April 12) 1913.

MAGNESIUM IN NUTRITION

In recent years numerous quantitative studies have greatly enhanced our understanding of the influence of mineral elements in animal economy. The belief that magnesium is essential for growth in the higher plants was confirmed in 1906, when Willstätter discovered that it forms an integral part of the chlorophyll molecule. Until 1932, however, when Kruse and his co-workers¹ published their observations on magnesium deficiency in the rat, the indispensability of this element for the animal organism had not been clearly established.

The extent to which a deficiency of magnesium may occur in the human dietary is not definitely known. Furthermore, the nature of the pathologic changes that might be expected to occur as a result of a deficiency of magnesium has only of late been disclosed by experimental studies on animals. Duckworth² has recently presented the symptomatology of experimental magnesium deficiency. The fragmentary evidence available indicates that one effect of magnesium deficiency is a disturbance of normal calcium metabolism. Extensive pathologic depositions of calcium salts in the yellow elastic fibers of the endocardium and in the aorta, the jugular and the larger arteries as well as in the soft tissues have been described in calves whose regimen was low in magnesium. Similarly, in rats which received an inadequate amount of magnesium in the diet an increase in the percentage of calcium in the heart, kidney and muscles has been observed. The manifold effect of magnesium deprivation was shown by Kruse,¹ who found that magnesium deficiency in rats was characterized by vasodilatation, hyperemia of the cutaneous vascular system, increased hyperirritability, cardiac arrhythmia and fatal tonic-clonic spasms. Similar effects have been observed in dogs on a magnesium-poor diet. Determinations of the magnesium content of the serum of dogs on such rations have shown that there is an early and progressive decrease in the amount of the metal present and that the value remains low during the convulsive period. New problems regarding the causation of tetany have arisen as a consequence of its occurrence in animals suffering from magnesium deficiency.

The human requirement for magnesium has been studied by a number of investigators. On the basis of balance experiments, the daily magnesium requirement of children from 4 to 7 years of age has been estimated to be not less than 13 mg. per kilogram of body weight. In a group of preschool children investigated by Daniels and Everson,³ 75 per cent were found to be receiving less than the optimal amount of this element as judged by retention of magnesium under certain conditions. The meager information that is available regarding the magnesium requirement of pregnant women indicates that from 350 to 450 mg. daily is necessary during preg-

nancy. The daily magnesium requirement for the maintenance of adults has been reported to be as low as 0.2 Gm. and as high as 0.6 Gm. Duckworth assumes that the lower estimate is more nearly correct. Judging from data available on the magnesium content of freely chosen American diets, the requirement will be met provided the daily energy intake is in the vicinity of 2,500 calories. The possibility of adult human deficiency cannot be ruled out, however, until further information is available concerning the magnesium requirement.

Hirschfelder⁴ has suggested that the clinical occurrence of magnesium deficiency under certain conditions is within the realm of possibility. This investigator observed low levels of magnesium in the plasma in several patients accompanied by hyperirritability of the neuromuscular system often associated with muscular twitchings and convulsions. Nevertheless, so little is known of the function of magnesium in the organism that clinically observable abnormalities in man cannot at present be said with certainty to be due to magnesium deficiency or to a disorder of magnesium metabolism. The systematic study of magnesium metabolism by accurate analytic and experimental methods is little more than begun. Future investigations may be expected to add considerably to our knowledge of this problem.

Current Comment

OXYGEN AND CARBON DIOXIDE IN PNEUMONIA

Although oxygen has been employed in pneumonia for nearly two decades, not all of the factors concerned in its administration have been thoroughly elucidated. In an experimental investigation of this subject by Cohn and his collaborators,¹ five series of experiments were performed on carefully picked dogs, embodying the determination of the normal physiologic variations in oxygenation and acid-base balance occurring in the blood of the dogs, the determination of the effect of experimental pneumonia on the oxygenation and acid-base balance of the blood, the determination of the effect of breathing air enriched with oxygen alone on normal dogs and on anoxemic dogs, the determination of the effect of the breathing of air to which carbon dioxide had been added on normal and pneumonic dogs, and the determination of the effect of breathing air enriched with both oxygen and carbon dioxide on normal and pneumonic dogs. Careful controls were employed in all experiments. The experimental bronchopneumonia was produced by the intrabronchial injection of 1 per cent hydrochloric acid. Although the pneumonia was accompanied by pronounced anoxemia, significant change in the acid base balance of the arterial blood was not observed. The investigators also found that oxygen-enriched atmosphere increased the oxygen saturation of

1. Kruse, H. D.; Orent, Elsa R., and McCollum, E. V.: *J. Biol. Chem.* **96**: 519 (May) 1932.

2. Duckworth, John: *Nutrition Abstr. & Rev.* **8**: 841 (April) 1939.

3. Daniels, Amy L., and Everson, Gladys J.: *J. Nutrition* **11**: 327 (April) 1936.

4. Hirschfelder, A. D.: *Clinical Manifestations of High and Low Plasma Magnesium*, *J. A. M. A.* **102**: 1138 (April 7) 1934.

1. Cohn, D. J.; Tannenbaum, Albert; Thalheimer, William, and Hastings, A. B.: *Influence of Oxygen and Carbon Dioxide on the Blood of Normal and Pneumonic Dogs*, *J. Biol. Chem.* **128**: 109 (April) 1939.

the arterial blood of normal dogs slightly and of pneumonic dogs greatly, without alteration in the acid-base balance. Addition of carbon dioxide to the inspired air caused a slight increase in the arterial saturation of both normal and pneumonic dogs. The addition of carbon dioxide to the inspired air was accompanied by a change in the acid-base balance of the blood indicative, they believe, of respiratory acidosis. This acidosis was more severe in pneumonic than in normal dogs. Moreover, oxygen-enriched atmosphere containing carbon dioxide was accompanied both by increased oxygenation of the blood of the normal and pneumonic dogs and by respiratory acidosis, which was greater in the pneumonic than in the normal dogs. Both normal and pneumonic animals kept in high carbon dioxide atmosphere showed a change in acid-base balance indicative of physiologic compensation. The evidence available indicates, the investigators believe, the decreased ability of pneumonic dogs to eliminate carbon dioxide. Since oxygen alone achieves the desired reoxygenation of the blood when this is possible, the addition of carbon dioxide is, they believe, of doubtful benefit. Furthermore, the usual rapid respirations induced by carbon dioxide represent an added burden to an already overburdened respiratory and cardiovascular system. In view of the conflicting clinical evidence on the value of adding carbon dioxide to oxygen in the treatment of pneumonia, these clear-cut experimental studies can be adduced as offering evidence that the use of oxygen inhalations alone may be indicated in the treatment of pneumonia.

Association News

ANNUAL CONFERENCE OF SECRETARIES OF STATE ASSOCIATIONS AND EDITORS OF STATE JOURNALS

The Annual Conference of Secretaries of Constituent State Medical Associations and Editors of State Medical Journals will be held in Chicago November 17 and 18. The first session will be convened at 10 a. m. Friday, November 17. All meetings will be held in the Assembly Room of the American Medical Association Building, 535 North Dearborn Street, Chicago.

Officers of state medical associations and county medical societies who wish to attend this conference will be heartily welcome, as will individual members of the Association who may desire to be present.

ADDRESSES BY OFFICIAL STAFF

DR. PAUL C. BARTON:

- October 11—Dubuque County Interprofessional Society, Dubuque, Iowa.
- October 20—North Shore Alumnae of Chi Omega, Evanston, Ill.

DR. W. W. BAUER:

- October 12—Fifth District, Federation of Women's Clubs, Lamoni, Iowa.
- October 15-19—American Public Health Association, Pittsburgh.
- October 25-26—Parent Teacher Association, High Schools, Nashville, Tenn.
- October 27-28—Eastern Tennessee Education Association, Knoxville, Tenn.

DR. MORRIS FISHBEIN:

- October 10—Town Hall, Grand Junction, Colo.
- October 12—Associated Town Halls, Inc., Jefferson City, Mo.
- October 13—Northwest Division of Iowa State Teachers Association, Sioux City, Iowa.
- October 26—Bethany College, Bethany, W. Va.
- October 27—Eastern Ohio Teachers Association, Cambridge, Ohio.

DR. ROCK SLESTER:

- October 11—Delaware State Medical Society, Wilmington, Del.
- October 18—Jackson County Health Forum, Kansas City, Mo.
- October 30—Oklahoma City Clinical Society, Oklahoma City.

DR. PAUL A. TESCHNER:

- October 16—University Clinics' Nurses Class, Chicago.
- October 26—Annual Meeting, Wisconsin Anti-Tuberculosis Association, Milwaukee.

DR. NATHAN B. VAN ETEN:

- October 9—The Columbia Medical Society, Columbia, S. C.
- October 11—Indiana State Medical Association, Fort Wayne.
- November 1—The Interstate Post Graduate Medical Association of North America, Chicago.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. William E. Bones, Montgomery, associate in child hygiene, state department of health, has been appointed to the staff of the Council on Medical Education and Hospitals of the American Medical Association, Chicago. He graduated at Vanderbilt University School of Medicine, Nashville, Tenn., in 1931.

Changes in Health Officers.—Dr. George E. Maddison, Monroeville, formerly health officer of Monroe County, has been appointed health officer of Henry County, succeeding Dr. Carl T. Martin, Abbeville, who resigned to enter private practice. Dr. William A. Dodson Jr., Fayette, has been named health officer of Winston County, succeeding Dr. Paul H. Hilbert, Double Springs, who has joined the health department in Cincinnati, it is reported.

Special Society Elections.—Dr. Charles N. Carraway, Birmingham, was elected president of the Alabama Association of Railroad and Industrial Surgeons September 12 at its meeting in Birmingham; Dr. Napoleon S. Johnson, Clanton, vice president, and Dr. Jacob U. Ray, Woodstock, secretary for the twenty-third consecutive year.—The Alabama State Pediatric Society reelected its officers at the recent annual session in Birmingham: Drs. Stewart H. Welch, Birmingham, president; M. Vaun Adams, Mobile, vice president, and William R. Britton, Montgomery, secretary-treasurer. The next annual meeting will be in Birmingham, the time to be determined later.

ARKANSAS

Changes in Medical School Staff.—Recent changes include the appointment of Dr. Charles R. Henry as professor of obstetrics and gynecology and of Forrest R. Davison, Ph.D., assistant professor of pharmacology, University of Vermont College of Medicine, Burlington, as assistant professor of physiology and pharmacology. Dr. Edgar J. Poth, assistant professor of surgery, Stanford University School of Medicine, San Francisco, has been appointed head of the department of surgery.

District Meeting.—The Fifth Councilor District Medical Society was addressed in Camden October 5 by Drs. William Hibbitts, Texarkana, Texas, on "A Brief Review of Intestinal Obstruction"; Dorman B. Barber, Alexandria, La., "Latent Scurvy," and Charles W. Mayo, Rochester, Minn., "Surgery of the Right Colon." A public session was addressed, among others, by Mayor Don Harrell, Camden; Dr. Leopold H. Reeves, Fort Worth, Texas, "The Implications of Socialized Medicine"; Dr. Mayo, "Time and Its Relation to Disease," and Governor Carl Bailey.

CALIFORNIA

Society News.—The Los Angeles Society of Ophthalmology and Otolaryngology was addressed September 25 among others by Dr. Victor Goodhill on "The Histopathology of Syphilis of the Ear."—At a meeting of the Los Angeles Society of Neurology and Psychiatry September 20 the speakers were Drs. Archie M. Roberts on "Psychiatry in Internal Medicine" and Jesse L. Henderson, Compton, "Psychotherapy," and Thomas D. Cutsforth, Ph.D., "Personality Problems of the Alcoholic."

Study of Methods for Preserving Blood.—The Rosenberg Foundation has given \$6,000 to the University of California to establish a blood bank at the San Francisco Hospital. The grant, which will be administered by an advisory committee composed of the deans of the medical schools of California and Stanford universities and the director of health of San Francisco, will be used to stimulate investigation of methods for preserving blood in centralized pools or banks and for distributing it in good condition. The grant stipulates that the work is to be done by the University of California; Miss Cordula Hull, assistant in medicine at the university, has been named to carry on the research.

DELAWARE

State Medical Meeting in Wilmington.—The Medical Society of Delaware will hold its annual session at the Delaware Academy of Medicine, Wilmington, October 9, under the presidency of Dr. Meredith I. Samuel, Wilmington. The society is celebrating its sesquicentennial this year. The speakers on the program will include:

- Dr. Eli K. Marshall Jr., Baltimore, Sulfapyridine as a Bacterial Chemotherapeutic Agent.
- Dr. John H. Foulger, Wilmington, subject not announced.
- Dr. John T. Bauer, Philadelphia, The Difficulty in Early Diagnosis of Primary Cancer of the Lung.
- Dr. William Edwin Bird, Wilmington, Right Paraduodenal Hernia.
- Dr. Fred H. Albee, New York, Massive Resection of Bone Sarcoma with Immediate Bone Graft Replacement.
- Dr. Charles William Dunn, Philadelphia, Hormone Therapy: Uses and Abuses.
- Dr. George Howard Cross, Chester, Pa., Ophthalmology and Its Relation to Industry.

The sesquicentennial of the state society will be held in a building which dates nearly as far back as the society itself. The old Delaware Bank Building, now the Delaware Academy of Medicine, was chartered in 1795 and the present building was erected in 1816 at Sixth and Market streets, where it stood until 1931, when it was removed to its present location along the Park Drive on land adjacent to that once held by Tyman Stidham, the first doctor in Delaware. The building was reerected as it stood originally with the exception of a few modern interior alterations. The original hand-hewn rafters joined with wooden pegs, the staircase and floors have been preserved, as well as the original fence surrounding the building; all are as they appeared one hundred and twenty-three years ago. A feature of the sesquicentennial is a historical exhibit to help picture the medical background of the state. The display includes photographs of presidents of the society, old books, instruments, diplomas, fee bills and many other items of special interest. The women's auxiliary to the state medical society will meet October 10.

FLORIDA

Society News.—Drs. Edward W. Cullipher and Leonidas W. Dowlen addressed the Dade County Medical Society, Miami, recently on "Common Foot Ailments" and "Endocrinology of Menstruation" respectively.—Dr. Michael Smith, West Palm Beach, addressed the Palm Beach County Medical Society recently on "The Modern Conception of Tuberculosis."

District Meeting.—The third annual meeting of the South-west Medical District Society was held at Lakeland September 28 at the Yacht and Country Club under the presidency of Dr. Herman W. Watson. Dr. John F. Wilson, president of the Polk County Medical Society, gave the address of welcome. The speakers included Drs. George F. Highsmith, Arcadia, on "Prevention and Control of Venereal Diseases"; Daniel F. H. Murphy, St. Petersburg, "Pituitary Gland Dysfunction"; Charles L. Farrington, St. Petersburg, "Osteomyelitis," and Emile Woods, Tampa, "Low Blood Pressure and Pregnancy." After dinner, J. Hardin Peterson, U. S. Congressman, was to discuss "Current Legislation of Interest to the Medical Profession."

IDAHO

New Industrial Bureau Head.—Dr. Augustus F. Galloway Jr., Kellogg, has been appointed medical officer of the state bureau of industrial hygiene to succeed Dr. Samuel Weissross, Boise, who resigned to enter private practice in Spokane, Wash.

ILLINOIS

Fifty-One Deaths in Typhoid Outbreak.—Fifty-one deaths had occurred in the outbreak of typhoid at the state hospital for the insane near Manteno, the Chicago Tribune reported September 30. At this time fifty-five patients were said to be still under observation and eleven of them were suspected carriers.

Society News.—The Lee County Medical Society was addressed in Dixon September 21 by Drs. Guy S. Van Alstyne and James J. Callahan, Chicago, on "The Management of Breast Tumors" and "Fractures About the Elbow," respectively.—At a meeting of the Fulton County Medical Society in Canton September 21 Dr. Carlo S. Scuderi, Chicago, spoke on fractures.—Dr. Robert S. Berghoff, Chicago, discussed "Senile Ectasy—A Clinical Discussion of Vascular Changes" before the Cass County Medical Society, Rushville, September 20. The meeting was in honor of physicians of the county who have been in the practice of medicine for fifty years.—Dr. Carl F. Vohs, St. Louis, discussed "Medical Economics in Relation to General Practice" before the Sangamon County Medical Society, Springfield, September 7.—At a meeting of the Peoria City Medical Society September 19 Dr. Laurence H. Mayers, Chicago, spoke on "Differential Diagnosis of Acute Abdominal Pains."

Chicago

Society News.—The Illinois Association for the Crippled Inc. will hold its third annual meeting at the Knickerbocker Hotel October 10 under the presidency of Dr. Edward L. Comper.

University of Chicago News.—Dr. Parker Dooley, assistant professor of pediatrics, Cornell University Medical College, New York, has been appointed assistant professor of pediatrics in the School of Medicine of the Division of Biological Sciences, University of Chicago, it is announced. Dr. Francis B. Gordon, assistant professor of bacteriology at the university, will return to the faculty this fall after a year's study with Dr. Christopher H. Andrewes at the National Institute for Medical Research, London. Subjects of new courses at the university include forensic medicine, background study of human evolution and abnormalities of voice and speech.

Scientific Programs of the Chicago Medical Society.—The Chicago Medical Society is planning a series of all day programs to be held on the third Wednesday of each month from October through April. There will be clinics, demonstrations, lectures and round table discussions on the general subject. The day portion of the program will be held in one or another of the teaching institutions of the city. The evening meetings will be held at the Chicago Woman's Club Theater on Eleventh Street near Michigan Boulevard. Detailed programs will be furnished each month. The topics to be considered at these meetings are:

- October 18, Fractures at the Cook County Hospital. 8:30 p. m., The Treatment of Skull Fractures, Dr. Harry E. Mock.
- November 15, Nutritional Deficiency Diseases at Thorne Hall, the Chicago Campus of Northwestern University. 8:30 p. m., The Vitamin B Complex and Pellagra, Dr. Tom D. Spies, Cincinnati.
- December 20, Cardiovascular-Renal Diseases (place not decided). 8:30 p. m., Arteriosclerosis Obliterans: The Modern Conception of Its Social Significance, Diagnosis and Treatment, Dr. Irving S. Wright, New York.
- Jan. 17, 1940, Industrial Medicine and Traumatic Survey at St. Luke's Hospital. 8:30 p. m., Evaluation of Disability Due to Cardiovascular Disease.
- Feb. 21, 1940, Topic and speaker to be selected.
- March 20, 1940, Endocrinology at the University of Chicago Clinics. 8:30 p. m., Misuse of Biologicals in Medical Practice.
- April 17, 1940, Obstetrics and Care of the New-Born. 8:30 p. m., Maternal and Infant Mortality in Chicago, 1935-1939.

A luncheon for members and guests will be arranged at or near the institution in which the clinical program is to be presented. A dinner will be held at the Chicago Woman's Club before the evening meetings. Members and guests are advised that admission will be by ticket only. Tickets must be obtained not later than the Saturday preceding the meeting. The price of the luncheons will be 50 cents and of the dinners \$1.50. For clinic, luncheon and dinner tickets apply to the Chicago Medical Society, 30 North Michigan Avenue, Chicago, phone Central 3026. All members of the Illinois, Wisconsin, Iowa, Indiana, Michigan and other state medical societies are cordially invited to attend these all day programs.

INDIANA

Changes at Indiana University.—Dr. David A. Boyd Jr., instructor in psychiatry and assistant physician in the Neuro-psychiatric Institute, University of Michigan Medical School, Ann Arbor, has been appointed head of the department of mental and nervous diseases of the Indiana University School of Medicine and Medical Center, Indianapolis, and Dr. LaRue Carter, member of the school faculty since 1914, has been named chairman of the division of neurology in the same department. According to the announcement, growth of the department under the leadership of Dr. Max A. Bahr, superintendent of the Central State Hospital, Indianapolis, has made the selection of a full time director necessary, although Dr. Bahr will continue with the department so far as his duties at the hospital permit.

KANSAS

Postgraduate Course on Heart Disease.—A five day postgraduate course on the study of heart disease will be held in Emporia this month, according to an announcement from the state medical society. Dr. David Scherf, New York, will conduct the course.

Society News.—Dr. George F. Green, South Bend, Ind., discussed "Factors Tending to Reduce the Mortality in Appendicitis" before the Shawnee County Medical Society, Topeka, September 11.—At a joint meeting of the Wyandotte County Medical Society and the Kansas City Veterinary Society September 19 the speakers were Dr. Louis B. Gloyne and F. B. Croll, D.V.M., on prevention and treatment of rabies. The medical society was addressed September 5 by Drs. Albert J. Rettenmaier on "Pelvic Appendicitis" and Maurice A. Walker, "Use of Barbiturates in Surgery."

Personal.—Dr. John A. Billingsley, Kansas City, has been appointed state ophthalmologist for the division of the blind by the Kansas State Board of Social Welfare, succeeding Dr. Clifford J. Mullen, who resigned September 1. Dr. Mullen was the first appointee after the department was organized.—Drs. Henry N. Tihen, Wichita, Noble E. Melencamp, Dodge City, and Hugh A. Hope, Hunter, have been appointed to the medical advisory committee of the Norton Sanatorium for Tuberculosis. Drs. Forrest L. Loveland and Fred P. Helm, Topeka, the latter ex officio as secretary of the state board of health, retain their membership until 1940.

Lectures on Medical History.—A course on medical history will again open the library and museum of medical history at the University of Kansas School of Medicine, Kansas City, it is announced. Lecturers in the course include:

- Dr. Sanford V. Larkey, librarian, William H. Welch Medical Library, Johns Hopkins University School of Medicine, Baltimore, October 9, Primitive Medicine; Egyptian Medicine.
- Dr. John Farquhar Fulton, Sterling professor of physiology, Yale University School of Medicine, New Haven, Conn., Jan. 15, 1940, History of Physiology.
- Dr. Henry E. Sigerist, William H. Welch professor of the history of medicine and director of the Institute of the History of Medicine at Johns Hopkins, March 4, 1940, The Future of Medicine in the Light of History.
- Chauncey D. Leake, Ph.D., librarian of the medical school library, lecturer in medical history and bibliography, and professor of pharmacology, University of California Medical School, San Francisco, March 11, 1940, The History of the Development of Therapeutic Drugs; The History of Anesthesia.

LOUISIANA

Personal.—Dr. Thomas C. Paulsen has been appointed physician to the Louisiana State University, Baton Rouge, and medical director of its hospital.—Dr. Roy W. Wright has been appointed director of Charity Hospital, New Orleans, to fill the vacancy left by the death of Dr. George S. Bel. Drs. Charles B. Odom and Joseph O. Weilbaecher Jr. were named assistant directors.

New Dean at Louisiana Medical Center.—Dr. Beryl I. Burns, since 1932 professor and head of the department of anatomy, Louisiana State University Medical Center, New Orleans, has been appointed dean of the school to succeed Dr. Joseph Rigney D'Aunoy, who resigned in August. Born in Missouri, Dr. Burns graduated at the State University of Iowa College of Medicine, Iowa City, in 1924; he took a degree of doctor of philosophy at Northwestern University Medical School, Chicago, in 1933. He has served on the teaching staffs of the University of Michigan Medical School, Ann Arbor, Iowa college of medicine and the University of Utah School of Medicine, Salt Lake City, where he served as dean from 1929 to 1932. Dr. D'Aunoy had been serving as dean of the medical school, pathologist and director of laboratories at Charity Hospital and professor of pathology and bacteriology. In his letter of resignation he intimated

that the fulfilment of all these offices would endanger his health but asked to remain active as medical consultant to Charity Hospital and as professor in the medical school. Immediately after Dr. D'Aunoy's resignation an executive committee was appointed comprising Drs. Urban Maes as chairman, John R. Schenken, Edgar Hull, James T. Nix, Richard Ashman, Ph.D., and Dr. Burns. On Dr. Burns's appointment as dean, it was decided to continue the executive committee to be active in all school affairs. Dr. Schenken was appointed to a newly created position as assistant to the dean.

MARYLAND

Personal.—Dr. Daniel H. Kress and his wife, Dr. Lauretta E. Kress, recently marked their retirement from active practice with a farewell gathering on the lawn of Washington Sanitarium, Takoma Park, where they have been on the staff for thirty-two years. They will live in Orlando, Fla.

Camp for Diabetic Children.—The third annual camp for diabetic children was held at the Christ Child Farm for Convalescent Children, Rockville, during August. Diabetic children of limited means, 6 to 12 years of age, were eligible. The camp was under the supervision of Drs. Eugene Clarence Rice Jr., Kemp Hammond Mish, Samuel Benjamin and Benjamin Manchester, Washington, D. C.

Anonymous Donor Aids Venereal Disease Control.—A model program on venereal disease control was formally launched in Centerville recently, with Dr. Thomas Parran, surgeon general, U. S. Public Health Service, officiating. According to *The Health Officer*, federal and state funds for the support of this program will be supplemented by an anonymous donor's contribution of \$10,000 a year for the next three years.

Semiannual Meeting of Medical and Chirurgical Faculty.—The semiannual meeting of the Medical and Chirurgical Faculty of the State of Maryland was held at the Vindobona Hotel, Braddock Heights, Frederick County, September 28. Dr. Victor F. Cullen, acting president of the faculty, delivered the address of welcome. The speakers included:

- Dr. Royd R. Sayers, Washington, D. C., The Health of Workers.
- Dr. Harry H. Kerr, Washington, D. C., A Solution for Our Medical Economic Problem.
- Dr. Horace L. Hodes, Baltimore, Treatment of Pneumonia with Sulfapyridine.
- Dr. Robert H. Riley, Baltimore, The State Pneumonia Program.

Dr. Ridgely W. Baer, Frederick, president of the Frederick County Medical Society, also spoke.

MICHIGAN

Personal.—Dr. August C. Orr, who has been director of the child hygiene division of the North Dakota state department of health, has been appointed director of the sixth district of the Michigan State Department of Health with headquarters in Newberry.—Dr. Clark D. Brooks, Detroit, has been appointed a member of the Detroit Board of Education to serve the unexpired term of the late Dr. Angus McLean.

Society News.—The nineteenth annual Michigan Public Health Conference will be held at the Pantlind Hotel, Grand Rapids, November 8-10.—Dr. Fred J. Hodges, Ann Arbor, addressed the Genesee County Medical Society, Flint, September 27 on "Neoplasms of the Stomach."—Dr. Charles F. Geschickter, Baltimore, discussed "Conditions of the Breast" before the Calhoun County Medical Society, Battle Creek, September 5.

MINNESOTA

Personal.—Dr. Russell H. Frost, Wabasha, has resigned as superintendent and medical director of Buena Vista Sanatorium to accept a similar position at the G. B. Cooley Sanatorium, Monroe, La. Dr. Russell R. Hendrickson, St. Cloud, who was superintendent of Fair Oaks Lodge Sanatorium, Wadena, for several years, has succeeded Dr. Frost at Buena Vista.—Dr. Alloys F. Branton, Willmar, has been appointed executive secretary of the Minnesota Hospital Association.

Field Clinics for Crippled Children.—Field clinics were held in Worthington September 9, the first of a series conducted throughout the state by the bureau of services for crippled children of the state social security board. Cooperating with the bureau are the Minnesota Public Health Association, the division of rehabilitation of the state department of education and Gillette State Hospital. Other clinics were held in Hibbing September 16, Marshall September 23, Winona September 30 and Bemidji October 7. They will be held also at Fergus Falls October 28 and Mankato November 18. Mem-

bers of the Minnesota-Dakota Orthopedic Club are serving as clinicians. A letter from the attending physician of the patient is all that is required for entrance to the clinic, which is open to all physically handicapped children under 21 years of age whose parents cannot provide the needed care.

MISSOURI

Society News.—At a meeting of the St. Joseph Clinical Society in St. Joseph, September 14, Drs. Earl M. Shores, Jacob Kulowski and Leon Paul Forgrave presented a symposium on arthritis and Drs. Horace W. Carl, Judson M. Hughes and Frederick Gregg Thompson one on the acute abdomen. Dr. Winton T. Stacy discussed "Toxemias of Pregnancy." In the evening, Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*, spoke on "American Medicine and the National Government." This was a joint meeting and dinner with the Buchanan County Medical Society.

NEW JERSEY

Society News.—Dr. John A. Kolmer, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, in September on "Advances in the Treatment of Bacterial Diseases, with Special Reference to Sulfanilamide."—Dr. William Wolf, New York, addressed the Bergen County Medical Society at Englewood Hospital September 12 on practical endocrinology.

State Society to Investigate Deaths of Motorists.—The committee on traffic accidents of the Medical Society of New Jersey has asked county societies to investigate sudden deaths and illnesses of persons driving automobiles. The committee hopes by this means to determine which types of persons are potential hazards to themselves and others while driving a car. It is believed that data will be obtained that will be useful to the state motor vehicle department. A list of suggested questions to be answered in connection with each case was prepared by the committee. Among them were the following: If the case did not involve the death of the driver, what was the diagnosis of the illness? Would, in your opinion, a physical examination at the time the license was issued have revealed the diagnosis? Would the physical examination have revealed sufficient evidence to warrant a refusal of license on the basis that the driver might constitute a hazard to himself or to others? Should this driver have been denied a license on the basis of a known physical defect?

NEW YORK

Poliomyelitis in Buffalo.—Eight new cases of poliomyelitis reported in Buffalo September 28 brought the total number of cases in the current outbreak there to 273, with eight deaths. Opening of schools, scheduled for September 6, was postponed on the advice of the board of health. Schools in the adjacent towns of Batavia, Oakfield, Alden, Alexander and Pavilion have been closed after operating from two to three weeks. About forty cases have occurred in Batavia.

District Meeting.—The Third District Branch of the Medical Society of the State of New York held its annual meeting September 22-23 in Liberty. The speakers were:

- Dr. George G. Ornstein, New York, Diagnosis of Carcinoma of the Lung.
- Dr. Louis R. Davidson, New York, Pneumonectomy in Man.
- Dr. Jesse G. M. Bullowa, New York, Specific Therapy of the Pneumococcal Pneumonias.
- Dr. Arthur H. Blakemore, New York, Wiring and Electrothermic Coagulation of Aneurysms.
- Dr. Howard K. Thompson, Boston, Chronic Arthritis from the Standpoint of the Practicing Physician.
- Drs. Charles M. Carpenter and Stafford L. Warren, Rochester, N. Y., Biologic and Therapeutic Effects of Artificially Induced Fever.
- Dr. Clay Ray Murray, New York, Problem Fractures About the Elbow Joint.

Dr. Terry M. Townsend, New York, president of the state society, gave an address at an informal dinner.

New York City

Society News.—At the first stated meeting of the New York Academy of Medicine for this season October 5 the subject of discussion was "Treatment of Pyogenic Infections with Special Reference to Chemotherapy." Dr. Emanuel Libman introduced the discussion; Drs. Dallas B. Phemister, Chicago, and Edmund P. Fowler Jr., spoke on "Osteomyelitis" and "Otitis Media and Its Extensions," respectively.

Friday Afternoon Academy Lectures.—The fourteenth series of Friday afternoon lectures at the New York Academy of Medicine will begin November 10 with an address by Dr. John Russell Twiss on "Medical Management of Disorders

of the Biliary Tract." The series for the remainder of this year will be as follows:

- Dr. Harry Gold, Treatment of Cardiac Arrhythmias with Special Consideration of Paroxysmal Tachycardia.
- Dr. Richard A. Kern, Philadelphia, The Treatment of Visceral Allergies.
- Dr. Allen O. Whipple, Surgical Indications in Disorders of the Gallbladder.
- Dr. Alvan L. Barach, Recent Advances in Helium and Oxygen Therapy; Principles and Methods.

Diseases Under Investigation at Rockefeller Institute.

—The Hospital of the Rockefeller Institute for Medical Research announces the diseases now under investigation and invites physicians to refer cases suitable for study. These diseases are nephritis, heart disease, rheumatic fever, measles and acute respiratory diseases. Young children with nephrosis are especially desired and patients with nephritis in the initial acute stages will be accepted if space is available. Older patients with advanced heart disease, any early acute form of rheumatic fever, measles in the preeruptive stage, acute lobar pneumonia and bronchopneumonia in adults, both preferably in early stages, are also desirable. No charges are made for treatment, room, board or other services. Physicians should communicate with the resident physician before sending patients.

NORTH CAROLINA

New Dean at Nursing School.—Miss Margaret I. Pinkerton, superintendent of nurses at Barnes Hospital, St. Louis, has been appointed dean of the school of nursing at Duke University, Durham. Miss Pinkerton took the degree of bachelor of science in nursing from Teachers College, Columbia University, New York, in 1933 and held administrative positions at Stuart Circle Hospital, Richmond, Va., University of Virginia, Charlottesville, and Washington University, St. Louis, before going to Barnes Hospital.

Society News.—Dr. Franklin Webb Griffith, Asheville, addressed the Buncombe County Medical Society, Asheville, September 18 on "Urgent Surgery on Infants."—Dr. Joseph Lindsay Cook, Winston-Salem, addressed the Guilford County Medical Society, High Point, recently on "Advances in the Treatment of Syphilis."—Speakers before the meeting of the Catawba Valley Medical Society, Morganton, September 12 were Drs. Walter Eugene Daniel, Charlotte, on "A Comparison of Sulfanilamide, Sulfapyridine and Sulfanilyl-Sulfanilamide"; Joseph Samuel Holbrook, Statesville, "Recent Advances in the Diagnosis and Management of Cardiovascular Diseases," and Kenneth Lee Cloninger, Conover, who reported a case of myasthenia gravis.

OREGON

Society News.—Dr. Samuel G. Henricke, Portland, was elected president of the North Pacific Pediatric Society at a meeting in Spokane August 26; Dr. Morris L. Bridgeman, Portland, was made vice president and Dr. Jerald S. Backstrand, Salem, secretary.

State Medical Election.—Dr. Karl H. Martzloff, Portland, was chosen president-elect of the Oregon State Medical Society at the annual meeting in Gearhart September 6-9 and Dr. Charles E. Hunt, Eugene, was installed as president. Vice presidents elected were Drs. George E. Henton, Portland; Frank L. Ralston, La Grande, and Frank K. Power, Salem. Dr. Morris L. Bridgeman, Portland, was reelected secretary and Dr. James E. Buckley, Portland, was elected treasurer.

PENNSYLVANIA

Clinic Day Honors Hungarian Surgeon.—The Guthrie Clinic and the Robert Packer Hospital, Sayre, held a graduate clinic August 9 in honor of Dr. Lajos Adam, professor of surgery, University of Budapest. The speakers were:

- Professor Adam, Experiences with Local Anesthesia in General Surgery.
- Dr. William D. Stroud, Philadelphia, Coronary Disease Including Angina Pectoris and Its Differential Diagnosis from Gallbladder Disease; the Indications for Digitalis and Its Administration.
- Dr. John F. Erdmann, New York, Surgery of the Gallbladder.
- Dr. Walter E. Dandy, Baltimore, Injuries of the Head.
- Dr. Jesse G. M. Bullowa, New York, Treatment of Pneumonia with Sulfapyridine.

Society News.—Physicians from the University of Pittsburgh School of Medicine, Pittsburgh, presented a program before the Venango County Medical Society, Franklin, September 15. They were Drs. George J. Wright on "Gastrointestinal Manifestations of Neurologic Diseases"; Morris A. Hershenson, "Diagnosis and Medical Treatment of the Commoner Gastrointestinal Diseases"; John P. Griffith, "Indications for Surgical Intervention in Gastrointestinal Diseases," and Curtis C. Mechling, "Proctology for the General Practitioner."—Dr. Arthur C. Morgan, Philadelphia, addressed the Fayette County Medical Society, Connellsville, September 7 on

medical education.—Dr. Henry Joseph Tuncu, Philadelphia, addressed the Cambria County Medical Society, Johnstown, September 14 on "Management of an Irritable Colon."—Dr. Thomas R. Gagon, Pittston, addressed the Northampton County Medical Society, Easton, September 15 on "The Eye Findings in General Disease."—Dr. Lloyd E. Wurster, Williamsport, addressed the Lycoming County Medical Society, Williamsport, September 8 on "Opportunities for Mutual Benefit and Cooperation Between Roentgenologist and Practitioner," and Dr. Lee M. Goodman, Jersey Shore, reported a case of typhoid.—Dr. Calvin M. Smyth Jr., Philadelphia, addressed the Harrisburg Academy of Medicine September 19 on surgical diagnosis.

TENNESSEE

Society News.—Drs. Robert H. Miller, Memphis, and Robert S. Cowles, Greeneville, addressed the Greene County Medical Society, Greeneville, August 1 on "Some Points on the Mechanics of the Body, Especially the Lower Extremity" and "Tularemia" respectively.—At a meeting of the Hardin, Lawrence, Lewis, Perry and Wayne Counties Medical Society at Natural Bridge recently the speakers were Drs. John Howard King, Nashville, on "The Commoner Skin Diseases"; John H. Tilley, Lawrenceburg, "Traumatic Injury of the Liver with Report of a Case," and David W. Hailey, Nashville, "Undulant Fever."—Dr. Arthur R. Kempf, Springfield, discussed "Urogenital Diseases" before the Robertson County Medical Society in Cedar Hill recently. Dr. Bailey B. Sory entertained the members with a barbecue.—Dr. Guy Sydney McClellan, Nashville, addressed the Nashville Academy of Medicine and Davidson County Medical Society September 5 on leukorrhea, and Dr. Clarence S. Thomas, September 12, bronchiectasis.

TEXAS

Personal.—Dr. Albert M. Dashiell, Bryan, recently director of the fourth public health district, has been appointed field director of maternal and child health.—Dr. Clarence Burke Brewster, Fort Worth, has been made city health officer to succeed the late Dr. Arthur H. Flickwir. Dr. Isaac P. Barrett succeeded Dr. Brewster as health director of the public schools in Fort Worth.

Society News.—Dr. Frank C. Hodges, Abilene, addressed the Baylor-Knox-Haskell Counties Medical Society August 15 in Munday on "Fractures of the Hip."—Drs. R. R. Curtis and Joseph H. Greenwood, Temple, addressed the Bell County Medical Society recently in Belton on "X-Ray Diagnosis of Diseases Affecting the Chest" and "Vitamin K" respectively.—Dr. Henrie E. Mast, Lubbock, discussed cystoscopy at a meeting of the Lubbock-Crosby Counties Medical Society in Lubbock August 1.—Speakers before the Dallas County Medical Society, Dallas, September 14, were Drs. Charles B. Shuey on "Allergy"; Charles H. Warren, "Amebic Abscess of the Liver," and Paul M. Wolff, "Surgical and Nonsurgical Treatment of Women's Diseases."

VIRGINIA

New Health Officers.—Dr. Philip R. Cronlund, Washington, D. C., has been made health officer of Lee County to succeed Dr. James M. Suter, Jonesville, who will attend Johns Hopkins University for the coming year. Dr. William M. Moir, Indianapolis, replaces Dr. Earle C. Gates in Washington County and Bristol; Dr. Gates will also spend a year at Johns Hopkins. Dr. Thomas S. Englar, Baltimore, appointed in Albemarle County and Charlottesville, succeeds Dr. Robert D. Hollowell, who has gone to Shelby County, Tenn., and Dr. Marvin E. McRae, Richmond, succeeds Dr. Eugene B. Shepherd, Chatham, resigned, in Pittsylvania County.

WASHINGTON

Personal.—Dr. Floyd W. Baugh, Burlington, has been appointed health officer of Skagit County. Dr. Adolph J. Osterman, Mount Vernon, has served temporarily since the death of Dr. Benjamin F. Brooks.—Dr. William E. Steele, Longview, has been appointed chief medical adviser to the state department of labor and industries, a position he held several years ago.

Society News.—Dr. Paul G. Flothow, Seattle, addressed the Pierce County Medical Society, Tacoma, September 12 on "Affections of the Sympathetic Nervous System."—Drs. Robert D. Forbes and Cassius H. Hofrichter addressed the King County Medical Society, Seattle, October 2, on "Digestion After Gastric Resection" and "The Liver and Bile Passages from a Medical Standpoint" respectively.—Dr. Walter

L. Voegtlin, Seattle, addressed the Spokane County Medical Society, Spokane, September 14 on "Treatment of Alcoholism by Establishing a Conditioned Reflex." Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, addressed a special meeting of the society September 25.

WISCONSIN

Society News.—Drs. William H. Oatway Jr. and Reuben H. Stichm addressed the University of Wisconsin Medical Society, Madison, September 26 on "Mechanical Aids to Collapse Therapy in Pulmonary Tuberculosis" and "Subclinical Tuberculosis" respectively. Dr. Carl Erik Johan Hedvall, director of the tuberculosis clinic at the University of Lund, Sweden, was to have been the speaker but was compelled to leave for Sweden before the meeting.

GENERAL

Biological Abstracts Widens Scope.—Announcement is made that *Biological Abstracts* is undertaking a wider service in abstracting current research literature in bioclimatology and biometeorology. A new section "Bioclimatology-Biometeorology" will appear within the section "Ecology" under the editorship of Mr. Robert G. Stone, of the Blue Hill Observatory of Harvard University.

Allotment of Government Radium to Hospitals.—The first shipments of government-owned radium from the National Cancer Institute to hospitals have been made, the U. S. Public Health Service announced September 25. The entire supply of radium has now been allotted and no more applications can be considered until more radium is acquired. Eight Gm. is being lent and the remaining supply owned by the cancer institute, 1.5 Gm., will be used for research and for treatment of cancer patients at the Marine Hospital in Baltimore.

Bequests and Donations.—The following bequests and donations have recently been announced:

Presbyterian Hospital, New York, approximately \$843,000 by the will of Susan Dannatt Griffith.

Hospital for Joint Diseases, New York, about \$33,000 by the will of the late Fanny Bachrach.

Temple University Hospital, Philadelphia, \$22,000 by the will of Evelyn Shearer.

Women and Children's Hospital, Chicago, \$10,000 by the will of Mrs. Emma L. Dickinson.

Jewish Hospital, \$5,000; Lucian Moss Home for Incurables of the Jewish Hospital, \$7,500; University Hospital, \$1,000, all in Philadelphia; Eagleville Sanatorium for Consumptives, Eagleville, Pa., \$5,000, and National Jewish Hospital, Denver, \$1,000 by the will of Miss Rosa Cohen.

Two Impostors.—A Chicago physician has reported another case of the impostor who takes orders for surgical supplies. The man reported claimed to be a representative of Hayes and Company, Indianapolis, and took a deposit of \$2 on an order for surgical supplies. A letter addressed to the "Hayes" firm several weeks later was returned marked "undeliverable."

—From Michigan comes a report of a man who called on a physician to ask for a loan because his car had broken down. The would-be borrower claimed to be "Dr. Riley" of Flint and declared that he was a classmate of his victim, who lent him \$10. Becoming suspicious after the "classmate" left, the physician, who did not remember the man, looked him up in the medical directory and did not find his name. He immediately called his bank to stop payment on the check, but the check had already been cashed. Later it was found that other physicians had been victimized the same way.

Mead Johnson Award for Vitamin Research.—The American Institute of Nutrition announces that nominations will be received for the 1940 award of \$1,000 established by Mead Johnson & Co. to promote research on the B complex vitamins. The recipient will be chosen by a committee of the institute and the formal presentation will be made at the annual meeting in New Orleans March 13, 1940. The award will be given to the laboratory (nonclinical) or clinical research worker in the United States or Canada who in the opinion of the judges has published during the previous calendar year, January 1 to December 31, the most meritorious scientific report dealing with the field of these vitamins. If in the judgment of the committee circumstances and justice dictate it, the prize may be divided between two or more parties. It may also be recommended that the award be made to a worker for valuable contributions over an extended period but not necessarily representative of a given year. Nominations for work published in 1939 must be in the hands of the secretary by Jan. 5, 1940. The nomination should be accompanied by such data relative to the nominee and his work as will facilitate the task of the committee in its consideration. Leonard A. Maynard, Ph.D., Laboratory of Animal Nutrition, Cornell University, Ithaca, N. Y., is secretary of the institute.

Nine Leading Causes of Death.—The Bureau of the Census has made public a study of the 1,450,427 deaths reported in 1937 showing that nine groups of diseases caused 72 per cent of all the deaths. The causes are: diseases of the heart 23.9 per cent; influenza and pneumonia 10.2; cancer and other malignant tumors 10; nephritis 7.1; cerebral hemorrhage and softening 6.9; tuberculosis (all forms) 4.8; congenital malformations and diseases of early infancy 4.4; motor vehicle accidents 2.7, and diabetes mellitus 2.1. The report also classifies the deaths by age groups and presents the leading causes of death in each group. Congenital malformations and diseases of early infancy accounted for 51.4 per cent of deaths under 1 year. In early childhood (1 to 4 years) influenza and pneumonia led with 26.9 per cent. Influenza and pneumonia also caused most deaths in youth (5 to 19 years), 12.6 per cent, with motor vehicle accidents second, 10.9 per cent. From 20 years onward heart disease leads all other causes, with 18.7 per cent in the adult years (20 to 60) and 33.9 in the group 60 years and older. In the last two groups cancer is second with 11 and 12 per cent, respectively, of all deaths. Tuberculosis is a major cause of death in every age period except infancy; influenza and pneumonia appear at all ages. Drowning is an important hazard in the youth group alone and motor vehicle accidents loom largest at this age. In contrast to the 1,450,427 deaths, there were 2,203,337 births in 1937.

FOREIGN

Personal.—Drs. Alfred J. Clark, professor of materia medica, University of Edinburgh, Scotland, and Thomas R. Elliott, emeritus professor of medicine, University of London, have been appointed members of the Medical Research Council to succeed Prof. Henry S. Raper and John A. Ryle, who retire September 30, the *Lancet* reports.—Mr. William C. Wilson, director of the surgical research laboratory in the University of Edinburgh and of the surgical research unit in the Edinburgh Royal Infirmary, has been appointed to the regius chair of surgery at the University of Aberdeen, succeeding Dr. James R. Learmonth.

Deaths in Other Countries

Sir Frederick Spencer Lister, director of the South African Institute for Medical Research, Johannesburg, died September 6, aged 63.—Dr. George Redmayne Murray, emeritus professor of medicine, Victoria University, Manchester, England, died September 23 at Moberly, Cheshire, England.

CORRECTION

Head of Department of Pathology.—In the Educational Number of THE JOURNAL August 26, page 852, Dr. C. C. McClure, radiologist, Vanderbilt University Hospital, Nashville, Tenn., was erroneously listed as head of the department of pathology. Dr. E. W. Goodpasture is chief of that service.

Government Services

New Army Medical Officers

The following officers of the Medical Reserve Corps, U. S. Army, have been commissioned as first lieutenants in the Medical Corps:

Robert S. Anderson, Fort Myer, Va.	Alva E. Miller, St. Joseph, Mo.
Austin W. Bennett, Templeton, Calif.	Charles K. Morris, Binghamton, N. Y.
George S. Boyer, Fort Riley, Kan.	Myles P. Moursund, Silver Spring, Md.
James W. Brown, Whitefish, Mont.	Byron A. Nichol, Portland, Ore.
Leo J. Butler, San Francisco.	Lawrence A. Potter, La Crescenta, Calif.
Roosevelt Cafarelli, Amherst, Va.	Donald E. Reiner, Santa Maria, Calif.
Richard B. H. Dear, Fort Bragg, N. C.	Ralph E. Reiner, Santa Maria, Calif.
William N. Donovan, Fort Moultrie, S. C.	Hallman E. Sanders, Hot Springs National Park, Ark.
Carl N. Ekman, St. Paul.	Alton H. Saxer, Logan, Utah.
Wolcott L. Etienne, Washington, D. C.	Howard E. Sellards, Fort McClellan, Ala.
Everett C. Freer, Fort George G. Meade, Md.	Paul C. Sheldon, Terre Haute, Ind.
Wendell P. Harris, Hot Springs National Park, Ark.	Rolland B. Sigafos, Omaha.
Wilbur W. Hiehle, Ancon, C. Z.	John M. Talbot, Portland, Ore.
Kenneth E. Hudson, Yale, Okla.	Frederick C. Weekley, Dallas, Texas.
Robert L. Houghton, New Orleans.	Francis P. Wells, Washington, D. C.
Nathan F. Kane, Norfolk, Va.	
William W. Lister, Denver.	
George G. McShatko, Portland, Ore.	
Ralph L. Marx, Pawnee, Okla.	

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 16, 1939.

The Problem of Medical Literature

In a previous letter (THE JOURNAL, August 26, p. 868) a lengthy correspondence in the *Lancet* on the problem of medical literature, in which medical writers and medical librarians took part, was described. The problem is the extent of medical literature and the difficulty a writer has in gaining access to what has been written on a particular subject, notwithstanding the *Quarterly Cumulative Index Medicus* and the *Surgeon General's Index Catalogue*. One practical suggestion which emerged was the coordination of medical libraries, which has already been begun by four libraries in London. The correspondence has been continued and the *Lancet* has joined in the fray by an editorial entitled "The Mess of Medical Literature." Earlier in the year it estimated the number of scientific periodicals in the world as between 30,000 and 40,000. A large proportion of the papers in them—some would say three fourths—did not deserve to be published. An estimate was not given of the number of medical periodicals or of the proportion of their papers which do not deserve publication. Three suggestions were made by the *Lancet*: (1) some control over the volume of medical literature, (2) an effort to ensure complete indexing, (3) cooperation between abstracting journals to secure completeness without overlapping. Of the two great American indexes to which we are indebted, the *Lancet* says that the *Quarterly Cumulative Index Medicus* does not include all existing medical periodicals or the titles of all the articles in the indexed periodicals, and that the *Index Catalogue* is even less complete, invaluable as it is for early records. Prof. Samson Wright (physiologist) dissents and says that the *Lancet* seems to argue that we must make available a copy of every medical journal published and criticizes the *Quarterly Cumulative Index Medicus* for not noting all the papers printed. He suggests that there is a better case for reducing the number of journals taken by our libraries and for the abstracting journals not to extend but to limit their scope. There is no need to bother with the journals of small countries, as their writers know their weakness from the point of view of world publicity and publish any exciting discovery in English, French or German journals or write reviews or lecture on the subject abroad. But the problem remains what to do with the journals published in the half dozen principal languages. Many of these journals publish no original matter at all or very little of the slightest value. In a country like Germany, where medical publications are almost the monopoly of one firm, where editorial supervision has always been notoriously inadequate and where stress has always been placed on bulk rather than quality, more and more journals are becoming wholly or largely valueless as sources of original material. A group of committees of experts should be set up to report on the journals in each specialty. If a journal should fail to reach a reasonable standard of merit, the libraries should cancel their subscription to it and the abstracting journals should ignore it. No investigator of standing would then send any contributions to it. The same weapon could be used to control new journals. But we do need competent medical abstracting service in the English language. It is preposterous that a library should have to pay \$750 a year for an abstracting service in German. We need a journal like *Physiological Abstracts*, which covers the whole field of medical science excepting purely clinical papers. Its subscription is only \$16, while that of the German equivalent, which publishes the same number of abstracts, is \$150. An

annual subsidy of \$15,000 for three years would establish "English Medical Abstracts." The Royal Colleges of Physicians and Surgeons and the Royal Society of Medicine and various learned societies could provide this.

Medical Service for the Civilian Population

The central and local emergency committees of the British Medical Association will be responsible during the war for the supply of medical personnel for the fighting forces and for the civilian population. The allocation of practitioners for first aid posts at home for the treatment of casualties from air raids is now complete, and the appointments to the civilian hospitals are almost complete. The first aid posts have been set up with the intention of protecting casualty hospitals from a rush of minor and ambulant cases and of providing early treatment in districts where the hospital is some distance away. The function of the first aid post is (1) to treat and send to their homes those who are slightly injured and those suffering from nervous shock; (2) to arrest hemorrhage, relieve pain and so prepare persons who may be found to need institutional treatment that they can be transferred to the casualty hospital with the least possible harm. A physician will be in charge of each first aid post who has instructed the lay personnel workers under his control.

TETANUS ANTITOXIN

The Ministry of Health Emergency Service has recommended that as far as possible all persons with open wounds shall receive a prophylactic dose of tetanus antitoxin, which is being stored at more than fifty centers throughout England and Wales so as to be quickly available for use both at the first aid posts and at hospitals. While some authorities have advocated a prophylactic dose thrice that used with marked success in the great war, it is considered that a smaller one may be adequate. The dose recommended is therefore 2 cc. of the liquid serum provided, which at present represents 2,600 international units. This should be administered at the first medical unit at which the injured person is received. To avoid anaphylactic reactions, a second dose should not be given. The prophylactic antitoxin is in bottles containing fifteen or thirty doses. For treatment antitoxin is supplied in single sealed ampules containing not less than 20,000 (actually 24,000) international units in a volume not exceeding 8 cc.

GAS GANGRENE ANTITOXIN

Supplies of gas gangrene antitoxin are being held in the big centers throughout the country and will be available for surgeons whenever required. The arrangements allow for the administration of Welch, Vibron septique and Oedematiens antitoxins either separately or combined. While little is known regarding the dosage for prophylaxis and therapy, the provisional proposal, which may have to be modified in the light of experience, is to administer 1,000 units of Welch, 1,500 of Vibron septique and 1,000 of Oedematiens antitoxin as a combined injection for cases in which the surgeon desires to combine serum prophylaxis with surgical treatment. This combined treatment is contained in a volume not exceeding 10 cc. For treatment a combined injection containing not less than 7,500 units of Welch, 3,750 of Vibron septique and 2,500 of Oedematiens is recommended. For cases in which the causal organism has been identified, supplies of the separate antitoxins are available.

TREATMENT OF SPECIAL TYPES OF INJURY

It is proposed to provide special centers at which certain types of disability can be collected and treated by the appropriate specialist staff. But in the early stages of an emergency it is considered likely to be impracticable to switch over suddenly from a central peace-time to a decentralized war-time

organization. While, therefore, it will at first be necessary to treat any type of case at the advanced base hospitals, special centers will be established as soon as possible. In the case, however, of the neuroses uncomplicated by any injury, endeavor must be made from the outset to send those requiring special treatment to special institutions.

BERLIN

(From Our Regular Correspondent)

Aug. 21, 1939.

Report of Public Health Service in Germany

The report on the public health service, prepared by the division of public hygiene of the reich's department of the interior, has appeared. Austria and the Sudetenland are not included in the report. Officially the report is designated as "interpretative and determinative of the health development of the entire German people."

The number of marriages has somewhat increased (from 618,971 to 644,363; that is, from 9.1 to 9.4 per thousand), though the opposite was to be expected in view of the considerably reduced birth rate during the World War. Vital statistics pertaining to births yield the following figures: 1937, 1,275,212, in the whole country 18.8 per thousand; 1938, 1,346,911, in the whole country 19.7 per thousand. Families with two and three children still appear everywhere to be on the increase. The general mortality rate has remained almost unchanged (11.7 per thousand). Stillbirths and infant mortality have continued to decrease: 2.3 stillbirths per hundred born alive (2.4 per hundred in 1937); 6 per hundred infant deaths during the first year (6.4 per hundred in 1938). Individual causes of deaths of nurslings compared with those of 1937 show a slight reduction per thousand; syphilis, however, a slight increase of from 0.21 to 0.23. Mortality from intestinal catarrh receded from 5.72 to 5.59. Likewise, premature deaths resulting from premature births and low vitality were fewer (30.89 as compared with 32). While scarlet fever declined in the last three years, diphtheria showed a further advance. The increase in measles may signify the beginning of another rising wave. The same may apply to whooping cough, which however shows a heightened mortality. Epidemic meningitis has risen considerably: 1,826 cases in 1938 against 1,574 in 1937 and 1,322 in 1936. Nothing definite is known of the causative factors. Epidemic poliomyelitis has greatly increased, especially in the Rhenish and south German areas, but mortality has decreased.

The morbidity and mortality rates for tuberculosis have further declined; notably that of tuberculosis of the respiratory organs: tuberculous diseases in 1937 numbered 63,570; in 1938, 60,420. The morbidity rate for tuberculosis of the respiratory organs per 10,000 inhabitants was 8.9 in 1938 against 9.4 in 1937; the mortality rate was 5.4 in 1938 as compared with 6 in 1937. The total mortality rate for tuberculosis of all kinds was 6.3 in 1938 compared with 6.9 in 1937. Typhoid showed a further slight decrease in morbidity but took a relatively larger toll of lives (in 1938, 11.5 per hundred cases; in 1937, 9.9). Paratyphoid and epidemic dysentery show a similar picture. The morbidity and mortality rates for puerperal fever and febrile miscarriages have fallen somewhat except for puerperal fever in large cities (209 in 1938 against 192 in 1937). Deaths from influenza receded from 1.3 to 0.9 per 10,000 inhabitants. The nation was spared a more serious epidemic of influenza in 1938. However, more deaths occurred from pneumonia due to influenza (1937, 8; 1938, 8.3). The higher age levels, no doubt, account considerably for this increase. Other infectious diseases show a decreased morbidity status: Trachoma, which in 1935-1937 was represented progressively by 611, 620 and 697 cases, fell to 533. There were eighty-four cases of anthrax in 1938 against ninety in 1937 (six deaths against seven in 1937); thirty-seven cases of psittacosis against

twenty-two in 1937 (six deaths). Trichinosis appeared in twenty cases without mortality. In the government district of Aurich (province of Hanover) there were 345 cases of malaria.

The number of suicides in large cities remained the same: 3 per 10,000 (6,419 in 1938 against 6,217 in 1937); that of fatal accidents rose from 6,851 to 7,486 (3.3 in 1937, 3.5 in 1938 per 10,000 inhabitants). This increase is attributed more to the spread of industries than to traffic congestion; in fact, fatal traffic accidents were 3 per cent fewer than in 1937. On the other hand, the number of those injured on the streets has increased by 4 per cent, that of street accidents, in general, by 3 per cent. However, the use of automobiles also increased by 15 per cent. Traffic fatalities mounted to 7,404, injuries to 181,254. In general, health conditions are reported as favorable. Infant mortality, as mentioned, has decreased. In individual districts the figures fluctuate between 11.5 per cent in poor mountain regions and 3.8 per cent. Serious cases of rickets are almost completely absent in the report.

Excessive propaganda for the use of flour in the nutrition of children is complained of. The education of mothers in infant nutrition has to contend with old customs, especially in the country, and makes progress slowly. Desire on the part of mothers to nurse their babies usually ceases when the government premium is no longer paid. Sometimes the necessity for resuming work is the cause. Reports on preschool children are generally favorable. The report on children of school age, in spite of its generally favorable tenor, points out posture defects, a tendency to scoliosis and flatfoot. Dental caries continues to be an unsatisfactory problem. The report on conditions of the nation's youth criticizes chiefly immoderate cigaret smoking and premature manual labor.

The most unfavorable sections in the report on adults concern farmers' wives. Hard manual labor and birth frequency are assigned as the reasons. The increased need of houses caused by increase in marriages and better knowledge of sanitation is far from being met despite active building. Sanitation is not what it should be in many regions, partly because married women are engaged in outside work, partly because of the large size of the families. However, some of this is due to a certain scarcity of water. The former lack of beds and bedding has now disappeared almost everywhere. The report on venereal diseases refers to the fact that syphilis is found in relatively fewer cases but that gonorrhea has considerably increased in many districts.

No increase of mental diseases is reported. However, a heightened nervousness in youths and adults is recognized. "A decidedly unpleasant picture is presented in the statistics of the use of alcohol and nicotine." More favorable economic circumstances and heavy advertising are held responsible for this. The fight against narcotics has yielded good results.

In spite of the energetic steps taken the number of abortions is everywhere deplorably high. This has led to still more extensive investigations. In 1938 a large number of physicians, midwives and persons in ordinary walks of life were sent to jail or the penitentiary. The number of miscarriages is also surprisingly high and is not exclusively due to the use of abortion, but largely, both in country and town, to the exceedingly unfavorable environment in which very young primiparas as well as hard working multiparas often have to live.

Medical Pact Between Germany and Japan

Motivated by Germany's and Japan's cultural pact, an agreement suggested by Japan has been signed in Tokyo looking forward to an exchange of German and Japanese physicians. For this purpose Dr. Haedenkamp, leader of the foreign division of Germany's chamber of medicine, is now visiting in Japan. This medical pact is primarily planned to deepen the intellectual relations between the two nations. Individual features of this pact are the exchange of physicians, reciprocal information

regarding the application of medical methods and legislation pertaining to social politics and public hygiene. The pact is provisionally limited to three years. By means of this pact the cooperation between the two countries in the field of medicine, in operation for decades, is to be continued.

OSLO

(From a Special Correspondent)

Sept. 12, 1939.

Manganese in Factory Smoke and Pneumonia in Sauda

Some fifteen years ago Sauda, on the west coast of Norway, was noted for its salubrious qualities in spite of a heavy annual rainfall. But ever since electrical smelting of certain ores, some containing manganese, converted this rural community to an industrial town, pneumonia has been disturbingly frequent and characterized by a mortality of over 35 per cent. The general mortality of Sauda is still somewhat lower than that of Norway as a whole, thanks to the recent influx into Sauda of many young adults. But the morbidity from pneumonia is four times greater and the mortality eight times greater than in the rest of Norway. It has been calculated that between the ages of 15 and 29 the mortality from croupous pneumonia over a period of several years in Sauda is 22 per 10,000 living souls, whereas it is only 1 in Oslo and only 1 in the country taken as a whole. During the past fourteen years nearly one third of all the deaths in Sauda have been due to croupous pneumonia.

In 1928 the late Prof. Axel Holst conducted an inquiry into this mystery. Even then the manganese-containing smoke from the smelting furnaces was suspected, but the results of his observations were in conflict with this suspicion and he gave an open verdict as to the solution of the problem. In the autumn of 1929 his son, Dr. P. M. Holst, instituted prophylactic injections every autumn of a vaccine prepared from pneumococci obtained from local cases of pneumonia. But the results were disappointing. Between 1934 and 1937 Dr. Dagfinn Elstad sought to determine the part, if any, played by manganese in the persistence of a high pneumonia rate. Since the summer of 1938 Dr. Riddervold has conducted tests among both patients and healthy persons with a view to determining the types of pneumococci prevalent in the community. Now, in 1939, the evidence collected by Dr. Elstad seems to point to manganese as the chief offender, the more so because the production of manganese alloys from year to year since 1930 has followed a curve remarkably similar to those of the morbidity and mortality from pneumonia.

Meeting of Tuberculosis Specialists

Scandinavian tuberculosis specialists met this summer at Trondheim, where some 125 doctors took part in a discussion on the two main subjects on the agenda: (1) the relation between the primary infection and destructive pulmonary tuberculosis, and (2) the indications for thoracoplastic operations. With the genesis of pulmonary tuberculosis once more in the melting pot, it was not surprising that disagreement had to be noted with regard to the first item. Dr. Heimbeck, the president, voiced the opinions of the Norwegian school, which teaches that pulmonary tuberculosis usually begins with large, nonapical infiltrations. The Swedish school, represented by Dr. Malmros and Dr. Hedvall, attaches more importance to small, apical, initial foci as the beginnings of pulmonary tuberculosis. The other main subject, thoracoplastic operations, found the specialists less widely divided. From the Vardaaen Sanatorium, Norway, came a report to the effect that tubercle bacilli had been banished from the sputum and cavities had been closed in 76 per cent of the cases in which operation was performed. Attention was drawn to the superiority of the immediate results obtained with sanatorium patients over the immediate results obtained with patients operated on. Did this comparison, so

unfavorable to the surgical hospital, reveal defects in the after-treatment of patients handicapped by the atmosphere of a surgical ward?

Opinions at this meeting on Calmette's BCG vaccine were remarkably favorable. A Swede, Dr. Andersson, of Gothenburg, reported briefly on a follow-up examination of about 1,000 children who between 1927 and 1937 had been given prophylactic treatment with BCG. Not one of them was found to be suffering from tuberculosis. There was general agreement at the meeting as to the considerable, if not absolute, protection conferred on tuberculin-negative reactors by BCG vaccination, and approval was expressed of the suggestion that persons found to be tuberculin negative at and after puberty should be treated with BCG.

The Norwegian Red Cross

These are stirring days. Norway is not fighting in the war but it is already involved. Its merchant fleet, so large in proportion to the population of the country, must choose between starvation at home and great risks of sinking at sea. The choice was made unequivocally within a few days of the outbreak of war between Great Britain and Germany when the Norwegian Federation of Seamen issued a statement to the effect that the Norwegian seaman means to go to sea whatever happens. He will do so the more happily for the knowledge that at home every possible precaution is now being taken to ensure the safety of the country.

Colonel Meinich, president of the Norwegian Red Cross, on August 22 gave an address on the wireless about the Red Cross and the Geneva convention. Speaking in connection with the seventy-five year jubilee of the first Geneva convention, he reminded the public of the part the Red Cross has played and will continue to play in time of war. In the autumn of 1938, when war had seemed near, the Norwegian Red Cross issued an appeal for 1,886 men and women to volunteer for air raid precaution work. The response has been such that 1,097 men and 457 women have undergone the necessary training and are ready for service. The headquarters of the Red Cross in Oslo has issued instructions to every chapter to have in readiness a complete mobilization scheme, a copy of which is to be sent to headquarters. Such a mobilization scheme comes under two headings according as it deals with personnel or material. It may be noted in passing that through the League of Red Cross Societies (with its office in Paris), of which the Norwegian Red Cross is a member and Mr. Norman H. Davis is chairman, the Norwegian and American Red Cross societies are in touch with each other.

Marriages

CARL SCOTT LINGAMFELTER JR., Dumbarton, Va., to Miss Marguerite Mae Clarke of Richmond, August 5.

LEONHARD W. LEVISOHN, Cimarron, N. M., to Miss Edith Blumenthal of New York in Denver, June 4.

FREDERICK LOUIS LANDAU JR., Bronxville, N. Y., to Miss Hattie Belle Simons at Riverdale, June 17.

FREDERICK E. KOLB, Lake Linden, Mich., to Miss Lucile Plekenpol at Cedar Grove, Wis., July 1.

EDWARD E. HADDOCK, Richmond, Va., to Miss Katherine Lois Scott of Red Wing, Minn., July 31.

MATTHEW G. SANDERS, Fort Dodge, Iowa, to Miss Cecelia Maloney of Chicago, June 24.

RUSSELL L. LAYMON, Miami, Fla., to Miss Marjorie Rich in Washington, D. C., July 7.

CLIFFORD RIGBY, Rexbury, Idaho, to Miss Wilma Murley of Tacoma, Wash., July 6.

ERNEST F. GETTO, Du Bois, Pa., to Miss Olga Gagliardi of Jeannette, July 24.

OTIS H. LAW, Pontiac, Ill., to Miss Sue Field of Miami, Fla., May 14.

Deaths

Reginald Henry Jackson ☉ Madison, Wis.; Columbia University College of Physicians and Surgeons, New York, 1899; past president of the Medical Society of the State of Wisconsin; member and past president of the Western Surgical Association; member of the Southern Surgical Association; fellow of the American College of Surgeons; surgical preceptor, University of Wisconsin, 1914-1924, and clinical professor of surgery, 1924-1928; chief of staff, Methodist Episcopal Hospital; founder in 1912 and chief of staff of the Jackson Clinic; aged 63; died, September 7, at his summer home at Breese Point on Lake Mendota of coronary occlusion.

Samuel Calvin Smith ☉ Philadelphia; Jefferson Medical College of Philadelphia, 1905; fellow of the American College of Physicians; instructor in medicine at his alma mater, 1920-1922; served during the World War; consulting cardiologist to the Misericordia Hospital, 1925-1930, and the Chester County Hospital, West Chester; on the staff of the Veterans Administration Facility, Coatesville, 1931-1932; in 1928 was awarded the honorary degree of doctor of science from Bucknell College; aged 58; died, July 31, in the General Hospital, East Stroudsburg, Pa., of injuries received in an automobile accident.

Buckner Magill Randolph, Warrenton, Va.; Medical College of Virginia, Richmond, 1898; professor emeritus of clinical medicine at the George Washington University School of Medicine, Washington, D. C., clinical professor of medicine and director of clinics from 1922 to 1930, professor of materia medica and therapeutics, 1909-1922; chief of medical service of the Walter Reed General Hospital, 1917-1919; aged 67; died, July 1, at the Veterans Administration Facility, Washington, D. C.

Isaac Ernest Greenberg, Rockaway Beach, N. Y.; Long Island College Hospital, Brooklyn, 1916; member of the Medical Society of the State of New York; served during the World War; served at various times and in various capacities on the staffs of the Rockaway Beach (N. Y.) Hospital, Queens General Hospital, Jamaica, St. Joseph's Hospital, Far Rockaway, and the Long Beach Hospital, Long Beach; aged 47; died, July 22, of carcinoma of the rectum.

Mary Priestley Sheriff Rupert ☉ Bala-Cynwyd, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1904; formerly demonstrator of medicine at her alma mater, clinical professor of medicine and lecturer in nutrition and dietetics and founder of the laboratory of clinical pathology; fellow of the American College of Physicians; aged 59; died suddenly, July 21, in Portland, Maine, of cerebral hemorrhage.

Roy Groesbeck ☉ Salt Lake City; Western Reserve University School of Medicine, Cleveland, 1913; formerly member of the city board of health; lecturer in surgery at the University of Utah School of Medicine, 1917-1919, and since 1918 examining physician in the department of physical education; on the staff of the Dr. W. H. Groves Latter Day Saints Hospital; aged 50; died, July 5, of coronary occlusion.

Ellis S. Montgomery, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1890; member of the Medical Society of the State of Pennsylvania; past president of the Allegheny County Medical Society; fellow of the American College of Surgeons; formerly surgeon to the Baltimore and Ohio Railroad; aged 79; on the staff of the Passavant Hospital, where he died, July 12.

Joseph Thomas Welch, Long Branch, N. J.; Dartmouth Medical School, Hanover, N. H., 1893; veteran of the Spanish-American and World wars; past president of the board of health and a member of the board of education; on the staffs of the Royal Pines Hospital, Pinewald, N. J., and the E. C. Hazard Hospital; aged 72; died, July 23, of carcinoma of the breast.

Alfred Milton Mead ☉ Victor, N. Y.; University of Buffalo School of Medicine, 1880; past president of the Ontario County Medical Society; for many years town and village health officer; past president of the board of education; aged 82; for many years on the staff of the Frederick Ferris Thompson Hospital, Canandaigua, where he died, July 3.

Fred Dan Vickers, Deming, N. M.; Albany (N. Y.) Medical College, 1893; member and past president of the New Mexico Medical Society; at one time coroner of Montgomery County, N. Y.; past president of the Medical and Surgical Association of the Southwest; formerly on the staff of the Deming Ladies' Hospital; aged 71; died, July 27.

Dozier Henry Gibbs * Los Angeles; Vanderbilt University School of Medicine, Nashville, Tenn., 1917; member of the American Urological Association; fellow of the American College of Surgeons; on the staffs of the Hospital of the Good Samaritan and the Children's Hospital; served during the World War; aged 43; died, July 10.

James William Ward, San Francisco; New York Homeopathic Medical College, New York, 1883; fellow of the American College of Surgeons; past president of the city board of health; formerly dean and professor of gynecology at the Hahnemann Medical College of the Pacific; aged 78; died, July 12, of coronary occlusion.

Austin Maurice Curtis, Washington, D. C.; Northwestern University Medical School, Chicago, 1891; professor of surgery, Howard University College of Medicine; past president of the National Medical Association; served in various capacities on the staff of the Freedmen's Hospital; aged 71; died, July 14, of cerebral hemorrhage.

William Walter Cross * Oakland, Calif.; Washington University School of Medicine, St. Louis, 1897; member of the American Urological Association; on the staffs of the Alta Bates Hospital and Berkeley General Hospital, Berkeley, and the Peralta Hospital; aged 66; died, July 12.

Thomas Stewart Dickson, Houlton, Maine; Bellevue Hospital Medical College, New York, 1893; member of the Maine Medical Association; past president of the Aroostook County Medical Society; medical director of the Aroostook Hospital; aged 71; died, July 13, of uremia.

John Francis Sagarino * Hartford, Conn.; Columbia University College of Physicians and Surgeons, New York, 1913; fellow of the American College of Surgeons; served during the World War; on the staff of St. Francis Hospital; aged 50; died, July 21, of cerebral hemorrhage.

Augustus Savage Lowsley, Flushing, N. Y.; Medical College of Virginia, Richmond, 1917; surgeon emeritus on the staff of the Flushing Hospital; aged 53; died, July 17, in the Community Hospital, Long Beach, following an operation for a ruptured appendix.

Walter Allen Hodges * Pasadena, Calif.; St. Louis University School of Medicine, 1905; served during the World War; medical director and superintendent of the LaVina (Calif.) Sanatorium; aged 57; died, July 22, of cerebral hemorrhage.

Augustin Aloysius Wolfe, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894; member of the Medical Society of the State of New York; aged 77; died, July 10, of chronic myocarditis.

Charles Derastus Thomas * Peoria, Ill.; Rush Medical College, Chicago, 1888; fellow of the American College of Surgeons; on the staff of the Proctor Hospital; trustee of Bradley College; aged 75; died, July 18, of myocarditis.

Jenner Perry Chance, Carmel, Calif.; Minneapolis College of Physicians and Surgeons, 1900; veteran of the Spanish-American and World wars; aged 68; died, July 3, in the Veterans Administration Facility, West Los Angeles.

Chester Harold McCallum, Erie, Pa.; Jefferson Medical College of Philadelphia, 1905; member of the Medical Society of the State of Pennsylvania; aged 58; on the staff of St. Vincent's Hospital, where he died, July 15, of pneumonia.

Perry McDowell Tibbins, Beech Creek, Pa.; Jefferson Medical College of Philadelphia, 1905; member of the Medical Society of the State of Pennsylvania; bank president; aged 58; died, July 29, of peritonitis following appendicitis.

Daniel John Milton Miller, Ventnor, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1878; member of the American Pediatric Society; aged 82; died, July 6, in the Bryn Mawr (Pa.) Hospital.

Isaac Evans Nash * Port Chester, N. Y.; University and Bellevue Hospital Medical College, 1924; at one time chief of the urological service, Harlem Hospital, New York; aged 40; died, July 27, of coronary sclerosis.

James Hugh Hackett * Milwaukee; University of the City of New York Medical Department, 1894; aged 74; for many years on the staff of St. Mary's Hospital, where he died, July 23, of carcinoma of the stomach.

Alexander Thomas Leonard, San Francisco; L.R.C.P., Edinburgh, and L.R.C.S., Edinburgh, 1882; member of the California Medical Association; fellow of the American College of Surgeons; aged 81; died, July 2.

Charles Benjamin Hare, Los Angeles; Rush Medical College, Chicago, 1908; fellow of the American College of Surgeons; served during the World War; aged 66; died, July 2, of peritonitis following an operation.

William Henry Palmer, Janesville, Wis.; Chicago Medical College, 1882; fellow of the American College of Surgeons; aged 78; formerly surgeon to the Mercy Hospital, where he died, July 29, of heart disease.

Francis M. Kujawa * Buffalo; University of Buffalo School of Medicine, 1917; served during the World War; aged 46; died, July 12, in the Buffalo General Hospital of coronary occlusion and arteriosclerosis.

Bert Lynn Savitz * Shanksville, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1931; aged 33; died, July 12, in the Somerset (Pa.) Community Hospital of embolism and pneumonia.

Eugene Ernest Simpson, Shreveport, La.; University of Louisville (Ky.) Medical Department, 1896; aged 68; died, July 7, at Rochester, Minn., of laceration of the jugular vein, self inflicted.

Lenore Leeds Doughty, Cincinnati; Miami Medical College, Cincinnati, 1906; aged 56; died, July 5, in the General Hospital, Saranac Lake, N. Y., of spontaneous subarachnoid hemorrhage.

James Wesley Harper, Pittsburgh; Medico-Chirurgical College of Philadelphia, 1910; member of the Medical Society of the State of Pennsylvania; aged 53; died, July 19, of coronary occlusion.

Emmet Leo Reilly, Pittston, Pa.; Temple University School of Medicine, Philadelphia, 1937; on the staff of the Pittston Hospital; aged 27; was killed, July 25, in an automobile accident.

William Staughton Snow, Middletown, Ohio; Pulte Medical College, Cincinnati, 1896; member of the Ohio State Medical Association; aged 66; died, July 28, of cerebral hemorrhage.

Ray Nelson Lewis, Apollo, Pa.; University of Louisville (Ky.) Medical Department, 1909; served during the World War; aged 63; died, July 16, of a self-inflicted bullet wound.

William Henry Whitehead, Austell, Ga.; University of the City of New York Medical Department, 1876; aged 83; died, July 10, of uremia and chronic nephritis.

Robert Lee Kimmins, Meridian, Texas; Missouri Medical College, St. Louis, 1887; at one time physician to the city schools of Beaumont; aged 72; died in July.

Adolf Natzler * Los Angeles; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, Germany, 1907; aged 56; died, July 4.

James Robert Norrel, Indianapolis; Cleveland College of Physicians and Surgeons, 1898; aged 64; died, July 20, of bronchopneumonia.

George Hector Craig, Broadview, Sask., Canada; Manitoba Medical College, Winnipeg, 1905; aged 63; died, July 18, of coronary sclerosis.

George W. Smith, Peoria, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1887; aged 76; died, July 13, of pneumonia.

Knute Olai E. Heimark * Duluth, Minn. (licensed in Minnesota in 1899); aged 65; died, July 17, of bronchopneumonia.

Thomas William Wilson, Moscow, Pa.; Eclectic Medical Institute, Cincinnati, 1895; aged 66; died, July 31, of heart disease.

Jasper S. Stone, Healdsburg, Calif.; Medical College of Ohio, Cincinnati, 1873; Civil War veteran; aged 92; died, July 4.

James B. Clay, Dyersburg, Tenn.; Meharry Medical College, Nashville, 1900; aged 68; died, July 25, of diabetes mellitus.

Ephraim George Hughes * Long Beach, Calif.; Jefferson Medical College of Philadelphia, 1907; aged 59; died, July 7.

Zachary Fuller, Bandera, Texas; State University of Iowa College of Medicine, Iowa City, 1876; aged 85; died in July.

George Roy Galloway, Avery, Okla.; University Medical College of Kansas City, Mo., 1896; aged 67; died, July 4.

CORRECTION

Dr. Shaw Not Dead.—Dr. George Flanagan Shaw of Toronto, Ont., whose death was reported in THE JOURNAL September 2, page 959, is not dead. His death was erroneously reported by the College of Physicians and Surgeons of Ontario.

"THYOGLAND TABLETS"

Thyrex Tablets (for Toxic Goitre)

Sodium Bicarbonate	0.05	Gm.
Sodium Arsenate	0.001	Gm.
Sodium Phosphate	0.12	Gm.
Salol	0.10	Gm.
Sodium Bromide	0.05	Gm.
Calcium Oxalate	0.05	Gm."

"THYOGLAND TABLETS"

Glandex Tablets (for Toxic Goitre)

Pituitary Gland (desiccated)	0.05	Gm.
Suprarenal Gland (desiccated) USP.....	0.05	Gm.
Pancreas (desiccated)	0.05	Gm.
Corpora Lutea (desiccated)	0.05	Gm."

One tablet of this and one Thyrex tablet were to be taken together before meals.

At the hearing of the Carver case the Post Office presented scientific evidence which showed that goiter cases are divided between toxic and nontoxic and that there are many cases of swelling of the neck in the region of the thyroid gland which the layman might easily mistake for goiter even though they had no relation to it; and, further, that the information furnished by those who filled out the question blank would not enable even a physician properly to diagnose the case and prescribe the necessary treatment in all types of goiter. In addition, the expert testimony brought out that in certain types of toxic thyroid the administration of Carver's treatment would be dangerous, in spite of the promoter's claims to its being "a safe remedy"; that it might change a case of simple goiter to one of a toxic or dangerous type, and that, where there are changes in the tissue of the thyroid gland due to the disease of hyperplasia extending over a long period of time, the condition would not respond to any medical treatment.

The Solicitor, in commenting on Carver's claim that his offer to refund the price of the treatment to dissatisfied users eliminated the possibility of fraud, pointed out that this same contention is made by the promoters of practically all fraudulent mail order schemes, and that the customer, even should he succeed in getting his money back, has nevertheless been defrauded in having been given false hopes; and, further, that in some cases the customer may not discover he has been swindled and so may not seek a refund.

Carver, while admitting he was not qualified as a physician, claimed he had read a number of books on goiter and had been associated with certain physicians during the operation of his business. He presented several affidavits from physicians in which it was stated that they had used the Thyogland Treatment in goiter cases and that it was their opinion, based on this experience, that the thing would have some value in goiter. Carver admitted he had written these affidavits himself and then got the physicians to sign them.

For these and other reasons the Solicitor recommended to the Postmaster General that a fraud order be brought against Lyell Carver, and it was issued on Sept. 24, 1938. It now remains to be seen whether Carver will again bob up in the field of mail order quackery operating under a new trade style and exploiting a new "cure."

In closing it may be worth mentioning that a list of complaints ordered by the Federal Trade Commission from June 10, 1929, to April 15, 1930, against certain concerns and individuals for making false claims for their respective wares included the name of Lyell C. Carver.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Happy Day Headache Powders.—Gulf Laboratories Co., Inc., Lafayette, La. Composition: In each powder, approximately 2.4 grains of acetanilid, 3.2 grains of aspirin, 0.4 grain of caffeine, and 0.2 grain of phenolphthalein, with milk sugar and citric acid. Fraudulent therapeutic claims.—[N. J. 28707; November 1938.]

National Pain Relief.—National Medicine Co., Nashville, Tenn. Composition: Essentially extracts of plant drugs including red pepper and ginger, a small amount of an ammonium compound, camphor, chloroform, alcohol (4.2 per cent by volume), glycerin and water. Fraudulently represented as a remedy for dysentery, diarrhea, fluttering of heart, shortness of breath, etc.—[N. J. 28988; November 1938.]

Seeqit.—Seeqit & Tiques, Inc., New York. Composition: Tablets each containing about $4\frac{3}{4}$ grains of aminopyrine and $\frac{3}{8}$ grain of caffeine. Fraudulently represented as a harmless remedy for menstrual discomforts and as a product endorsed by many physicians.—[N. J. 28679; November 1938.]

Correspondence**DISTURBANCES OF THE PENDULAR
MOVEMENT OF THE ARM
IN WALKING**

To the Editor:—A short time ago Robert Wartenberg (A Cerebellar Sign, THE JOURNAL, April 15, p. 1454) reported his observations on the decrease or cessation of the arm-swinging movement in walking in cases of homolateral disease of one of the cerebellar hemispheres. After considering similar observations by Holmes, Thomas, Marburg, Dusser de Barenne and others, Wartenberg designated this phenomenon as "cerebellar sign" and concluded his discussion by saying that "it would be of interest to study the swinging movement of the arm in unilateral frontal disease." I had occasion to observe this phenomenon in two cases of unilateral injury of the frontal brain:

1. A man aged 42 was wounded in the left side of the forehead by a shell splinter in 1916. Examination in 1932 revealed in the middle of the left side of the forehead a scar with a bone defect covering the middle of the first and second convolutions of the left lobe of the frontal brain. The patient showed signs of disturbance of frontal equilibrium on the contralateral side, such as past pointing with the right arm, rocking and falling to the right and, besides, a contralateral deviation in going forward and a homolateral deviation in going backward. In this case, in which no other disturbances of the pyramidal motor or the sensory system were manifested, the swinging movements of the contralateral arm in walking were markedly reduced in comparison with the other arm.

2. A man aged 44 had been similarly wounded in 1917 by a shrapnel bullet in the left side of the forehead above the eyebrow. On examination in 1932 a scar 7 cm. long and 4 cm. wide was found on the left frontal bone going obliquely upward from the lateral corner of the eye and gradually narrowing toward both ends. The bone defect corresponded to the second and third convolutions of the frontal brain. This patient presented, besides the sign of heterolateral disturbance of frontal equilibrium similar to that of the first patient, a habitual bending of the head to the right shoulder and an automatic resumption of this attitude on passive change of the position of the head. Along with an otherwise entirely intact motor and sensory system he manifested a complete loss of the swinging movement of the contralateral arm in walking.

Both of these cases, which were discussed at greater length in connection with their bearing on the phenomenon of question (Halpern, L.: On the Disturbances of the Pendular Movement of the Arm in Walking, Harefuah 7:ii [May-June] 1933) and on the problem of the relation of the frontal brain to equilibrium (Halpern, L.: Ueber das Symptomenbild der Stirnhirnläsion unter spezieller Berücksichtigung der Störungen des Gleichgewichts, Monatschr. f. Psychiat. u. Neurol. 94:13 [Sept.] 1936), indicate (a) that disturbances of the swinging movement of the arm do occur also in cases of involvement of the frontal brain and (b) that in cases of unilateral injury

of the frontal brain this disturbance is manifested in the swinging movement of the contralateral arm in walking.

A comparison of my observations with those of Wartenberg indicates further that the disturbance of the swinging movements of the arm is not of pathognomonic significance for the cerebellum but constitutes a symptom of disturbance in walking which is manifested homolaterally or contralaterally according to whether the cerebellum or the frontal brain is involved. Finally, these observations prove that frontocerebellar cooperation covers not only the regulation of static equilibrium but the balancing of the body in walking and certainly the performance of walking in general.

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STANDARDIZATION OF BLOOD PRESSURE READINGS

To the Editor:—The special article on this subject in *THE JOURNAL* July 22 induces me to emphasize paragraph 5. Equal and not excessive pressure should be made by the bell of the stethoscope in taking the blood pressure. Particularly in children, and occasionally in adults in whom the blood pressure is low, especially when the diastolic blood pressure is low, it is necessary to place the bell of the stethoscope in such a manner that the entire ring of pressure is equal and that the upper ring of the bell does not press harder than the lower. If the upper half of the ring of the pressing bell of the stethoscope should be pressed harder, the pulse beat will continue to be heard long after the true diastolic point has been reached. The extra pressure of the bell of the stethoscope acts in the same manner as if there were an increase of pressure in the cuff. The pulse beat can also be heard without the cuff by pressing the upper segment of the stethoscope bell or diaphragm on the artery.

The interpretation of the Korotkow sounds of auscultatory blood pressure estimation may be simply explained in the following manner: The radial pulse is felt because it strikes the obstructing finger just as the vibration of a board held in the hand can be felt when struck by a wave or by a fist. Similarly the sound of the blow can be heard. When the cuff is pumped up tightly to beyond the systolic blood pressure, the artery beneath the cuff is completely compressed and the pulse wave is stopped at the upper end of the cuff. No pulse can be felt nor sound heard in the antecubital space because the muscle does not transmit sound well, certainly not at the 12 cm. distance of the cuff. When the pressure is released sufficiently so as to permit the blood stream to carry and transmit the sound created by the pulse wave striking the obstruction, i. e. the partially compressed artery, one can hear the sound (Korotkow) or feel the pulse. This transmitted sound of the pulse wave striking the obstruction is heard until there is no more obstruction. This occurs when the pressure in the cuff is about equal to that in the artery. There being no obstruction, the pulse wave continues uninterrupted and no vibrating element is in the way. The point at which the sound disappears should be considered the diastolic pressure.

From this simple exposition of the cause of Korotkow sounds, one can see that excessive pressure of the upper segment of the bell of the stethoscope can be the means of producing sounds at the antecubital fossa, as may other obstructions either within or without the artery.

E. I. FOGEL, M.D., Cincinnati.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HYPERGLYCEMIA AND DIABETES

To the Editor:—1. Why is it desirable, if it is desirable, to maintain a normal blood sugar level other than to prevent ketosis in the treatment of diabetes? 2. (a) What harm can result (when ketosis is omitted) from a persistent hyperglycemia in a diabetic subject and what is the mechanism that brings this about? (b) How is the relationship between hyperglycemia of diabetes and the complication of diabetes proved (when ketosis is omitted)? 3. What should be the objectives in the treatment of diabetes in the aged and in those who are not aged?

M.D., New York.

ANSWER:—1. Normal blood sugar values are obviously the best. In diabetes a normal percentage of sugar in the blood, as a rule, indicates a blood normal in other respects as well. Thus far, no one has ever reported a series of 100 or more cases of diabetes with known hyperglycemia for ten years in which there has been freedom or even relative freedom from serious complications of diabetes or, indeed, freedom from evidence of progression in the diabetes as manifested by loss of weight, strength and ambition. Irrespective of the different ideas regarding dietetic treatment, there has been in the past unanimous agreement in the insistence on aggressive measures to attain normal values for blood and urine.

2. (a) Persistent hyperglycemia implies persistent glycosuria, except in the few cases in which there is a high renal threshold. Hyperglycemia and glycosuria involve accessory annoyances such as polydipsia and polyuria, the attendant necessity for extra food to make up for the loss of calories in the urine and the obvious wear and tear on the system for ingestion, assimilation and excretion of this unutilized extra food.

Hyperglycemia is a constant stimulus to the islands of Langerhans of a pancreas already impaired and overburdened. It allows no time for recuperation such as the pancreas of a healthy person enjoys between meals and at night.

Such patients are less resistant to infections even though the mechanism is not surely demonstrable by bacteriologic tests.

They acquire more complications than diabetic patients who are controlled.

Diabetes is not static and Naunyn's dictum still holds that many a case originally was mild but neglected.

Statistically, the duration of life in cases of uncontrolled diabetes is shorter than in cases of controlled diabetes.

If hyperglycemia is allowed, one yardstick is lost by which to measure the status of the patient. There are variables enough in the management of diabetes without the addition of high blood sugar of uncertain degree throughout the day.

(b) It is not proved directly, but there is no more reason for disregarding this signal of something being wrong than to fail to stop at a red light at a railroad crossing because one cannot see the train around the corner. It is granted that one may not be able to explain by laboratory methods that the person with uncontrolled diabetes has a lowered resistance to bacteria, but the great frequency of infections in diabetic patients with hyperglycemia is acknowledged. No one claims that hyperglycemia is responsible for all the complications of diabetes. Diabetes is a deficiency disease, and when the condition is brought under control by a correct adjustment of diet and insulin (either endogenous or injected) the occurrence of diabetic complications becomes rare.

3. The objectives in the treatment of diabetes are the maintenance of comfort, vigor, a reasonable weight within the normal zone or slightly below, and control of glycemia and glycosuria, although all agree that chemical meticulousness is to be avoided to prevent the exposure of the patient to hypoglycemic reactions.

The same rules hold for old and young relatively. Thus, if complete control of carbohydrate utilization is sought, it is obvious that the total dextrose excreted in the young will be considerably more than that in the old because of the larger diets of youth.

HEMIPLEGIA FROM CONTRALATERAL VASCULAR
ACCIDENT

To the Editor:—A man aged 54, short, stocky and overweight, had a tension averaging 150 systolic and 90 diastolic prior to onset of the following: An attack of influenza lasting one week left the patient weak for several weeks. The blood pressure at this time rose no higher than it had previously. From two to three weeks after the "flu," according to the history, the patient began to complain of some difficulty in speaking, and occasionally he broke out with crying spells. Later the patient became highly excitable, cried freely and complained of speech difficulty and weakness of the right arm and hand. Examination revealed a blood pressure of 210 systolic, 100 diastolic, weakness of the hand grasp on the right side, absence of the abdominal reflex on the right side and a suggestive Babinski sign elicited by the right foot. Diagnosis at the time was possible cerebral thrombosis affecting the left middle cerebral artery or its branches, possible angiospasm or a frank hemorrhage of a smaller vessel. The only significant laboratory work revealed a mild diabetic condition, later verified by repeated chemical analyses of the blood, urinalyses and the like. Diet, medication and rest in the course of time helped bring about an apparent "cure," with this exception: The right arm and especially the hand is swollen, edematous and painful to such an extent that the patient is unable to use this member. Pain at the shoulder is complained of. Various physical therapeutic measures at first seem to reduce the swelling but with recurrence. I am at a loss to explain this phenomenon unless he may have a thrombosis of the right axillary vein. Any suggestions will be appreciated. Henry Rosner, M.D., Brooklyn.

ANSWER:—The manifestations of right-sided hemiplegia with spasticity in a diabetic patient aged 54 certainly speak for a contralateral vascular accident in the brain. The finding of a painful edema of the hemiplegic extremity without any venous obstruction is not uncommon. The insufficient venous return may be explained by diminished muscular activity and the increased vasodilation in the hemiplegic limb. It is possible, however, that an axillary thrombosis followed the venous stasis, but in that case a palpable cord in the axilla or marked increase in the size of the cutaneous veins around the shoulder and the anterior wall of the chest should be found. The injection of an opaque substance such as skiodan or diodrast into the cubital vein followed by the taking of an x-ray film readily demonstrates the patency or block of the axillary vein.

Elevation of the edematous limb on pillows together with the administration of a mercurial diuretic, such as salyrgan or mercupurin, helps to empty the arm of the excessive fluid. The pain in such extremities is usually considered to be thalamic; mild sedatives hardly influence it. Repeated injections of procaine hydrochloride into the stellate ganglion may help to relieve both the edema and the pain.

CHAULMOOGRA OIL AND TUBERCULOSIS

To the Editor:—I should like information regarding the use of chaulmoogra oil in tuberculous infections of the bronchi, trachea, larynx, pharynx or nose, whether by application or inhalation of spray. What strength is used and with what frequency? What type of the oil or similar substances or derivatives from these are used? What toxic effect are to be avoided and how? What results are to be expected?

M.D., Pennsylvania.

ANSWER:—Chaulmoogra oil has been found to have approximately a hundred times the bactericidal effect found in phenol, as far as the acid-fast bacteria are concerned. The active principle of chaulmoogra oil is in its acids, which inhibit the proliferation of the leprosy bacillus and the tubercle bacillus.

In treating tuberculosis the ethyl esters were at one time administered in doses of 3 cc. by mouth. However, patients did not tolerate this treatment well and the substance was then administered intramuscularly. This often resulted in intense pain, induration and inflammation at the site of injection. It was next administered intravenously with an initial dose of 1 cc. once a week, and later the intervals were increased to from two to four weeks.

Various methods of local application were also employed. For example, Bronfin and Markel treated fifty cases of tuberculous laryngitis with local applications of chaulmoogra oil and the ethyl esters of the oil. Their observations extended over a period of from ten to twelve months. The two forms of the drug were used in different cases and were administered intratracheally beginning with 5, 10, 25 and 50 per cent of the drug mixed with pure liquid petrolatum. The authors were unable to note any difference in action of the two forms. They did not observe an aggravation of symptoms, as had been reported by some authors, or an improvement, as other authors had reported. However, they did notice an increase in the local ulceration in some cases, which they believed was due to the irritating effects of the drug. In no case was there observed a decrease in the cough or sputum. Apparently the only possible effect that chaulmoogra oil could have would be a germicidal action on the tubercle bacilli that have been set free and lodged on the lining

of the bronchi, trachea, larynx, pharynx or nose. This is of no significance as far as the actual disease in these parts is concerned, however, since the preparation does not reach the depths of the lesions.

Unfortunately, there is no proof available that chaulmoogra oil has any beneficial effect in the treatment of tuberculosis in any form. Moreover, it has been shown that chaulmoogric acid does not penetrate tubercle. Therefore, chaulmoogra oil has been almost entirely abandoned in the treatment of tuberculosis.

References:

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POTENTIAL HERNIATION

To the Editor:—In examining men for employment I have been considering a bulging through the inguinal canal on effort as a hernia. I consider such as an incomplete hernia and in executing a waiver just put down "rupture." Am I wrong in making such a diagnosis? No one seems to agree with me that a hernia exists. Will you settle this matter for me? I do not wish to do an injustice to any man and want to be fair with both employee and employer. M.D., Connecticut.

ANSWER:—A bulging in the inguinal canal is frequently spoken of as a bubonocoele. The term is confusing rather than helpful. Conditions of this nature are often called "potential hernias." All men have potential hernias. In 33 per cent a bulging high up in the inguinal canal can usually be detected.

Conditions of this kind are generally symptomless, and unless a palpable mass protrudes beyond the fascial pillars forming the external opening of the inguinal canal they should not be considered as being "ruptures." When there is a persistence of symptoms, operation is sometimes recommended. Rarely a small cyst may be found within the inguinal canal, and frequently a large pedunculated pad of properitoneal fat is responsible for the symptoms. In industrial work, for a symptomless bulging which does not extend beyond the inguinal canal what is sometimes spoken of as a "prophylactic herniotomy" is not recommended. If instructions were given to the men to keep the legs together when doing heavy lifting and avoid awkward positions, a large number of industrial hernias probably would be avoided.

In inguinal hernias of the direct type it is more difficult to determine when an abdominal weakness actually becomes a hernia unless there is an area of bulging which can be seen as well as felt, particularly in comparison with the unaffected side. These conditions are not usually considered as being a definite herniation and it is believed that such men should not be rejected for employment.

OBSTETRIC DEATHS

To the Editor:—What in your opinion constitutes an excusable obstetric death? Of course I realize that those instances of violence or other conditions which place the case in the medical examiner's jurisdiction must be excluded from the list. M.D., New York.

ANSWER:—In assessing the responsibilities for obstetric death, many different factors must be considered: first, the patient; second, the attendant, usually a physician, and third the institution or home conditions and undeterminable factors. If, for instance, the patient neglected to report to a physician or, after having reported, neglected to follow his instructions relative to the proper care of herself, as in eclampsia, one would say that that was an excusable death from the standpoint of the physician but not from that of the patient. In other words the death would be assessed to the patient and not to the physician. If, on the other hand, the patient followed the physician's advice and died from eclampsia and it was decided that the treatment was not adequate, the death would be assigned to the physician.

If the patient died from infection acquired during confinement, and improper or inadequate technic was used, it would be considered an inexcusable death. If, on the other hand, all proper precautions were taken and the patient died from sepsis, it would be an excusable death and the physician would not be charged with it. It would probably be assigned to undeterminable causes. If a patient enters an institution and dies from hemorrhage, and proper equipment is not available nor prompt and adequate treatment of the hemorrhage, the death would be assigned to the institution. If on the other hand, all facilities were available and used and the patient died, it

would be considered an excusable death, especially if the patient was admitted in a moribund condition not having been under the care of a physician or not entering the institution in time to afford proper opportunity for therapeutic measures.

An excusable death from the standpoint of obstetric practice would therefore be one in which there had been proper cooperation between patient, agency and physician and in spite of intelligent and sufficient treatment being used death occurred. It is difficult to define excusable in general terms, since each case must be properly evaluated and considered on its merits in connection with the environment and the circumstances involved.

TONSILLECTOMY VERSUS ELECTROCOAGULATION

To the Editor:—Please tell me the modern attitude on the problem of the surgical removal of tonsils versus the removal by electrocoagulation.

M.D., Connecticut.

ANSWER.—It is fair to say that the best opinion today favors the surgical removal of tonsils. There are times when electrocoagulation is useful, particularly in the aged and the debilitated and when small remnants are to be removed. The reason electrocoagulation is not used oftener is probably that it requires numerous sessions and that it is exceedingly difficult to tell when one has done too much or too little. Bleeding may occur just as it does following surgical removal, and this bleeding is more often of an obstinate type and starts as long as two weeks after the intervention. Lastly, there is always the possibility of an infected piece of tonsil being buried beneath a heavy scar, which may cause more trouble than the untreated tonsils did originally.

MILIARIA RUBRA OR PRICKLY HEAT

To the Editor:—Since living in south Texas, for the last two summers, I have been suffering from prickly heat (*miliaria rubra*). Remedies recommended by both medical and lay friends have been of no avail. I have tried alcohol sponging, followed by the so-called Mexican heat powder labeled to contain camphar, zinc oxide, boric acid and starch; I have used several other powders; I have bathed in water with sodium bicarbonate; I wear the lightest possible cloth; I have taken all kinds of laxatives. There has been no relief of the prickly heat, except for a short time. What is known as to the pathophysiology of *miliaria rubra*? I noticed a peculiar bitter taste of my perspiration when suffering from *miliaria*. Is it a metabolic disturbance? Can you recommend any remedies other than those mentioned, with some hope for relief? Is there any literature on the disturbance?

M.D., Texas.

ANSWER.—This query centers around the treatment of *miliaria rubra* (prickly heat), but a more intimate description of the eruption would be advisable to make sure that this diagnosis is correct. Does it occur only in the covered parts or are the exposed surfaces also affected? Is the rash accompanied by hyperhidrosis (excessive sweating)? Are there any other factors, e. g. external irritation, which may contribute to its chronicity? Perhaps another careful dermatologic examination may disclose some important points which have been overlooked.

Miliaria rubra is generally conceded to be a disorder due to occlusion of the sweat ducts, which may be due to swelling of epithelial cells unprotected by sufficient oil. There is accompanying dilatation of the capillaries and sweat ducts in the cutis, and vesicle formation may appear in the malpighian layer—the latter phenomenon is not connected with the sweat apparatus. *Miliaria* is not due to a metabolic disturbance but it may occur secondarily, in hot weather or climate, to hyperhidrosis, which may be associated with one of many general diseases, among which the metabolic must be included. If excessive sweating is evident one should search for its cause and eliminate or control it, if possible, thereby removing one important factor in the cause of *miliaria rubra*. The condition may be complicated in some persons by all varieties of eczema and intertrigo, and these must necessarily be cleared up. A *miliaria*-like eruption is known to occur as a dermatophytid secondary to a ringworm infection, perhaps of the toe webs, especially in highly sensitized persons. Occasionally contact with external irritants or the ingestion of drugs may produce a condition resembling prickly heat.

Soothing preparations are of especial value, preferably lotions and powders. Starch, almond meal or bran water may be applied and the area then dried and dusted with 10 per cent boric acid powder in equal parts of zinc oxide and starch. A thick calamine lotion with or without phenol may be tried. Sodium bicarbonate 1:200 may be used or may be incorporated in the calamine lotion. From 3 to 5 per cent solution of coal tar in calamine lotion may relieve the pruritus. An aqueous solution of aluminum chloride starting with 10 per cent and increasing, if necessary, to 25 per cent may control the perspiration.

NO SERUM FOR EPILEPSY

To the Editor:—Is there a qualified physician in Missouri who treats epilepsy with some kind of serum and supposedly gets good results? Is there any federal hospital for epileptic patients in the country? A girl aged 15 has epilepsy. The mother has heard that there is some one in or near Missouri who has had these good results. Is there any place outside of a state hospital where this girl could be adequately treated without too much expense? I shall appreciate any information that you can give me along this line.

M.D., North Dakota.

ANSWER.—No ethical, qualified physician would attempt to treat epilepsy with a serum, since there is no recognized serum treatment of this disease. All the recent medical literature on epilepsy recommends treatment with the ketogenic diet, dehydration, phenobarbital and diphenyl ethyl hydantoinate. The treatment can be effectively carried out by any qualified family physician.

There is no federal institution for the care of epileptic patients. This child would be best treated by a pediatrician or internist whom the family physician knows to be interested in epilepsy.

SCARRING AND PAIN IN JAW

To the Editor:—A patient aged 55 had a radical operative procedure performed in the left floor of the mouth for a malignant condition nine years ago. There is no evidence of recurrence, but at short intervals of about two weeks he has attacks of severe pain in the region of the lower part of the left jaw. This is made worse by swallowing. The pain is incapacitating and at times the patient becomes despondent. All forms of therapy are of little avail. The cause of the pain seems to be scar tissue, at which there is a great deal. Any therapeutic procedures will be appreciated.

Thomas Dechairo, M.D., Westmoreland, Kan.

ANSWER.—It would seem that the large amount of scar tissue in this area might well involve some nerve branches and, on swallowing, some traction might cause pain. One should also exclude a recurrence of the original growth. Spasmodic occlusion of the submaxillary duct, evidenced by an acute swelling of the submaxillary salivary gland, should also be eliminated.

Hot wet applications for an hour at a time twice a day and anodynes followed by exercise in an effort to soften the scar tissue may relieve the pain.

POISON IVY AND MILK

To the Editor:—When game farms plant poison ivy along stone walls to furnish berries for winter food for birds, it is found that farm animals destroy the crop by browsing in dry seasons. If people drink milk from cows fed on poison ivy leaves, would there be any tendency toward developing immunity after drinking such milk? Would there be less injury to the kidneys from injection of extracts as a defensive measure?

Robert T. Morris, M.D., Stamford, Conn.

ANSWER.—It is theoretically possible that the active principle of *Rhus toxicodendron* is secreted in milk. This, however, has not been demonstrated. It would be much simpler if one were to try oral immunization to give the tincture of *Rhus toxicodendron* by mouth, so that a known dose is given. This method of immunization is seldom used. Its value is questionable.

Regarding the inquiry dealing with kidney injury, it is assumed that the inquirer has in mind the possibility of such damage through the injection of therapeutic and prophylactic doses of the extract of *Rhus toxicodendron*. No such harm occurs from ordinary doses.

PAIN AND ANALGESICS

To the Editor:—A patient for the past five years has been taking daily about twenty tablets of empirin compound. I have tried to take them away from him but after a day he is wild with the pain in his head and if it is made impossible for him to get any he is semidelirious. I can find no real help in the literature I have at hand and would like advice as to the best method to use in this case.

M.D., Massachusetts.

ANSWER.—A patient suffering from such pain needs, of course, a careful diagnostic examination to determine the cause of the pain to secure its relief by remedying the cause. If it cannot be done and the pain is located in a definite peripheral nerve territory, its relief by injection of a local anesthetic should be attempted; if this is unsuccessful, injection of alcohol or, what is more permanent, nerve resection should be employed. Until the pain has been relieved by either of these means, the patient is entitled to some analgesic, and it is desirable to change the analgesic formula from time to time so as to minimize the danger of unfavorable results on the system from prolonged use of any one drug as well as to lessen the neces-

sity of increasing the dose because of habituation. Empirin compound is the non-Council accepted proprietary name of Burroughs-Wellcome & Co. for a mixture of acetylsalicylic acid $3\frac{1}{2}$ grains (0.22 Gm.), phenacetin (acetophenetidin) $2\frac{1}{2}$ grains (0.16 Gm.), and caffeine one-half grain (0.03 Gm.).

DOG BITES AND RABIES

To the Editor:—My attention has been directed to the reply that was given to Dr. Collins of Seattle concerning the treatment of bites by rabid dogs, which appeared on page 1283 of *The Journal*. As one who has had considerable experience with rabies, both human and animal, clinical and experimental, I feel that I must disagree with the opinions expressed. They are also at variance with the opinion of all authorities with which I am familiar in the matter of the value of efficient cauterization. I would like to have specific references to those who believe that cauterization is a method " . . . which was considered proper treatment in the days of Ambroise Paré but which thinking persons have abandoned just as did Paré." If the vaccination were 100 per cent effective it would be a different matter, but it is not always successful in bites destined to have a short incubation period. I have witnessed three human deaths which might have been prevented had cauterization been applied. Cauterization must always be with pure nitric acid. Phenol and iodine are not acceptable.

W. H. Kellogg, M.D., Berkeley, Calif.

To the Editor:—On page 1283 of the April 1 issue of *The Journal* the idea is put forward that dog bites should not be cauterized but should preferably be cleansed with soap and water and irrigated with a warm salt solution. It is an almost universally recognized procedure in health departments to cauterize dog bites with fuming nitric acid unless circumstances make it quite clear that there is no need to fear rabies. The health departments also recommend this procedure to all practicing physicians in their respective areas as the only approved method of preliminary treatment. Is *The Journal* taking a stand against nitric acid cauterization? If so, it is surely desirable that this question should be discussed at much greater length. Health officers are bound to have difficulty with practicing physicians over the subject of treatment at dog bites unless it is discussed with sufficient fulness so that both groups will know what stand is being taken by *The Journal* and will be made acquainted with the reasons for that stand. If the general practice of health departments is wrong, it is quite possible that they will change it, but not until there are good and sufficient reasons for doing so.

J. L. Pameroy, M.D., Los Angeles.

To the Editor:—In *The Journal* April 1, page 1283, a discussion of the indications for antirabic vaccination appeared. This discussion has certain possibilities of doing harm. A statement which I think is particularly dangerous reads as follows: "When the wound resulting from a bite is treated immediately and carefully in this fashion the administration of antirabies serum is not advocated in all instances." This sentence appears after the paragraph deploring cauterization of dog bites and recommending thorough cleansing with soap and water. This seems to me to place too much reliance on local treatment, no matter what the nature of the treatment may be. It is certainly dangerous to imply that the bite of a rabid animal should not be followed by antirabies vaccine unless specific indications are given. I myself am unacquainted with any bite of a known rabid animal resulting in a definite wound which should not be followed by antirabies vaccine. The published statement may tend to encourage careless practice with unnecessary danger to some individuals.

Ralph S. Muckenfuss, M.D., New York.

ANSWER.—Particulate matter introduced into the soft tissues is carried away rapidly by the lymphatics; in fact with such startling speed that brilliant dyes injected into the skin of the forearm can be recognized as high as the axilla in eight minutes, and injection of the lymphatics over an area several inches in diameter about the site of the inoculation takes place within as short a time as eighty seconds. These facts were graphically set forth by Hudack and McMaster in a series of papers in the *Journal of Experimental Medicine*, and an editorial calling attention to their reports appeared later in *THE JOURNAL*. It is therefore pertinent to ask whether one could hope to destroy by any local application all of a virus which had been carried into the deeper layers of skin and subcutaneous tissues when some of it is far out of reach within a few moments of the time of inoculation.

The second point is that powerful chemicals destroy tissue just as quickly and certainly as they could destroy any virus or bacterial contamination. Since it is illogical to think that all of the contaminating material could be destroyed, no matter how thorough the cauterization, because a part of it is already beyond reach of local treatment, it seems reasonable to think that the destroyed and devitalized tissue would make development of infection and increase of contamination greater instead of less. Certainly this has been demonstrated many times as far as bacterial infection is concerned. Whether the same reasoning can be applied directly to the problem of rabies is not established with certainty.

In answer to Dr. Muckenfuss's comments it should be pointed out that at no time has it been implied that a patient bitten by a rabid animal should not receive Pasteur treatment. In such an event the immediate and careful cleansing of the wound would be followed promptly by administration of antirabies vaccine.

The whole subject needs further experimental investigation.

—Ed.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in *THE JOURNAL*, September 30, page 1353.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written.* Part I. Various places throughout the United States and Canada, Feb. 15. *Oral.* Part II. Philadelphia, Oct. 14-15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Philadelphia, Nov. 3-4. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written examination and review of case histories (Part I) for Group B candidates will be held in various cities of the United States and Canada, Jan. 6. Applications for admission to Group B, Part I, examinations must be on file not later than Nov. 15. General oral and pathological examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 8-11. Applications for admission to Group A, Part II examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).*

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities of the United States and Canada, March 9. *Oral.* New York, June 10. Formal applications must be received before Jan. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Boston, Jan. 20-21. Applications must be filed on or before Nov. 1. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PATHOLOGY: Memphis, Nov. 22-23. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics. Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, December. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlanta, Ga., Dec. 9-11. Sec., Dr. Byrl R. Kirklind, 102-110 Second Avenue S.W., Rochester, Minnesota.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. (The only examination session to be held in 1940.) Case reports must be submitted not later than November 9. Sec., Dr. Gilbert J. Thomas, 1009 Nicolet Ave., Minneapolis.

North Carolina June Report

Dr. W. D. James, secretary, Board of Medical Examiners, reports the written examination held at Raleigh, June 19-23, 1939. The examination covered sixteen subjects and included eighty-four questions. A general average of 80 per cent was required to pass. Fifty-seven candidates were examined, all of whom passed. Twenty-four physicians were licensed by reciprocity and five physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical . . . . .	" "	.... (1939)	90.1, 92.3, 94.6
University of Color . . . . .	" "	.... (1939)	88.3
Howard University . . . . .	" "	.... (1937)	92.2
(1938) 87.1, 89.9			
Emory University School of Medicine		(1939)	91.1
University of Georgia School of Medicine		(1939)	85
Northwestern University Medical School		(1939)	91.8
Tulane University of Louisiana School of Medicine		(1939)	81.1
87.4, 92.6, 93.8			
University of Maryland School of Medicine and College of Physicians and Surgeons		(1939) 83.5, 84.3, 86.4, 89.5	90.7
Harvard Medical School		(1939)	85.5
Washington University School of Medicine		(1939)	90.2
Duke University School of Medicine		(1933)	
(1938) 93.4, (1939) 85.3			
University of Cincinnati College of Medicine		(1939)	88.4
Jefferson Medical College of Philadelphia		(1939)	85.9
86.2, 88.4, 89.1, 89.4, 90.6, 92.5			
Temple University School of Medicine		(1939)	80.2
82.5, 87.3, 88.1, 88.9			
University of Pennsylvania School of Medicine		(1937)	90.6
(1939) 85.4, 85.4, 88.3, 90.7, 91.6, 91.8, 93.9			
Medical College of the State of North Carolina		(1939)	90.5
University of Tennessee College of Medicine		(1938)	91.3
Vanderbilt University School of Medicine		(1939) 85.2, 85.2	86.1
Medical College of Virginia		(1939) 85.2, 86.1	
89.6, 90.2, 90.9			

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University School of Medicine		(1938)	Virginia
Howard University College of Medicine		(1937)	Tennessee
Emory University School of Medicine		(1935)	Georgia
University of Georgia School of Medicine		(1938)	Georgia
State University of Iowa College of Medicine		(1927), (1937)	Iowa
University of Kansas School of Medicine		(1937)	Kansas
University of Louisville School of Medicine		(1935)	Kentucky
University of Louisville School of Medicine		(1936)	Louisiana
University of Louisville School of Medicine		(1935)	Maryland
University of Louisville School of Medicine		(1937)	New York
University of Louisville School of Medicine		(1937)	W. Virginia
Temple University School of Medicine		(1937)	Penn.
Woman's Medical College of Pennsylvania		(1912)	
Medical College of the State of South Carolina		(1935)	South Carolina

University of Minnesota Medical School.....	(1934), (1935)	Minnesota
Eclectic Medical University, ..	(1904)	Missouri
St. Louis University School ..	(1927)	Missouri
Washington University Scho ..	(1913)	Illinois
University of Cincinnati Coll. ..	(1938)	Ohio
Western Reserve University ..	(1934)	Ohio
University of Oklahoma School of Medicine.....	(1924), (1937) Oklahoma	
University of Oregon Medical School.....	(1937)	Oregon
Jefferson Medical College of Philadelphia.....	(1920), (1932)	Penna.
Vanderbilt University School of Medicine.....	(1936)	Tennessee
University of Texas School of Medicine.....	(1937)	Texas
Medical College of Virginia.....	(1927)	N. Carolina
Marquette University School of Medicine.....	(1936)	Illinois
(1938) Ohio		
University of Wisconsin Medical School.....	(1937)	Missouri

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Dr. R. N. Whitfield, assistant secretary, Mississippi State Board of Health, reports the written examination held at Jackson, June 21-22, 1939. The examination covered twelve subjects and included ninety-six questions. A general average of 75 per cent was required to pass. Twenty-one candidates were examined, all of whom passed. Sixteen physicians were licensed by reciprocity. The following schools were represented:

Dr. Henry J. Gramling, secretary, Wisconsin State Board of Medical Examiners, reports the written and practical examination held at Milwaukee, June 27-29, 1939. The examination covered twenty subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-seven candidates were examined, all of whom passed. Thirty-six physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939)	84	
University of Southern California School of Medicine.....	(1939)	86	
University of Georgia School of Medicine.....	(1938)	87	
Loyola University School of Medicine.....	(1939)	81	
Northwestern University Medical School.....	(1938)	88,	
(1939) 85, 86, 86, 86, 86, 87, 87	(1938)	83, 86	
Rush Medical College.....	(1938)	87	
School of Medicine of the Division of the Biological Sciences.....	(1938)	89	
University of Illinois College of Medicine.....	(1939)	86, 87	
University of Louisville School of Medicine.....	(1938)	85	
Harvard Medical School.....	(1938)	83,*	
University of Minnesota Medical School.....	(1938)	87	
83,* 86*	(1936)	82	
University of Nebraska College of Medicine.....	(1936)	87	
University of Rochester School of Medicine.....	(1938)	87	
University of Oregon Medical School.....	(1937)	86	
Temple University School of Medicine.....	(1938)	83	
University of Pennsylvania School of Medicine.....	(1938)	85	
Medical College of Virginia.....	(1936)	84	
Marquette University School of Medicine.....	(1939)	84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 87, 87, 87, 88, 88, 88, 88, 89, 89, 89	
University of Wisconsin Medical School.....	(1935)	85,	
(1936) 84, (1937) 85, 88, (1938) 83, 83, 84, 84, 84, 84, 85, 85, 86, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 87, 87, 88, 88, 88, 89, (1939) 85, 86			
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Georgia School of Medicine.....	(1937)		Georgia
" " " " " "	(1928)		Illinois,
" " " " " "	(1904),		
" " " " " "	(1921)		Illinois
" " " " " "	(1927)		Indiana
State University of Iowa College of Medicine.....	(1934), (1936), (1937) Iowa		
University of Michigan Medical School.....	(1933).		
(1934, 2), (1935) Michigan			

Sports for the Handicapped. By George T. Stafford, Ed.D., Associate Professor of Physical Education, The University of Illinois, Urbana. Cloth. Price, \$2.75; school price, \$2. Pp. 302, with 17 illustrations. New York: Prentice-Hall, Inc., 1939.

This book aims to present to all concerned with the education of the handicapped a method of teaching that will motivate the atypical student to improve not only his physical condition but also his outlook on life. The percentage of handicapped children is large enough to warrant serious attention. Most books on sports are for the normal children. This deals with sports for the handicapped or abnormal. These recreative activities should have the following criteria: 1. The activity should have some corrective or ameliorative value for particular functional defects. 2. It should have a minimum of "expectancy of injury" or aggravation of the handicap. 3. It should have some recreative value for the individual with either functional or structural defects. The book takes up the different handicaps, such as partial handicaps, more complete disability, functional and organic heart disease, amputations, ankylosed joints, endocrine dysfunctions, debilities following long chronic illness or short acute illness, muscular deficiencies, foot defects, malnutrition, flaccid and spastic paralyses, respiratory and nasal disturbances, postural defects and spinal curvatures. The author tells the kinds of sports that these different students should take up and then goes into detail as to exactly what sports and how vigorously they should be indulged in. The book is well written and the subject thoroughly taken up. There are many illustrations. This book should be useful to those interested in or working with this class of students.

Chirurgisch-orthopädische Sportambulanz. Von Herbert Pirker, Dr. med., Leiter der Chirur. Abt. des St. Rochusspitals Wien, und H. Wunderlich, Dr. med. habil., Facharzt für Orthopädie in Leipzig. Paper. Price, 27.60 marks. Pp. 391, with 195 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

The point of view and scope of this book are best brought out in the preface. Sport surgery, it indicates, is defense surgery in time of peace. A thorough training in sport surgery must be assumed as a necessity for every physician who (it matters not in what place or in what community) has a care for the cultivation and maintenance of the power of self defense among his people. For this reason sport surgery must occupy an important place wherever physicians or students wish to secure the proper knowledge required by their activities in defense situations or, in fact, by their practice in any community which has a high regard for defense preparation. The idea of the book came to expression during the surgical defense courses for physicians during the war situation in Vienna. In the darkest "illegal" times, during the winter of 1934-1935, the planning and work for this book began, and the political events of recent years in the German-Austrian territory were associated with it to the time of its completion. Foreseeing subsequent political developments, three persons came together in the late autumn of 1937: a German publisher, a Leipzig orthopedist and a Vienna surgeon. They planned this book to offer all that might be required for the practicing physician (whether he was the best situated sport physician in a city or in a popular resort or a country doctor who was compelled to make use of the most primitive resources) in the way of recognizing and treating injuries acquired during sports.

It was taken for granted that it is necessary for every practical physician to be personally concerned with the treatment of such injuries and that the idea is untenable that every more serious joint sprain requires treatment in a hospital.

The authors have tried to bring into this book all the important scientific doctrines of recent years which have offered a new biologic consideration of injuries to the apparatus of movement in such a way that they will be woven into a book with purely practical ends and will be easily grasped. Gymnastics and training sports and all therapeutics must be so treated that the reader recognizes at first glance what needs to be done. No method may be so complicated that in its application injurious passive movements may arise through unskilful handling. Yet suitable attention must be allowed to the many demands which a fully trained clinician would call for.

The authors take up in an orderly way the various methods of diagnosing and modes of treating sport injuries in general. Then they cover the different sports, with their characteristic injuries. After this the different parts of the body are considered in detail with regard to traumatic lesions common to them. The symptoms, diagnosis, prognosis, treatment and aftercare are described for many of the more important conditions.

The book is well gotten up, the printing and paper are excellent and the illustrations, including the reproductions of roentgenograms, are produced with characteristic efficiency. If there is any criticism, perhaps there are not enough details with regard to treatment.

Clinical Pathological Gynecology. By J. Thornwell Witherspoon, B.S., B.A., M.D. Cloth. Price, \$6.50. Pp. 400, with 271 illustrations. Philadelphia: Lea & Febiger, 1939.

A new textbook on gynecology added to the already crowded list! This book, although presenting the latest in ovarian tumors, is incomplete and sketchy. The author in his preface states that the book is designed for the medical student as a correlator between gynecologic pathology and clinical gynecology. For this purpose it may serve well, but even the pathology is not complete enough to give a good background. The illustrations of gross and microscopic pathologic changes are excellent, as are those showing patients with various endocrine disorders. The bibliography is remarkably incomplete, and even such a subject as vaginitis due to *Trichomonas vaginalis* is completely ignored. Witherspoon uses this text to propound his pet theories on stimulation by the estrogenic hormones as the cause of various gynecologic disorders, a fact that decreases the value of the book for the average student, who should get broader views.

Die Koronarinsuffizienz. Von Professor Dr. Franz Büchner, Direktor des Ludwig-Aschoff-Hauses, des Pathologischen Institutes der Universität Freiburg/Br. Kreislauf-Bücherei, Band III. Herausgegeben in Verbindung mit der Deutschen Gesellschaft für Kreislauforschung. Paper. Price, 6 marks. Pp. 88, with 49 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1939.

In this short monograph the author develops the argument that coronary insufficiency constitutes an important form of heart disease. By coronary insufficiency is meant an inadequate blood supply to the heart relative to the work that it is doing. This coronary insufficiency may be acute or chronic and it may lead to heart failure. The electrocardiogram expresses coronary insufficiency through its abnormalities, particularly by deviations of the S-T segment. Anatomically the evidence of coronary insufficiency is found in microscopic focal regions of degeneration and necrosis disseminated through the area which was ischemic. Clinically the expression of the coronary insufficiency is anginal pain. Coronary insufficiency may arise (1) through mechanical interference with coronary blood flow, (2) through impairment in the quality of the coronary blood as far as its oxygen content is concerned or (3) through an increase in the work of the heart with which the coronary blood supply cannot keep pace. Cardiac hypertrophy, as the author points out, belongs to the last type. The monograph is well documented, and the arguments presented are quite convincing and in accord with the newer concept prevailing in this country. The only section which does not come up to the excellent standard is that dealing with the theory of the electrocardiographic changes in these conditions. This monograph is illumi-

nating of the trend of the times, since in it a pathologist admits that disease can occur because of functional disturbances and not necessarily because of an anatomic change. The author has helped to coordinate the structural disorders with this physiologic-clinical syndrome by demonstrating that coronary insufficiency has its anatomic signs. However, the pathologists must look carefully for this microscopic evidence. This monograph should be carefully read by those interested in the field, since it contains an excellent summary of Büchner's important contributions to the subject.

Clinique et pathologie comparée: Vénérologie, cancérologie, dermatose, médecine générale, phyto-pathologie. Par Louis Bory, chef de clinique de la Faculté de médecine de Paris à l'Hôpital Saint-Louis. Préface du Dr Flessinger. Paper. Price, 50 francs. Pp. 239. Paris: Masson & Cie, 1939.

The concepts of disease and medicine underlying this novel and interesting treatise are as broad as the concept of life itself. The only adequate scientific basis for medicine is that which views disease as an essential attribute of all organisms. Until the science of medicine recognizes this basic fact it proceeds without recognition of the evolution of diseases in the course of man's long ancestry. His diseases have evolved along with this ancestry and have left a part of their record in the organisms which have survived with man in the struggle for existence. Comparative pathology illumines the path of the evolution of human diseases. Even the reactions of plants to infection and functional disorders shed light on problems of immunity, resistance, recovery and death. The author approaches this subject through the field of dermatology, a logical approach because of the accessibility of the skin of man to the same or comparable infections as those which affect mammals. The book is divided into chapters on the venereal diseases of animals, syphiloid of the cat and human granulomatoses, tumors, cancers and leukoses, itch and demodiciasis, neoscrofula, paratuberculosis and paraprosoy, dermatoses, infectious icterus, the comparative pathology of epilepsy, the professional hazards of veterinarians and phytopathology. In a prophetic section on les maladies d'avenir, the author forecasts the increasing medical importance of brucellosis, psittacosis, icterohemorrhagic spirochetosis, infectious anemia of the horse, septic pyohemia, echinococcosis and diphtheria, all infectious and all associated with the biocenosis created by human society and the integrated animal life. The author advocates a fusion into one system of all instruction pertaining to animals and human beings in order that both may benefit from the comparative approach to clinical pathology. Even plant pathology has its contribution to make, notably in the field of the virus diseases. They too have their bacterial, fungous and nematode enemies and their necroses, tumors, immunities and processes of healing. This is a thought-provoking book. Its point of view is the logical social corrective for the opposition to medical research. It puts disease in its actual setting in relation to nature as a whole.

Medical Entomology with Special Reference to the Health and Well-Being of Man and Animals. By William B. Herms, Professor of Parasitology in the University of California, Berkeley. Based on the book known as "Medical and Veterinary Entomology." Third edition. Cloth. Price, \$5.50. Pp. 582, with 196 illustrations. New York: Macmillan Company, 1939.

The text is completely rewritten, based on the author's Medical and Veterinary Entomology (edition 2, 1923). In the interval of sixteen years much new material has become available in medical entomology. This is true especially in the fields related to public health, notably with reference to two of the greatest plagues of mankind, malaria and bubonic plague, both with insect vectors, the ubiquitous mosquito and the pestiferous flea, respectively. The book makes extensive use of the results of experiments and of the relation to public health of various insects. Nearly 100 pages deal with mosquitoes alone, discussing their classification, life history, food, flight, longevity, biting habits, mating and oviposition, and the special characteristics of the more banal species. Keys to the genera of culicids and to the species of anophelines of the United States are provided. A chapter is devoted to mosquitoes as vectors of disease. In addition to the three malarias they are the vectors of filariasis, several kinds of heartworm of dogs, yellow fever, dengue, bird malaria, equine encephalitis and fowlpox.

The author has had much experience in the organization and operation of mosquito abatement enterprises and his chapter on this subject is a mine of information, revealing the varied ramifications of the ecologic adaptations of the larval and imago stages of mosquitoes and their interplay with human factors ranging from public utilities to duck clubs. Cockroaches, bedbugs, cone nose bugs, lice, gnats, horseflies, houseflies, blood-sucking muscids, fleas, ticks and mites all come in for an exposure of their direct and vector relations to human and animal disease. The black widow spider is illustrated and discussed, and other venomous and urticarial arthropods from bees to centipedes are described. The medical uses of arthropods have an unexpectedly wide range. They include not only use of the long known Spanish fly, the use of honey on wounds and the curious utilization of the mandibles of decapitated ants and beetles in suturing wounds, but the more recent application of malarial infections in the therapy of dementia paralytica and arthritis, the surgical use of maggots, the use of bee venom and xenodiagnosis.

This book is not only a valuable textbook for entomologists and parasitologists but also an important reference work for the physician, public health officer, sanitary engineer and veterinarian. The illustrations are excellent, and significant bibliographies are included in each chapter.

Investigations sur le glaucome (essais). Par le Dr. E. P. Fortin. Paper. Pp. 47, with 34 illustrations. Buenos Aires: "El Ateneo," [n. d.]

For the past ten years Fortin has published in the Argentine and Spanish journals articles having to do with the maintenance of intra-ocular pressure. He has been interested in glaucoma especially from an anatomic point of view. The present pamphlet includes many beautiful illustrations of the iris angle and its environs, together with theories as to the production of glaucoma. Fortin believes that aqueous is evacuated from the anterior chamber by the action of the ciliary muscle sliding forward on the sclera. When the lens bulges forward in accommodation, additional space is needed and the aqueous is drained as the canal of Schlemm becomes more patulous. The action of the muscle of the ciliary body is compared to the heart action on the blood stream. Flaccidity of this muscle may cause glaucoma. The enlarged pupil of glaucoma is due likewise to a flaccid muscle, as the pupillary and the ciliary musculature have the same innervation. The pectinate "ligament" is misnamed, as there is no cordlike structure but simply a meshwork of tissue. Miotics act to close the ciliary muscle toward the axis of the eye, and thus the fluid is reduced in pressure. Particles of pigment cannot be a prodrome of glaucoma, as they would ordinarily be filtered out through the pectinate "ligament." Fortin believes that it is necessary to use physostigmine in the eye before these particles can be recognized. Iridectomy fails to relieve glaucoma, even though the canal of Schlemm is opened, if the pectinate "ligament" is not destroyed. At present the views of Fortin have not been generally accepted. The contribution in French leaves much to be desired because of language difficulties. Its value remains to be seen, although the ideas are of much interest to physiologists and ophthalmologists.

Surgical Treatment of Hand and Forearm Infections. By A. C. J. Brickel, A.B., M.D., Departments of Anatomy and Surgery, Western Reserve University, Cleveland. Cloth. Price, \$7.50. Pp. 300, with 201 illustrations, including 35 plates. St. Louis: C. V. Mosby Company, 1939.

This clinical, anatomic and experimental treatise on the surgical treatment of infections of the hand and forearm is well done and clear. T. Wingate Todd endorses the anatomic accuracy of the anatomic portions and illustrations. The colored plates are excellent. Some of the anatomic illustrations are done in black and white with the opposing page in color. The photographs of infected hands do not tell the story as well as the excellent drawings do. Roentgenograms of the hand after injection of radiopaque material are included. The book furnishes a quick reference for the busy practitioner. Every general, industrial and orthopedic surgeon should be acquainted with its contents. It is only by means of anatomic knowledge, clinical research and experience that scientific treatment can be developed. Treatment is successful only as it is based on facts.

Worth's Squint or the Binocular Reflexes and the Treatment of Strabismus. Seventh edition by F. Bernard Chavasse, M.A., D.M., Surgeon, Eye Department, Liverpool Eye and Ear Infirmary, Liverpool. Cloth. Price, \$8. Pp. 688, with 225 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1930.

The present edition of this classic on squint differs greatly from all previous editions. As Chavasse comments in the preface, "The possibility of rewriting the book (previous editions) was very carefully considered. It then became clear that it was not possible—or even desirable—to rewrite a classic." Since the fundamental researches of Helmholtz, Hering, Tschermak, Javal and Worth, a new conception of the phylogeny, the ontogeny and the physiology of the muscles of the eye has been created by Sherrington, Magnus and Pavlov. Hence the author has added a subsidiary title to the book, and he transmits this point of view in his detailed consideration of such factors in squint as the anatomy and physiology of the foundations of binocular reactions, the anatomic and reflex development in the child and the pathology of binocular anomalies. The last includes an insight into the obstacles of reflexes, their sight and nature, heterophoria and dissociation by primary sensory obstacles, and dissociation by primary motor obstacles. The difficulties encountered in accommodational and refractive states in the production of squint are thoroughly discussed. Both functional and somatic reactions to dissociation, inhibitions and the effects of secondary correspondences are well illuminated by case reports. Section IV is devoted to the diagnosis of the deviation, the state of sensory correspondences and the cause of the squint. The section on treatment includes treatment of the cause, of the secondary sensory correspondences and of the deviation and, finally, the technic of certain operations. An appendix of illustrative cases completes the volume. These are selected to show the salient features of the various types of strabismus and include many cases observed during the past fifteen years at the Eye and Ear Infirmary of Liverpool, which was established in 1820. This edition encompasses far more than does anything else which has been written concerning squint. The illustrations are simple and clear. The print is large and well spaced. While authorities are mentioned by name, there is no bibliography. An index of seven pages is ample. Chavasse has indeed rewritten in a manner most commendable a classic that has withstood the test of thirty-five years. Its usefulness to those interested in the study of binocular vision and parallelism of the eyes is obvious.

Fundamental Principles of Bacteriology with Laboratory Exercises. By A. J. Sallie, B.S., M.S., Ph.D., Assistant Professor of Bacteriology, University of California, Berkeley. Cloth. Price, \$4. Pp. 679, with 215 illustrations. New York & London: McGraw-Hill Book Company, Inc., 1939.

This is an interesting attempt to teach general bacteriology to elementary students by a new approach. Most textbooks are written from a taxonomic point of view and consequently tend to overemphasize classification and morphologic and biochemical characteristics of bacteria. The author has successfully avoided this and has chosen a harder but more logical method to present principles that are not only of more interest to the general student but might even be expected to be retained by him for a reasonable time. It is not to be expected that critics will agree entirely with the material selected by the author. To appreciate many of the discussions, something more than elementary courses in inorganic and organic chemistry are required. The book is replete with complicated chemical formulas showing the end products of enzymic action, the structure of dyestuffs and the decomposition products of proteins, organic phosphorus compounds and others. While the reader is indebted to the author for gathering in one volume these complex formulas and the reactions which they represent, they would seem to belong in an advanced rather than in an elementary textbook. It is not necessary to describe in detail the subjects treated. They cover the entire range of bacterial activity and are presented in a readable and accurate manner, although with more detail in some instances than seems desirable. Laboratory exercises are included and these are rather better than usual. They are designed to teach principles rather than technic. It is refreshing to read a textbook which is an honest attempt to present material that most teachers know should be given to the elementary student but which is more difficult for the teacher than the more orthodox courses offered in our colleges.

A Text-Book of Pharmacognosy. By George Edward Trease, B.Pharm., Ph.C., A.I.C., Lecturer on Pharmacognosy in the University College of Nottingham, Nottingham. With Contributions by R. Blenfang, B.S., M.S., Ph.D., et al. Third edition. Cloth. Price, \$6. Pp. 739, with 243 illustrations. Baltimore: William Wood & Company, 1939.

This work has won recognition in all English speaking countries. The present edition has been thoroughly revised and enlarged. Some rearrangement of the order of presentation has been made, this order now being: part I, general principles, including historical introduction; part II, microscopy, including discussion of apparatus and reagents and a review of histologic features of pharmacognostic importance; part III, drugs of vegetable origin, with morphologic and botanic classifications; part IV, drugs of animal origin, and part V, physical and chemical methods of drug analyses. Included are ten maps showing the geographic source of drugs and a glossary of Latin words used in naming species. Pharmacognosy at present is definitely a subject for students of pharmacy and includes much that is of little interest to physicians. Medical students get little or no instruction in it. However, physicians who are interested will find this a satisfactory work and also interesting. Clarity of presentation is an important feature.

Royal Northern Operative Surgery. By the Surgical Staff of the Royal Northern Hospital. Cloth. Price, £2.2s. Pp. 551, with 463 illustrations. London: H. K. Lewis & Co., Ltd., 1939.

Printed on fine paper and containing excellent illustrations, this is a beautiful exposition of the surgical technic carried out by the members of the staff of an English hospital. The material is in a strictly anatomic arrangement and covers the entire body and its structures. The treatment of fractures is not included except that of the femoral neck. As a rule only one operation is cited for any given problem, and this represents the usually accepted technic for that hospital. As can be expected there is not much that is new or different in this book, although the methods described are usually modern. The authors have adopted the electrocoagulation method of cholecystectomy advocated by Thorek. The size and purpose of this volume obviate any attempt at comprehensiveness. Nevertheless it is a pleasant and refreshing book to peruse.

A Fundamental Approach to Bacteriology. By Courtland Sawin Mudge, Ph.D., Associate Professor of Dairy Industry, University of California, San Francisco, and Floyd Russell Smith, Ph.D., Instructor in Dairy Industry, University of California. Paper. Price, \$3. Pp. 265, with 17 illustrations. San Francisco: J. W. Stacey, Inc., 1939.

This is an approach to bacteriology primarily through the laboratory. The book is built around laboratory exercises and demonstrations with explanations and description intended to prepare the student for an understanding of the work he is about to perform. The laboratory work covers that usually presented in courses in general bacteriology, and the selection of exercises is excellent. The descriptive matter is presented in a conversational style not infrequently found in secondary school laboratory textbooks in the sciences. Although accurate and sufficient for the purpose of an elementary course in bacteriology, it is doubtful that this method will appeal to most college students. The authors make no claim that the book is more than a laboratory manual written in a somewhat unconventional manner and admit that it does not have the "dignity of the usual text." Both of these statements are true.

Hair-Dyes and Hair-Dyeing Chemistry and Technique. By H. Stanley Redgrove, B.Sc., F.I.C., F.R.H.S., and the late Gilbert A. Foan. A new edition completely revised by H. Stanley Redgrove and J. Barl-Woolfs. Cloth. Price, \$5. Pp. 205, with 33 illustrations. New York: Chemical Publishing Company, Inc., 1939.

This small book is invaluable to the hair dresser and brings much of value and interest to the layman and physician. The reader is first impressed by the great complexity of the subject. The number of dyestuffs, good and bad, harmful and less harmful, their innumerable combinations and the careful technic that must be followed in their successful use explain clearly why the practicing physician, who is only an amateur at best in his knowledge of hair dyeing, cannot give adequate advice on how to do it. He can only tell the prospective dyer to consult the best available hair dresser and to insist on a preliminary patch test, for "para," the hair dressers' name for paraphenylenediamine, is almost sure to be an ingredient of every effective hair dye.

On page 144 directions are given for the patch test, called the Sabouraud-Rousseau test. The use of eau de cologne as

one of the cleansing agents preliminary to the patch test can be criticized as introducing other allergens, which may confuse the interpretation of the result. Criticism can also be made of this statement, on page 111: "It is interesting and important to note that in the case of a person idiosyncratic towards an 'eczematogenous substance' the abnormal skin reaction seems to be independent of the concentration of the substance, in which respect the reaction is totally different from that of poisoning." The fact is that concentration has a great deal to do with allergic reactions. Considering the professions of the authors, however, one must agree that there are remarkably few opportunities for criticism even when they discuss subjects as difficult as allergy.

Treating of the danger of dermatitis from hair dyes, the authors are frank in acknowledging the facts and in warning of the danger. Particularly in respect to the exceedingly dangerous practice of using dyes containing "para" for the coloring of eyebrows and lashes do they give emphatic warning. While strongly advising against the attempt, they give minute directions for minimizing the danger if it is undertaken. British hair dressers are still playing with this fire.

The book is well written, thorough and easy to understand. It treats of the structure of the hair, bleaches, dyes of various kinds and degrees of excellence, "brightening shampoos" and "rinses" and the technics of the various procedures and ends with a chapter on the causes of gray hair, with some hints to those who wish to avoid premature grayness.

Infections of the Hand: A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand and Forearm. By Allen B. Kanavel, M.D., Sc.D. Seventh edition. Cloth. Price, \$6. Pp. 503, with 229 illustrations. Philadelphia: Lea & Febiger, 1939.

Dr. Kanavel, whose tragic death on May 27, 1938, was a great shock to the medical world, has left for posterity and humanity a monumental work on infections of the hand, revised and brought down to date a short time before his death. There are four parts to the volume. The first is concerned with the anatomy of the hand with reference to infection, the second with localized infections and clinical entities, the third with lymphangitis, fascial space and tendon sheath infections, and the fourth with complications, sequelae and after-treatment of infections of the hand. Special emphasis is placed on the prevention of deformities and on treatment with function always in mind. The treatment of sequelae of infections has been stressed more in this than in preceding editions. The volume is generously supplied with reproductions of roentgenograms and photographs, diagrams and anatomic illustrations.

A Textbook of Surgery. By American Authors. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Associate Professor of Surgery at Northwestern University Medical School, Chicago. Second edition. Cloth. Price, \$10. Pp. 1,695, with 1,381 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

An imposing array of surgeons has been mustered to compile a textbook of surgery of exceptional value and authority. The constant state of flux permeating the field of surgical knowledge has created in its wake a host of specialists in a field already highly technical. These specialists have combined their efforts to produce in almost seventeen hundred full pages a standard textbook on surgery to be written. The material content expresses the opinion of each author and, while differences exist, it is impossible for a reviewer to draw conclusions on the individual contributions. He must either concur or differ with the mode of presentation, a duty which is rightfully relinquished to the discriminating reader. The comprehensive scope of this single volume makes it a genuine epitome of modern surgery. General surgery and the specialties alike are subdivided and receive exposition from a varying number of physicians. The brief bibliographic lists following many of the chapters contain recent references and further enhance the study of any topic. There are numerous illustrations of variable value. The reproduction of the roentgenograms in general is not wholly satisfactory. The great advantage in a book of this sort is the thoroughness with which it can undergo revision. A new edition, therefore, will usually contain much new material and little floating dead wood. While too advanced for the average student, this book will serve well the postgraduate student of surgery and the practicing physician, surgeon or internist.

Clinical Biochemistry. By Abraham Cantarow, M.D., Associate Professor of Medicine, Jefferson Medical College, Philadelphia, and Max Trumper, Ph.D., Clinical Chemist and Toxicologist. With a foreword by Hobart A. Refaiani, M.D., Professor of Medicine, Jefferson Medical College. Second edition. Cloth. Price, \$6. Pp. 666, with 15 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

The task of adequately discussing the many biochemical subjects which find important applications in clinical medicine and surgery in a comparatively short textbook is admittedly difficult. Under the new title "Clinical Biochemistry" the authors have extensively revised and supplemented the material presented in the first edition. Chapters or sections are devoted to the metabolism of carbohydrates, proteins, lipids, chloride, calcium, inorganic phosphorus, magnesium, iron, iodine, sodium and potassium and to the topics of phosphatase activity, acid-base balance, respiratory exchange and basal metabolism, vitamins, renal function, hepatic, gastric and pancreatic function, cerebrospinal fluid and water balance. The normal picture is presented and the abnormal conditions bringing about disturbances are emphasized. Attention is given principally to changes of the blood constituents in the various disease conditions. The summary chapter on the most important chemical changes which may be utilized in diagnosis and prognosis of various diseases or conditions should be helpful. Although criticism might be found for inadequacy of material and citation of the literature in certain sections, the text, on the whole, should prove of considerable value to the practicing physician who wants a review of the various topics to be better able to select biochemical determinations to aid in diagnosis and prognosis. More attention, however, could have been given with advantage to the choice of biochemical methods to be employed.

Petite chirurgie et technique médicale courante. Par G. Roux, professeur agrégé à la Faculté de médecine de Montpellier. Cloth. Price, 120 francs. Pp. 591, with 361 illustrations. Paris: Masson & Cie, 1938.

The objective of this book is the presentation of the principles of minor surgery and medical technic to advanced students, interns and young assistants. The author set out to embrace not only such subjects as preoperative and postoperative care, emergency treatment of fractures, blood transfusions, minor surgical procedures and the customary methods of clinical investigation, e. g. determinations of the blood pressure, gastric lavage and parenteral administration of drugs, but also heliotherapy, hydrotherapy and minor otorhinolaryngologic, ophthalmologic, urologic and gynecologic interventions. The material is divided into short sections and paragraphs, each with subheadings that indicate its contents. A fastidious, lengthy description of such vast material was purposely omitted in an attempt to present a concise but comprehensive guide to bedside diagnosis and treatment. Many methods, instruments and apparatus described in the book and named after French authors are known to the American student under different names, and in view of the variance in the terminology this manual would be of little value to him. The author seems to have taken too big a bite and as a result many subjects are treated in an inadequate manner. To be brief but complete, a synopsis must necessarily limit itself to a relatively narrow field. An attempt to familiarize the young assistant with the popular methods of diagnosis and with therapeutic technic in all branches of medicine must result in a superficial, incomplete and therefore less valuable presentation.

The Patient is the Unit of Practice. By Dnane Willard Propst, A.B., B.S., M.D., Assistant Professor of Medicine, University of Illinois College of Medicine, Chicago. Cloth. Price, \$3.50. Pp. 219, with 9 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

The author of this book tries to systematize medicine so that it can be utilized by the student in a chartlike fashion. He discusses at length the constitutional potentialities of disease and the psychogenic factors concerned in the patient's attitude toward his problem. A great deal of space is taken up by the psychosomatic approach. In his "diagnostic or working hypothesis" he reports a case of numerous functional complaints associated with delusions and illusions. However, even after meticulous observations no examination of the spinal fluid is reported and no diagnosis is made as to the mental aspect of the patient. He goes at length into the various diagnostic procedures, which, of course, are exceedingly elementary. The

charts are not at all inclusive. For instance, the chart on the etiology of dyspnea is so confusing that it emphasizes the necessity for the student to have a photographic mind. The therapeutic principles outlined are divided into rest, diet, symptomatic treatment and psychotherapy. He emphasizes at great length the relation of weather conditions to disease. He is particularly interested in the biosocial classification of mankind. All in all the book is a philosophic approach to the problems of medicine from the point of view of both diagnosis and treatment. This probably represents a hobby of the author and should not be taken too seriously as the best method of teaching medical students the importance of medical facts; nor does it arouse the curiosity of the student toward an investigative approach.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Liability of Charitable Hospital for Injury to Pay Patients.—A hospital conducted in the interest of charity, the Supreme Court of Idaho held in *Wilcox v. Idaho Falls Latter Day Saints Hospital*, is not liable to pay patients injured through the negligence of hospital employees, even though the hospital may not have exercised due care in the selection of the negligent employee. The court based its holding on the ground that one who accepts the benefit of a charity enters into a relation which exempts the benefactor from liability for the negligence of his servants in administering the charity. The articles of incorporation of a hospital, the court said, are admissible in evidence to establish a disputable presumption as to the charitable status of the hospital. In this case a child was taken to the hospital for treatment for pneumonia. Her attending physician directed that she be given diathermy treatment. The treatments were administered by a hospital nurse during the course of which the child sustained a severe burn.

In *Sisters of the Sorrowful Mother v. Zeidler*, the Supreme Court of Oklahoma held that a pay patient in a charitable hospital may recover damages for injuries sustained through the negligence of a servant, agent or employee of the hospital. The doctrine of nonliability, the court said, was "repugnant and shocking to a sense of fairness and justice to the victim of what may aptly be termed protected negligence." In this case, a woman was taken to the hospital in a delirious condition. Due, it was alleged, to the negligence of hospital employees in leaving her unattended, she fell or jumped from a second story window, death resulting.—*Wilcox v. Idaho Falls Latter Day Saints Hospital (Idaho)*, 82 P. (2d) 849; *Sisters of the Sorrowful Mother v. Zeidler (Okla.)*, 82 P. (2d) 996.

Health Insurance: Impacted Wisdom Teeth Not a Disease.—The defendant insurance company issued, Sept. 4, 1936, a policy insuring the plaintiff against "loss from disease contracted during the life of this policy and after it has been maintained in continuous force for thirty (30) days from its date." Within thirty days thereafter the plaintiff's dentist informed her that she had four impacted wisdom teeth. She had suffered no pain or illness from them and was not aware of the condition. On October 5 the impacted teeth were extracted and the plaintiff was unable to do any work for the succeeding five weeks. She brought suit on the policy. The trial court overruled motions of the insurance company for a judgment of nonsuit and entered a judgment in favor of the plaintiff, and the insurance company appealed to the Supreme Court of North Carolina.

The sole question before the court was whether or not the disability of the plaintiff resulted from a disease. The term "disease," said the court, has been defined as "an alteration in the state of the human body . . . or of some of its organs or parts interrupting or disturbing the performance of the vital functions, or of a particular instance or case of this"; as "deviation from the healthy or normal condition of any of

the functions or tissues of the body," and as "a morbid condition of the body." Black's Law Dictionary, ed. 3, 18 C. J. 1139. Obviously, then, the impacted teeth did not constitute a disease. The plaintiff did not know of the condition until so informed by her dentist; the teeth had given no trouble or pain; there was no disturbance in the performance of any of the functions or tissues of the body and no morbid condition existed. The sickness and disability following the extraction of the teeth were the results of the extractions to which the plaintiff voluntarily submitted; she might never have had any trouble, pain or sickness from the teeth if they had not been removed. Even if it is conceded that the impacted teeth constituted a disease, the evidence was clear, the court said, that the condition had existed for a long time prior to the lapse of thirty days following the issuance of the policy.

The trial court should have sustained the motion of the insurance company for a judgment of nonsuit. The judgment for the plaintiff was therefore reversed.—*McGregor v. General Acc. Fire & Life Assur. Corporation (N. C.)*, 198 S. E. 641.

Workmen's Compensation Acts: Cancer of Tongue Due to Inhalation of Sulfuric Acid Spray an Occupational Disease.—Boal, the plaintiff, had been employed for more than ten years as a "pickler" in one of the pickling rooms in the defendant company's storage battery plant. In the process of pickling used by the defendant, lead plates or "grids" for storage batteries were arranged on wooden racks inside of large tanks into which was piped a solution of sulfuric acid and water. After the tank was drained, the picklers removed the lead plates while still damp and placed them on trucks. The wooden racks were also removed and piled in the same room. Both the plates and the racks were allowed to dry in the pickling rooms. As a result of this operation, Boal and the other picklers were constantly exposed to and had to inhale a mist, a spray or the fumes of sulfuric acid, which commonly caused coughing, dryness of the mouth and smarting of the skin. A cancer developed on the right side of Boal's tongue. He brought suit at common law in the United States district court, E. D., Pennsylvania, against his employer, claiming that his cancer had been caused by the inhalation of the mist, spray or fumes of sulfuric acid. He alleged that the defendant company had negligently failed to warn him of the danger incident to his employment and to provide ventilating facilities or other devices for his safety. From a judgment of nonsuit, Boal appealed to the United States circuit court of appeals, third circuit.

Uncontradicted testimony showed that Boal's cancerous condition was so serious that death would result in a relatively short time. Expert witnesses testified that the inhalation of or exposure to the spray of sulfuric acid was the proximate cause of Boal's cancer. A pathologist testified that exposure to a mist of sulfuric acid would cause dehydration and disturbance of function of the cells of the mouth. A specialist in industrial toxicology, a chemist, testified that exposure of the cells of the mouth to a spray of sulfuric acid would cause physical damage to them and that the continued irritation or chemical trauma would eventually give rise to ulceration. Two physicians testified that such prolonged chemical irritation of the mucous membranes of Boal's mouth caused an ulcer to develop and in turn caused the unhealed ulcer to develop into cancer.

The defendant contended that its failure to provide ventilating facilities did not constitute actionable negligence, because the precautionary measures taken by it for the safety of its employees came up to the general standards prevailing in the industry. With this contention the circuit court of appeals was not in accord. The specialist in industrial toxicology testified that the defendant's practice of allowing the lead plates and the wooden racks to dry in the pickling rooms was "really the vice or error in the case, or in this working condition," and that in no pickling process in any industry was such procedure considered to be good practice. In fact, as he testified, a common procedure in the pickling of metal is to transfer the metal directly from the pickling vat to a conveyor which carries the metal away automatically, an exhaust or warm air system being used to prevent any mist of sulfuric acid getting into the air.

Neither could the court agree with the defendant's contention that it was not negligent in failing to warn the plaintiff of danger

because such danger was not known to it. The evidence showed that the defendant could have known of the danger if it had exercised due and proper diligence. General scientific knowledge existed on this subject which the defendant could have ascertained from various publications and from persons acquainted with the art, if proper inquiry had been made. One of the medical witnesses testified that "sulfuric acid is notorious for causing a type of ulcer which is indurating and doesn't tend to heal," and that "even in very low concentrations there would be definite damage done to the person breathing these fumes." Nor could the court agree with the defendant's further claim that it did not and could not know that cancer would develop from exposure to sulfuric acid fumes. The fact, as the defendant pointed out, that there was no record of and none of the expert witnesses could recall any other case in which the inhalation of fumes of sulfuric acid resulted in cancer was not conclusive, for the effect of such fumes on different persons would vary according to individual physical resistance. Where an employer knows or is presumed to know that a danger exists, it is not necessary that he should have contemplated the particular consequences, the form of the accident or the nature of the injury, and the fact that an accident is unusual, extraordinary or even unheard of does not relieve the employer of liability.

In the judgment of the court, the plaintiff was not precluded by the Pennsylvania workmen's compensation act from maintaining this common law action in tort. Under that act, diseases caused or aggravated by accident are compensable, but diseases of gradual development, or occupational diseases, are not compensable. The court disagreed with the defendant's claim that because cancer is not a disease known by common experience to result from the occupation of pickling metal, Boal was not suffering from an occupational disease. Occupational diseases are not limited to those diseases which are known by common experience to have resulted from a certain occupation.

Accordingly, the circuit court of appeals reversed the judgment of nonsuit and ordered a new trial.—*Boal v. Electric Storage Battery Co.*, 98 F. (2d) 815.

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Oto-Laryngology, Chicago, Oct. 8-13. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.
- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American Clinical and Climatological Association, Saranac Lake, N. Y., Oct. 9-11. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.
- American College of Surgeons, Philadelphia, Oct. 16-20. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
- American Public Health Association, Pittsburgh, Oct. 17-20. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.
- American Society of Anesthetists, New York, Oct. 12. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Association of American Medical Colleges, Cincinnati, Oct. 23-25. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
- Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.
- Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
- Clinical Orthopaedic Society, Little Rock, Ark., and Oklahoma City, Oct. 13-14. Dr. H. Earle Conwell, 215 Medical Arts Bldg., Birmingham, Ala., Secretary.
- Delaware Medical Society, Nov. 11. Dr. John H. Mullin, 601 Delaware Ave., Secretary.
- Gulf Coast Clinical Society, Nov. 27. Dr. Clyde C. Rouse, 56 St. Joseph St., Secretary.
- Indiana State Medical Association, Fort Wayne, Oct. 10-12. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.
- International Society of Medical Health Officers, Pittsburgh, October 16. Dr. Leon Banov, 12 Mill Street, Charleston, S. C., Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
- National Society for the Prevention of Blindness, New York, Oct. 26-28. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.
- New York State Association of Public Health Laboratories, Albany, Nov. 3. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 37-68 (Aug.) 1939

- Mediastinal Tumors in Children: Report of Case. D. B. Monsky, Montgomery.—p. 37.
Hyperinsulinism Cured by Removal of an Islet Cell Adenoma: Report of Case. J. E. Beck and G. O. Segrest, Mobile.—p. 40.
Syphilis in Private Practice: Case Reports Illustrating Problems in Management. C. K. Weil and W. H. Y. Smith, Montgomery.—p. 43.
Id.: Differential Diagnosis of Venereal Diseases. C. R. Lafferty, Montgomery.—p. 50.
Chronic Back Pain. P. W. Shannon, Birmingham.—p. 53.

American Journal of Medical Sciences, Philadelphia

198: 149-300 (Aug.) 1939. Partial Index

- Central Connections of Vestibular Pathways: Experimental Study. W. E. Dandy and P. A. Kunkel, Baltimore.—p. 149.
*Value of Colloidal Aluminum Hydroxide in Treatment of Peptic Ulcer: Review of 407 Consecutive Cases. E. E. Woldman and C. G. Polan, Cleveland.—p. 155.
Prolongation by Zinc Salts of Water Balance Reaction of Posterior Hypophyseal Extract. E. M. Boyd and K. J. Clark, Kingston, Ont.—p. 171.
Choice of Technic for Sedimentation Test. A. Hambleton and R. A. Christianson, London, Ont.—p. 177.
Note on Erythroblastic Splenomegaly Occurring During Pregnancy. R. A. Moore and J. B. Pastore, New York.—p. 187.
Sedimentation Rates of Sickled and Nonsickled Cells from Patients with Sick Cell Anemia. H. Bunting, Baltimore.—p. 191.
Experimental Production of Vitamin B₁ Deficiency in Normal Subjects: Dependence of Urinary Excretion of Thiamin on Dietary Intake of Vitamin B₁. N. Jolliffe, R. Goodhart, J. Gennis and J. K. Cline, New York.—p. 198.
*Evaluation of Influence of Overweight on Blood Pressures of Healthy Men: Study of 3,516 Individuals Applying for Periodic Health Examination. J. J. Short and H. J. Johnson, New York.—p. 220.
Further Studies on Treatment of Chorea and Rheumatic Infection by Fever Induction. E. L. Bauer, Philadelphia.—p. 224.
Note on Oral Administration of Potassium Chloride in Treatment of Hay Fever, Nasal Allergy, Asthma and Sinusitis. A. F. Abt, Chicago.—p. 229.
Lymphogranuloma Venereum: Treatment of 300 Cases, with Special Reference to Use of Frei Antigen Intravenously. B. A. Kornblith, New York.—p. 231.
Prognosis in Diabetic Coma: Basic Importance of Mental State. L. B. Owens and S. S. Rockwern, Cincinnati.—p. 252.

Colloidal Aluminum Hydroxide for Peptic Ulcer.—Woldman and Polan have now employed the continuous administration of colloidal aluminum hydroxide for three years in the treatment of 407 patients with peptic ulcers. The treatment represents no radical departure from the methods that have been in use for many years, all of which have been designed to counteract the effects of excessive acid secretion in the stomach. The drip treatment with colloidal aluminum hydroxide merely emphasizes and expands this principle by the use of a more effective neutralizing agent administered continuously instead of intermittently. The corrosive action of hydrochloric acid is the most formidable antagonist to the healing process. If the factors causing the ulcer are dominant over the natural healing process, the lesion progresses steadily. On the other hand, if the factors producing the ulcer are satisfactorily controlled, then the balance shifts in favor of healing. It follows that treatment, to be satisfactory, should protect the ulcer from acid corrosion continuously. Otherwise the accumulation of acid at night may destroy some of the granulation tissue formed during the day and thus delay or prevent healing. In addition to its exceptional neutralizing effect, colloidal aluminum hydroxide appears to promote healing by coating the lesion with a jelly-like, protective mass, and by its astringent effect. The most striking features of this treatment are prompt relief of pain, rapid healing of the ulcer, healing of refractory ulcers unsuccessfully treated by other methods and excellent results in bleeding ulcer.

Of 101 patients with massive hemorrhage treated, only three died. The authors do not claim that this regimen can prevent the recurrence of ulcers after they have been healed. Nevertheless, thirty patients who have continued to take colloidal aluminum hydroxide by mouth for two years or more have been followed closely throughout the entire period, and none of them have had a recurrence, although previously a number of them had had exacerbations of ulcer symptoms two or three times annually for several years. Laboratory studies made on these patients showed that the drug had no harmful effect.

Influence of Overweight on Blood Pressures.—In evaluating the effect of overweight on blood pressure, Short and Johnson determined the systolic and diastolic pressures of 2,858 overweight and, for comparison, 658 normal weight men, all in supposedly good health. The authors also consider the effect of both the degree and the duration of obesity on hypertension and state that it is unfortunate that these contributory factors have usually been ignored in previous studies on the subject. All the men were ambulatory, about their usual occupations. They applied for the periodic health examination provided by insurance companies carrying their several policies. They have been unselected for the study except for the factor of overweight. Those having a systolic pressure of 150 mm. or higher were considered as having systolic hypertension and those having a diastolic pressure of 90 mm. or higher as having diastolic hypertension. The subjects were divided into weight groups as follows: a "normal" weight group whose weights ranged from 5 per cent under to 5 per cent over "ideal" weight, and overweight groups of from 6 to 15, 16 to 25, 26 to 40 and 41 or more per cent above "ideal" weight. For systolic blood pressure there was virtually no increased incidence among those of normal weight. There was, however, a moderately increased incidence for each overweight group up to 40 per cent, at which point the incidence of hypertension was 10 per cent, while in the group more than 40 per cent overweight there was a sharply increased incidence of hypertension to more than 30 per cent. The incidence of diastolic hypertension exceeded that of systolic hypertension in all ranges of overweight and, in general, showed a progressive increase to more than 35 per cent in the highest weight group. The difference in average blood pressures was greatest in the age group from 50 to 59 years. The incidence of hypertension in the overweight group was generally lower than reported by other observers. Average blood pressures were consistently higher in the overweight group, but not so great as had been expected. The authors are inclined to agree with Mosenthal that the influence of overweight on blood pressure has probably been somewhat exaggerated.

American Journal of Physiology, Baltimore

127: 1-210 (Aug.) 1939. Partial Index

- Studies on Estimation of Cardiac Output in Man, and of Abnormalities in Cardiac Function, from the Heart's Recoil and the Blood's Impacts; the Ballistocardiogram. I. Starr, A. J. Rawson, H. A. Schroeder and N. R. Joseph, Philadelphia.—p. 1.
*Alterations in Dark Adaptation Under Reduced Oxygen Tensions. R. A. McFarland and J. N. Evans, Brooklyn.—p. 37.
Leukocytosis Following Parenteral Administration of Liver Extract in Man. H. D. Bruner, Charleston, S. C.—p. 58.
Respiratory and Vasomotor Effects of Variations in Carotid Body Temperature: Study of Mechanism of Chemoreceptor Stimulation. T. Bernthal and W. F. Weeks, Ann Arbor, Mich.—p. 94.
Measurement of Blood Flow of Spleen. J. H. Grindlay, J. F. Herrick and F. C. Mann, Rochester, Minn.—p. 106.
Rhythmicity of Spleen in Relation to Blood Flow. J. H. Grindlay, J. F. Herrick and E. J. Baldes, Rochester, Minn.—p. 119.
Conduction Velocity and Diameter of Nerve Fibers. J. B. Hursh, New York.—p. 131.
Properties of Growing Nerve Fibers. J. B. Hursh, New York.—p. 140.
Magnitude, Adequacy and Source of Collateral Blood Flow and Pressure in Chronically Occluded Coronary Arteries. D. E. Gregg, J. J. Thornton and F. R. Mautz, Cleveland.—p. 161.
Action of Progesterone on Gonadotropic Activity of Pituitary. E. B. Astwood and H. L. Fevold, Cambridge, Mass.—p. 192.

Dark Adaptation Under Reduced Oxygen Tensions.—McFarland and Evans measured the phenomena of the darkening of the visual field under anoxia by the usual procedures used in studying night blindness. Each of the twenty subjects (students and physicians) went through a practice period of two hours, during which time the dark adaptation test was given repeatedly. This was sufficient so that each subject's report was consistent. The dark adaptation curves (plotting threshold against time) were progressively elevated with

increasing oxygen deprivation. These effects were counteracted within two to three minutes by inhaling oxygen. The diminution in light sensitivity was statistically significant for all but five of the eighteen subjects at the first simulated altitude of 7,400 feet, for all but one at 11,000 feet and for the entire group at 15,000 feet. The magnitude of these changes was 0.1, 0.22 and 0.4 of a log unit, respectively. These effects are probably of no great practical significance in relation to night blindness in a pilot until altitudes of approximately from 10,000 to 12,000 feet are attained. In the authors' opinion the results obtained in this experiment suggest that the changes are not concerned with the photochemical substances of the retina but with the neural elements of both the retina and the central nervous system.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 161-320 (Aug.) 1939. Partial Index

- Diseases of Hypopharyngeal Region Producing Dysphagia: Roentgenologic Consideration. E. H. Shannon and A. H. Veitch, Toronto.—p. 173.
- *Multiple Giant Bullae Associated with Anthracosilicosis: Clinicopathologic Study of Case. E. R. Wiese, C. A. Heiken and R. Charr, White Haven, Pa.—p. 186.
- Hemangioma of Vertebra with Compression Myelopathy. N. S. Schlesinger, Philadelphia, and H. Ungar, Jerusalem, Palestine.—p. 192.
- Intervertebral Disk: Involvement in Vertebral Fractures and in Spinal Pathology: Report of Fifty-Six Cases. H. A. Olin, Chicago.—p. 235.
- Ainhum: Its Occurrence in the United States: Report of Three Cases. E. W. Spinzig, St. Louis.—p. 246.
- Cardiac Mensuration Aided by Horizontal Orthodiagraphy. W. R. Stecher, Easton, Pa.—p. 264.
- Roentgen Diagnosis of Meckel's Diverticulum. B. Ehrenpreis, Brooklyn.—p. 280.
- *Roentgen Therapy in Acute and Chronic Otitis Media. J. P. Brown, L. L. Titcher and W. E. Lawson, Monroe, La.—p. 285.

Giant Bullae and Anthracosilicosis.—A case of multiple giant bullae of the lung associated with anthracosilicosis, proved clinically and roentgenologically and substantiated by gross post-mortem observations and microscopic examination, is reported by Wiese and his associates. They believe this case to be unique because of the multiplicity and the size of the bullae, which could readily have been mistaken for spontaneous pneumothorax.

Roentgen Therapy for Otitis Media.—Brown and his co-workers state that the roentgen treatment of acute and chronic otitis media is rational because of all the body cells the lymphocytes are the most sensitive to the rays. Lymphocytic infiltration is a major and constant feature of inflammation and infection of the middle ear, and breaking down these cells relieves pressure within the cavity and thereby relieves pain. Roentgen irradiation also promotes phagocytosis, which progresses rapidly until the lymphocytes are almost entirely destroyed. The polymorphonuclears and eosinophils undergo disintegration somewhat less rapidly. In addition to this cellular destruction and phagocytosis, the x-rays are believed to liberate enzymes, antibodies and other unknown principles which also aid in the processes of autolysis and liquefaction. The technic that the authors employed has varied. At present they are using 85 kilovolts (peak), 5 milliamperes, 16 inch target-skin distance and 1 mm. of aluminum filter. They do not follow a hard and fast rule as far as dosage is concerned but take into consideration the severity or duration of the condition and the age of the patient. In mild cases in infants they have used from 50 to 60 roentgens and in young children and adults the dosage has varied from 60 to 100 roentgens. Their cases of acute catarrhal otitis media required only one treatment. In cases of acute purulent otitis from three to seven days elapsed between treatments, depending on the condition of the ear. Patients with chronic purulent otitis received treatments about ten days apart. In acute otitis media if the temperature was not more than 99.6 F., with bulging of the drum and obliteration of the short process, irradiation was not preceded by myringotomy. Only one of thirty-one cases of acute catarrhal otitis media required myringotomy following therapy and in this instance myringotomy had been refused by the parents and roentgen therapy was tried as the only resort. The majority of the cases were seen within the first twenty-four or forty-eight hours. The average number of roentgens was 72.9 and the number of days required for the drum to return to normal was 3.15. Of eighteen cases of acute purulent otitis media, myringotomy was performed in twelve, while spontaneous rupture of the drum

membrane occurred in the other six within twenty-four hours of being seen. The duration of symptoms before the first examination varied from three days to six hours. These patients received an average of 1.33 treatments, with an average of 70 roentgens. The ears were dry and the drums were normal within an average of 8.16 days. Four patients required two treatments and one patient three treatments. None of the eight cases of chronic purulent otitis media, with a history of an intermittent discharging ear of from four months to eight years, required myringotomy, the opening in the drum being of sufficient size to afford excellent drainage. Six patients received only one treatment, one received two treatments and one received three treatments. An average of 64.54 roentgens was given. The ears were dry within an average of 11.63 days. In nine of eleven cases not classified an initial roentgen treatment was given and the patient did not return for further observation, one was finally cured and one was afforded considerable relief. In conclusion the authors state that instead of mastoidectomy it now seems that not only will a short series of roentgen treatments suffice to cause an ear to become dry and free from pain, but hearing will be fairly normal in it. None of their cases have shown any complication following this mode of therapy.

Archives of Neurology and Psychiatry, Chicago

42: 373-594 (Sept.) 1939

- Partial Thénar Atrophy: Clinical Entity. R. Wartenberg, San Francisco.—p. 373.
- Experimental Study of Pathogenesis of Cerebral Changes Following Prolonged Insulin Hypoglycemia. H. Yarnet, with technical assistance of J. F. Iannucci, New Haven, Conn.—p. 395.
- *Recovery of Sympathetic Nerve Function in Skin Transplants. F. E. Kredel, Charleston, S. C., and D. B. Phemister, Chicago.—p. 401.
- Palatal Myoclonus. O. Sittig and V. Haskovec, Prague, Czechoslovakia.—p. 413.
- Effect of Pleasant and of Unpleasant Ideas on Respiration in Psychoneurotic Patients. J. E. Finesinger, Boston.—p. 425.
- *Protective Effect of Cholesterol in Experimental Epilepsy. R. B. Aird and C. Gurehot, San Francisco.—p. 491.
- Unusual Form of Lymphocytic Chloromeningitis. J. E. Skogland and A. B. Baker, Minneapolis.—p. 507.
- Convulsive and Other Neurologic Phenomena Appearing in Senile and Arteriosclerotic Psychoses. J. B. Tompkins, Boston.—p. 513.
- Objective Technics in Personality Testing. G. C. Booth, New York.—p. 514.

Recovery of Nerve Function in Skin Transplants.—Kredel and Phemister followed up for periods up to nine years eleven patients with skin transplants, chiefly pedicle flaps, for evidence of sympathetic recovery. Sudomotor, vasomotor, pilomotor and sebomotor functions were studied and correlated with the recovery of sensation. The study shows that a considerable amount of sympathetic nerve function may return to transplanted pedicle skin flaps. Variability in the rate and extent of recovery is marked. Adequate return of associated sensation, particularly of light touch, seems a necessary factor in sympathetic recovery. In case 1, in which there was considerable delay in return of light touch distally, sweating was not recovered in the lower portion of the skin transplant on the lower part of the right leg. In case 8, in which there was no recovery of touch, there was no sweating twenty-two months after the transplantation of a skin flap from the abdomen to the left forearm. In case 7 delayed and incomplete recovery of touch and of sympathetic functions was shown in the lower portion of the skin flap on the heel. In the tubed pedicle transplanted from the back to the undersurface of the chin in case 4 sweating was recovered only over the basal area of recovery of touch. The presence of deep scarring about a flap limits sympathetic as well as somatic nerve regeneration to all or to parts of a flap. Return of sudomotor and sebomotor function may be of some practical importance in keeping a flap clean. Three patients had some annoyance in this regard. However, infection was not observed to result from accumulation of dirt. Inadequate vasomotor function results in variations in color of the skin, which are undesirable from a cosmetic standpoint. Some of these vasomotor disturbances may persist if abnormal regeneration of sympathetic nerves to blood vessels has occurred. Some flaps remain hypersensitive to cold. The failure of thin free grafts to recover skin secretions is explained by the fact that many of the sweat and sebaceous glands are left behind, as well as by inadequate nerve regeneration due to fibrosis of the bed. Apparently, the small amount of duct epithelium

included in thin grafts prevents regeneration of functional secreting glands in Thiersch grafts. To what extent sweating may be recovered in the thicker types of free grafts deserves further study. Some return of sweating has been observed several years after lumbar and cervicothoracic sympathectomy for Raynaud's disease.

Cholesterol in Epilepsy.—Aird and Gurchot studied the effect of intravenous and parenteral injections of cholesterol on the convulsive threshold of white mice in which experimental epilepsy was induced by convulsive doses of cocaine hydrochloride. In conclusion they state that direct parenteral injection of cholesterol resulted in a marked rise in the threshold for convulsive doses of the cocaine. Both a colloidal suspension of cholesterol in water and a solution of cholesterol in olive oil showed this protective effect. After a series of protective injections of cholesterol, the convulsive effects of cocaine hydrochloride were more delayed in onset than the corresponding effects in control groups. This was interpreted as indicating delayed absorption of the convulsive agent. The protective effect likewise was explained on this basis. The results of the study were interpreted as consistent with the theory that the vital lipids play a significant part in the permeability of cell membranes and through this mechanism are an important factor in epilepsy.

Archives of Surgery, Chicago

39: 323-512 (Sept.) 1939

- Osteochondritis Dissecans of Head of Femur: Partial Idiopathic Aseptic Necrosis of Femoral Head. E. Freund, Los Angeles.—p. 323.
*Partial Thoracoplasty Without Deformation. M. Iselin, Paris, France, and C. R. Arp, Atlanta, Ga.—p. 353.
*Appendicitis, with Especial Reference to Pathogenesis, Bacteriology and Healing. W. F. Bowers, Omaha.—p. 362.
Primary Isolated Lymphogranulomatosis (Hodgkin's Disease) of Stomach: Report of Case. C. H. Avent, Memphis, Tenn.—p. 423.
Circulation During Spinal Anesthesia. W. Goldfarb, B. Provisor and H. Koster, Brooklyn.—p. 429.
Thyrototoxicosis with Malignant Neoplasms of Thyroid Gland: Clinicopathologic Study. H. A. Davis, Memphis, Tenn.—p. 435.
Embryology of Hip Joint: Preliminary Observations. D. A. De Santo, New York, and P. C. Colonna, Oklahoma City.—p. 448.
Tender Points in Diseases of Renal Pelvis and of Ureter: Peripheral Distribution of Unilateral and Bilateral Hyperalgesia and Anatomic Relations of Spinal Nerves and Muscles Involved. M. S. Levitas, Brooklyn.—p. 457.
*Morbidity Caused by Operative Complications. W. C. Beck, Chicago.—p. 478.
Sixty-Ninth Report of Progress in Orthopedic Surgery. J. G. Kuhns, S. M. Roberts, R. J. Joplin, W. A. Elliston, G. Bailey, Boston; J. A. Freiberg, Cincinnati; J. E. Milgram, New York, and F. E. Ilfeld, Los Angeles.—p. 489.

Partial Thoracoplasty Without Deformation.—Iselin and Arp state that the deformity resulting from a routine thoracoplasty is due to three causes: (1) vertical lowering of the scapula with subsequent fall of the shoulder, (2) sinking of the scapula into the depth and its lateral projection and (3) scoliosis, with convexity toward the side on which operation was done. It is their opinion that from the orthopedic point of view the removal of the transverse processes of the vertebrae is a mistake and conclude that, to cause no deformity, thoracoplasty should not involve the trapezius muscle, the angular and rhomboid muscles or the latissimus dorsi muscle, since these muscles fix the scapula. By modifying the direction of Picot's incision and cutting some of the trapezius fibers (the ascending fibers which play no part in fixation of the shoulder) they were able to perform thoracoplasties involving as many as six ribs and to perform extrafascial apicolysis under conditions far more favorable than those obtained in making the usual incisions around the scapula. The cutaneous incision is oblique, starting at the seventh cervical vertebra (the prominent one) and extending as far as 3 cm. below the angle of the scapula. The upper part of the incision does not have to reach the seventh cervical vertebra but starts at 1 cm. from it; if necessary, its lower extremity may be prolonged along the spinal border of the scapula. This incision allows a favorable approach to the most difficult point in surgical treatment of pulmonary tuberculosis: ablation of the first rib, the key of the thoracoplasty. With this incision the ribs can be viewed one after the other. Extrafascial apicolysis is much more easily performed with this incision, as the apex of the lung is exactly in the center of the wound. A set of instruments suitable for the operation is necessary. The authors describe their use. They consist of

two Semb retractors, two strong double-bent retractors, three rugines, Brünner's costostome for costostomy and two spatulas of the type employed by Semb. The scapula can be easily retracted in spite of the preservation of its muscles. This is done by putting the patient flat on his stomach and raising the arm, which places the bone in the sagittal plane and entirely disclosed from the thorax. It is maintained in this position by means of a retractor. Some of the advantages of this incision, the authors point out, are that it provokes little hemorrhage and, as the muscle is not cut, it does not cause shock. Reconstruction is simple: the ascending fibers of the trapezius muscle which have been cut must be carefully sutured. The dissociated muscular parts are brought together by means of two sutures, as in McBurney's incision. The results are excellent. For the last two years the authors have used this incision for all thoracoplasties and extrafascial apicolyses.

Appendicitis.—The thesis that appendicitis in the majority of cases is a form of closed loop obstruction is developed in this paper. Bowers shows that in 80 per cent of 485 cases in his series the condition was on an obstructive basis and that in 67 per cent an impacted fecalith was the obstructing mechanism. He demonstrates that there is a direct correlation between the presence of a fecalith and subsequent development of obstruction with closed loop formation, eventuating in perforation and peritonitis if the obstruction is not overcome by expulsion of the fecalith or release of the obstruction by other means.

Morbidity from Operative Complications.—Of the 450 patients that Beck observed for operative complications (wound infections and pulmonary lesions) 332, or 73.8 per cent, had an uneventful convalescence, whereas 118, or 26.2 per cent, had some complication during the postoperative course; only "clean" operations were selected for the study. In no case was more than one complication reported. This may be due to lack of observation on the part of the person filling out the report but is more probably due to the fact that the presenting complication overshadowed the secondary one. There were five deaths in the series. Surgical shock and "gas pains" are not being considered. In the series there were fifty-six wound complications, most of which resulted from hematomas in the wound. When the edges of the wound are slightly raised and reddened, a hypodermic needle inserted into the wound will usually aspirate a small or moderate amount of old blood or of blood-stained purulent material; these are small hematomas rather than infections. Most of the twenty-eight pulmonary ailments in the group were classified as bronchitis. Whether or not this minor bronchitis represented small areas of atelectasis is not in the province of this discussion. There were eight lesions definitely classified as atelectatic. There were thirteen patients with complications referable to the urinary tract. There was usually mild cystitis, although there was one instance of violent cystopyelitis which resisted therapy. Only six of the patients had had retention of urine requiring catheterization. The complication arose most frequently in young persons. Thrombophlebitis of the femoral vein occurred in only two persons in the entire series. The other complications were so inconstant that discussion of them is not indicated. Many factors enter into the pathogenesis of the complications. To evaluate any one of them, all of the others must be kept at an absolute or relative value. However, in reviewing the practical lessons learned from the study, the author finds that probably the most important is that an explanation can usually be found for a temperature which remains over 99.6 F. for more than four days. If one is alert for this sign, one will be able to "pick up" far more of the complications which beset the surgical patient. If the complications are faithfully recorded, a cause and a cure for some of them will undoubtedly be found.

Bulletin New York Academy of Medicine, New York

15: 493-576 (Aug.) 1939

- Observations on Pathology of Rickets, with Particular Reference to Changes at Cartilage Shaft Junctions of Growing Bones. E. A. Park, Baltimore.—p. 495.
Therapeutic Use of Vitamin C. G. Dalldorf, Valhalla, N. Y.—p. 544.
Use of Tetanus Toxoid in Private Practice. R. P. Rogers, Greenwich, Conn.—p. 553.
Influence of Emotional Factors on Physiologic and Pathologic Processes. F. Fremont-Smith, New York.—p. 560.
Role of New York Academy of Medicine in Development of American Museum of Health. G. Baehr, New York.—p. 570.

Georgia Medical Association Journal, Atlanta

28: 305-348 (Aug.) 1939

- Some Problems of Industrial Practice, with Special Reference to Treatment. R. L. Rhodes, Augusta.—p. 305.
- Treatment of Fractures in a Small Community Hospital. C. H. Watt, Thomasville.—p. 307.
- Some Ethical and Legal Aspects of Industrial Practice. J. W. Simons, Brunswick.—p. 312.
- Operative Treatment of Inguinal Hernia. L. S. Fallis, Detroit.—p. 316.
- Lesions in Spinal Cord in Mental Disease and Defect Recognized by Myelin Sheath Stain: Report of 600 Unselected Cases with an Appendix on Technic. Myrtelle M. Canavan, Boston.—p. 324.
- Prophylaxis Against the Common Cold. H. Joiner, Gainesville.—p. 332.

Illinois Medical Journal, Chicago

76: 101-200 (Aug.) 1939. Partial Index

- Integration of Personality Factors in Diagnosis and Treatment. L. E. Parkins, Boston.—p. 119.
- Röntgen Consideration of Lesions In and About the Larynx: Diagnostic Aspects. A. Hartung, Chicago.—p. 125.
- Id.: Therapy. T. J. Wachowski, Chicago.—p. 128.
- Suggestive Treatment of Maxillary Sinusitis Subsequent to Dental Surgery. J. S. Clark, Freeport.—p. 130.
- *Current Conceptions in Epilepsy. M. Brown, Chicago.—p. 132.
- Measles in 1938: Analysis of 400 Cases: Twenty-Eight Instances of Encephalitis. A. L. Hoyne, Chicago.—p. 136.
- Early Diagnosis and Treatment of Poliomyelitis with Poliomyelitis Antistreptococcus Serum. E. C. Rosenow, Rochester, Minn.—p. 144.
- Hospital Management of Tuberculosis in the Psychotic. S. A. Leader, North Chicago.—p. 149.
- Differential Diagnosis of Chronic Abdominal Disease. H. P. Miller, Rock Island.—p. 154.
- Some Observations on Cerebral Hemorrhage in the Newborn. H. N. Sanford, Chicago.—p. 162.
- *Sudden Death: Anatomic Findings. B. Markowitz, Bloomington.—p. 170.
- Colloidal Mercury Sulfide and Wassermann Fastness. S. J. Zakon and M. A. Jacobson, Chicago.—p. 172.
- Anchoring Elusive Breast Tumor. E. I. Greene and J. M. Greene, Chicago.—p. 178.
- Calcium Therapy in Diseases of Cardiovascular System. E. Podolsky, Brooklyn.—p. 179.

Current Conceptions in Epilepsy.—Brown states that it has been clearly demonstrated that epilepsy and other nervous and mental diseases occur more frequently among the ancestors and collateral relatives of deteriorated persons with epilepsy than among the general population. The offspring of persons with epilepsy are susceptible to it and defective mental development or other neuropsychiatric disorders. In a study of the hereditary factors in epilepsy, in which the records of non-deteriorated epileptic patients were used, it was found that the hereditary backgrounds of these patients are tainted with neuropathic disturbances to a significantly less degree than are those of deteriorated patients. Epilepsy occurred in only one of 342 children born to 163 extramural patients with the same disorder. Infantile convulsions occurred in six of these children. The deteriorated and nondeteriorated patients with epilepsy, it appears, show a distinct and significant difference in the relation of hereditary factors to their disorder. There are constitutional or inborn differences between mentally deteriorated and nondeteriorated epileptic patients. Not only are there important clinical differences between the mentally normal person with epileptic seizures and the psychotic epileptic, but the differences in hereditary background and in native or constitutional makeup suggest the existence of a fundamental distinction between these two groups of patients.

Sudden Death.—Sudden death in an apparently healthy individual or unexpected death in an individual known to be chronically ill raises many medical and legal problems. Markowitz explains that the primary medical problem is easily solved if sufficient anatomic changes are found which justify a cause for sudden death. There are instances, however, in which necropsy fails to reveal such anatomic justification. Yet testimony is constantly being given by physicians and lay coroners who have little or no information on the subject. The primary legal problem depends entirely on the medical observations. Probably the most common anatomic changes in these cases refer to the heart. Coronary changes are of extreme importance in cases of sudden heart death. There are coronary arterial changes, such as calcified and atheromatous plaques, which cause narrowing of the lumen but no occlusion; in these cases it is difficult to give an anatomic cause for sudden death. In syphilis the coronary arteries are but little involved but the aorta is puckered to such a marked degree that it may produce sudden

death by occlusion of the mouth of the coronary artery. Syphilis as an entity may be blamed for sudden death in other instances such as rupture of the aorta or cerebral vessel through a syphilitic aortitis or rupture of a syphilitic aneurysm. Aneurysm is one of the most common complications of syphilitic aortitis, especially in Negroes, in whom it is found twice as often as in the white race. Next to the heart, the brain is probably the most frequent seat of anatomic changes which produce sudden death. Sudden deaths due to pulmonary disturbances or edema of the larynx are often encountered but rarely without history of some previous disease. Pulmonary embolism, a definite anatomic observation in explaining sudden death, usually follows some operative procedure or history of thrombophlebitis. Fat embolism following fracture may cause sudden death, sometimes occurring many hours after the patient is in apparently good condition. It is questionable whether air embolism, which is so often feared, is ever a cause of sudden death. In all cases of pulmonary and laryngeal deaths the history of the antecedent illness is of extreme importance. In cases of shock, whether anaphylactic or surgical, anatomic evidence of death is difficult to demonstrate. The mechanism of death is unknown; the theoretical explanation of a neurocirculatory disturbance bears some weight in view of the minor injuries and even emotional distress which may precipitate shock. Sudden death may occur of an individual who has been on a prolonged drinking spree. The history in these cases usually indicates chronic alcoholism and anatomically the essential signs are extreme fatty degeneration of the liver with varying degrees of cerebral edema. Death is most likely due to hepatic insufficiency.

Journal of Lab. and Clinical Medicine, St. Louis

24: 1119-1226 (Aug.) 1939. Partial Index

- *Effect of Vitamin C on Lead Poisoning. H. N. Holmes, Kathryn Campbell, Oberlin, Ohio, and E. J. Amberg, Toledo, Ohio.—p. 1119.
- Comparison of Tests for Insulin Sensitivity. P. H. Burgert, W. H. Nadler and Ruth Stott, Chicago.—p. 1128.
- Gluconic Acid as Urinary Acidifying Agent in Man. H. Gold and Helen Civin, with assistance of C. Salzman, New York.—p. 1139.
- Staphylococcus Epidermis Albus: Cultural and Immunologic Reactions of Large and Small Colony Types. Esther Meyer, Chicago.—p. 1145.
- Study of Enzymes in Normal and Pathologic Cerebrospinal Fluid. I. Kaplan, D. J. Colin, A. Levinson and B. Stern, Chicago.—p. 1150.
- *Normal Hematologic Standards in the Aged. I. Miller, Staten Island, N. Y.—p. 1172.
- Short Cut in Gas Analysis. F. S. Cotton, Sydney, Australia.—p. 1177.
- Detection of Blood by Means of Chemiluminescence. F. Proescher, San Jose, Calif., and A. M. Moody, San Francisco.—p. 1183.
- Determination of Sulfanilamide in Tissue, Urine and Blood: Modification of Marshall's Method. F. T. Maher and W. J. R. Camp, Chicago.—p. 1198.
- Method of Isolating Larvae of Trichinella Spiralis for Preparation of Antigen Used for Immunologic Reactions in Trichinosis. H. Tsuchiya, St. Louis.—p. 1207.
- Free Chlorine as Source of Error in Blood Sugar Determinations. A. K. Anderson and I. Zipkin, State College, Pa.—p. 1209.

Vitamin C in Lead Poisoning.—After physical examination of 400 men exposed daily to lead, Holmes and his colleagues made monthly checks on the basophilic aggregation of the blood smear and on the degree of stippling. Records of these monthly tests were kept throughout the year of observation. During the last three months of this period weekly tests were recorded on a cooperative group of thirty-four men, all of whom had symptoms and showed signs of chronic lead poisoning. In these men differentials were also recorded on the Wright smear. From April 1937 to Nov. 15, 1937, from 80 to 100 grains (5.2 to 6.5 Gm.) of the gluconate, lactate and diphosphate salts of calcium were given to these thirty-four men. In addition, vitamin D (940 units) and vitamin A (9,400 units) were given daily. The observation was made that the symptoms and signs exhibited by these men were similar to those found in subclinical scurvy. Ascorbic acid (100 mg. of vitamin C daily) oral therapy was instituted in the group of thirty-four patients with chronic lead poisoning: seventeen were given ascorbic acid alone (at least two months after discontinuing the calcium salt injections), while the others continued the calcium therapy and at the same time took tablets of ascorbic acid. In general, the first group of patients showed a marked improvement in vigor, cheerfulness, color of skin and blood picture. In a week or less after beginning the treatment most of the men enjoyed normal sleep, lost the irritability and nervousness so common with high calcium treatment of lead poisoning, enjoyed their food more, and no longer had tremors (if observed before). Several cases

of leukopenia (probably due to previous prolonged calcium therapy) were cured by the ascorbic acid treatment. In the second group the gain was less marked and rather irregular. There was no gain in the number of mature neutrophils in the blood, in strange contrast with the rapid gain when ascorbic acid alone was given. In several instances alcohol nullified the good effects of calcium as well as of ascorbic acid, a complication that workmen exposed to lead hazards would do well to avoid.

Normal Hematologic Standards in the Aged.—In determining the normal hematologic standards of 160 men more than 60 years of age, Miller found that the erythrocytes per cubic millimeter of blood are diminished in old age. The average erythrocyte count is 4,460,000. Chronic low grade infection, nephrosclerosis and decreased cellularity of the red bone marrow in old age may be causative factors. Hypertension did not produce an increase in the erythrocytes. The hemoglobin per hundred cubic centimeters of blood is decreased in the aged, the average being 14.3 Gm. The decrease in hemoglobin is proportional to the decrease in the erythrocytes. The leukocytes and differential counts are within normal limits.

Maine Medical Association Journal, Portland

30: 189-212 (Aug.) 1939

- Medicolegal Problems. A. W. Stearns, Boston.—p. 189.
Sulfapyridine Therapy in Pneumonia. L. A. Parrella and E. E. Brown, Lewiston.—p. 196.
The Pneumococcus and Sulfanilamide: Report of Two Cases. H. I. Goldman, Freeport.—p. 202.

New England Journal of Medicine, Boston

221: 209-250 (Aug. 10) 1939

- Epilepsies: Note on Radical Therapy. W. Penfield, Montreal.—p. 209.
Role of Cervix in Pregnancy and Labor. F. L. Good, Boston.—p. 219.
Acute Gonococcal Tenosynovitis: Report of Seven Cases. E. Hamlin Jr. and S. P. Sarris, Boston.—p. 228.
Agranulocytosis Caused by Sulfanilamide: Report of Recovered Case. I. L. Cutler and E. J. Crane, Rutland, Mass.—p. 231.
Allergic Diseases. F. M. Rackemann, Boston.—p. 234.

221: 251-290 (Aug. 17) 1939

- Chronic Organic Arterial Disease. E. A. Edwards, Boston.—p. 251.
Nerve Injuries in Supracondylar Fractures of Humerus in Children. G. G. Bailey Jr., Boston.—p. 260.
Treatment of Lobar Pneumonia with Sulfapyridine. M. Cutts, C. F. Gormly and A. M. Burgess, Providence, R. I.—p. 263.
Granulocytopenia Following Surgical Sepsis and Treated with Adenine Sulfate. E. L. Richmond, Worcester, Mass.—p. 267.
Industrial Medicine. W. I. Clark, Worcester, Mass.—p. 269.

Treatment of Lobar Pneumonia with Sulfapyridine.—Cutts and his associates state that of the eighty-four patients with lobar pneumonia treated at the Rhode Island Hospital during the past winter only twenty-two were treated only with serum, forty-four were treated with sulfapyridine alone, thirteen with serum and the drug and five, entering the hospital after the fifth day of their disease, received no drug or serum therapy. Patients given both the drug and serum were not chosen because of any greater severity of their illness. Severe pneumonia was present in all groups in about equal proportions. Analysis of the duration of the disease at the time of admission showed that those in the serum-treated group averaged 2.4 days while those treated with the drug alone averaged 3.2 days. In the group of patients receiving combined treatment the average duration was two days. The average age of the drug treated patients was 42 and the age of those who were serum treated was 43, while those receiving both serum and the drug averaged 50 years. There was one death among the patients receiving sulfapyridine alone, three among those treated with serum and the drug, two of the serum treated patients died and three of the five patients admitted to the hospital after the fifth day of illness and receiving no treatment died. The authors made an attempt to grade all cases as to the therapeutic response, taking into consideration the number of lobes involved, the day of the disease when treated, blood cultures, age of the patient, type of infecting organism, temperature response and presence of complications. According to this classification 90 per cent of the drug treated cases yielded good results, as compared to 73 per cent of the serum treated group. From their results the authors infer that at least in the great majority of cases sulfapyridine exerts no serious toxic effects if used in the dosage described. How-

ever, nausea and vomiting were quite troublesome. The occurrence of both rash and drug fever in the two patients receiving more than 40 Gm. of the drug suggests that these large doses should be used with caution. Agranulocytosis or acute hemolytic anemia was not encountered, but their known occurrence in occasional cases makes frequent blood counts and close observation essential. In the authors' experience sulfapyridine was equally effective in all types of pneumonia, with the exception of that caused by the type III pneumococcus.

New York State Journal of Medicine, New York

39: 1447-1524 (Aug. 1) 1939

- Anxiety in Relationship to Hyperthyroidism. G. M. Beck, Buffalo.—p. 1453.
Value of Tuberculin Skin Tests in School Program. W. E. Ayling, Syracuse.—p. 1463.
Studies in Water Metabolism in Relation to Nervous System. R. T. Bellows, Rochester.—p. 1470.
Limitations of Injection Treatment of Hemorrhoids. S. D. Manheim and L. J. Druckerman, New York.—p. 1473.
Electrolysis: Surgical Procedure. A. C. Cipollaro, New York.—p. 1475.
Value of Irradiation in Cancer of Breast. W. J. Hoffman, New York.—p. 1481.
Circulation of Joints of Chronic Arthritis. J. W. Ghormley and A. Silverglade, Albany.—p. 1489.
Allergic Manifestations in Central Nervous System. T. W. Clarke, Utica.—p. 1498.

Oklahoma State Medical Assn. Journal, McAlester

32: 283-316 (Aug.) 1939

- Stricture of Urethra. J. W. Rogers, Tulsa.—p. 283.
Postoperative Management of Tonsillectomies. G. E. Haslam, Anadarko.—p. 286.
Bladder Infections in the Female. D. W. Branham, Oklahoma City.—p. 290.
Examination of Contacts: Factor in Syphilis Control. M. I. Shanholtz, Wewoka.—p. 292.
Emergency Treatment of Airplane Injuries. R. L. Fisher, Frederick.—p. 296.

Philippine Islands Med. Association Journal, Manila

19: 337-394 (June) 1939

- Studies on Vitamin C: V. Vitamin C Content of Normal Filipino Blood. I. Concepcion and P. Paulino, with technical assistance of Solita F. Camara and Maria Luisa Gargaritan, Manila.—p. 337.
Pathology and Bacteriology of Ileocolitis in Children. B. Barrera, Manila.—p. 345.
Nature of Causative Agent of Cancer from Standpoint of New Concept of Bacteriophage, Its Action and Role. J. F. Leyva, Manila.—p. 351.

Review of Gastroenterology, New York

6: 281-366 (July-Aug.) 1939

- Terminal (Regional) Ileitis: Report of Case. R. L. Waugh, New Orleans.—p. 281.
Regional Colitis: Report of Two Cases. J. A. Dubins, Boston.—p. 293.
Peptic Ulcer Therapy. M. B. Levin, C. H. Burton, R. Roseman and H. Eisenberg, Baltimore.—p. 299.
Method of Treating Peptic Ulcer Based on Symptomatology and Pathology. A. Bassler, New York.—p. 306.
Report of Some Unusual Gastrointestinal Cases. A. A. Herold, Shreveport, La.—p. 312.
Effect of Gastric Hydrochloric Acid and Certain Factors on Number of Colon Bacilli in Feces. W. B. Rawls and G. H. Chapman, New York.—p. 317.
Gastrointestinal Allergy. W. Lintz, Brooklyn.—p. 320.
Modern Concepts of Cardiospasm. N. W. Chaikin, New York.—p. 332.
Studies on Vitamin C Metabolism: New Sursaturation Test. M. Vauthey, Vichy, France.—p. 337.
Tyrosinemia and Takata-Ara Tests in Cirrhosis of Liver. I. R. Jankelson, M. S. Segal and M. Aisner, Boston.—p. 341.
Relation of Liver and Gallbladder Disease to Arthritis. Vera L. Collins, Yonkers, N. Y.—p. 344.

Gastrointestinal Allergy.—Lintz discusses a class of patients (472) suffering from various digestive disturbances who are incapacitated and yet not sick enough to go to bed. Incompletely digested foreign proteins gain access to the circulation not only in these patients but in almost every one. These proteins are merely the exciting agents that set off the patients' cells which inherently react in an abnormal manner. For instance, the symptoms of asthma are always the same, irrespective of the agent producing it. The author is of the opinion that these patients lack or are deficient in a certain poison neutralizing ferment, transmitted according to laws of heredity, which normal people possess. He is convinced that the only difference between normal people and allergic people is one of degree. The nonallergic person can simply tolerate larger doses of the allergens. While 10 per cent of the population suffers from major allergy, more than half of us manifest mild and infrequent allergic symptoms at one time or

another. Who does not know of some food or other substance that gives him clogged nose, sneezing spells, colds, coughs, dyspnea, headache, rashes, itching, suggestive mild hay fever, asthma, migraine and cutaneous allergy? Of all the manifestations of allergy the author states that he finds the gastrointestinal form by far the most frequent. This is to be expected in view of the fact that allergens act mainly on the unstriated muscle cells, the vascular and the autonomic nervous system and the secretory glands. The history is by far the most important point in the diagnosis and treatment of these patients. There are three phases to this factor: 1. The patient usually presents other allergic manifestations. 2. A family history of allergy will usually be found. In 70 per cent of these cases the family history was positive for allergy. 3. History of attacks attributed to allergens is almost always elicited. The autonomic nervous system plays a most important part in the production of gastrointestinal allergy and explains its apparent vagaries as to why a patient can tolerate a food at one time and not at another. It is overstimulation of the vagus that is chiefly concerned with allergy, for the vagus causes increased secretion, spasticity, excessive mucus formation, colic, hyperirritability and increased vascular permeability, which sequence of events occurs in allergy. The plurality of digestive complaints and the dominance of the nervous symptoms are suggestive of allergy. It is suggested that herpes occurring in the stomach and duodenum and its digestion is responsible for certain peptic ulcers. Nonbeneficial operations of all sorts should arouse a suspicion of allergy. The history and symptoms are more reliable than the dermal tests. Coffee not only produces allergic symptoms but makes patients more susceptible to other allergens. A spastic intestine is responsible for hemorrhoids. Organic disease should be ruled out and allergy should be made as the last diagnosis.

Southwestern Medicine, El Paso, Texas

23: 247-280 (Aug.) 1939

- Splanchnic Anesthesia. C. H. Arnold and L. V. Gibson, Lincoln, Neb.—p. 247.
 Brachial Block Anesthesia. C. H. Arnold and L. V. Gibson, Lincoln, Neb.—p. 249.
 Artificial Pneumothorax. D. W. Melick, Madison, Wis.—p. 250.
 Differentiation of Parietal and Intra-Abdominal Pain. Z. B. Noon, Nogales, Ariz.—p. 254.
 Common Feeding Difficulties in Pediatric Practice. J. T. Bennett, El Paso, Texas.—p. 257.
 Tuberculosis of Tonsil: Résumé of Literature with Report of Case. E. H. Brown, Tucson, Ariz.—p. 260.
 Dermatitis from Cosmetics. L. M. Smith and R. P. Hughes, El Paso, Texas.—p. 263.
 Hematuria and Abdominal Pain Associated with Sulfapyridine. V. M. Ravel and W. R. Curtis, El Paso, Texas.—p. 264.
 Sulfanilamide Therapy in Mastoiditis. L. F. Morrison, San Francisco.—p. 265.

Surgery, St. Louis

6: 167-326 (Aug.) 1939

- Anesthetic Management of Patients with Hyperactive Carotid Sinus Reflex. E. A. Rovenstine and S. C. Cullen, New York.—p. 167.
 Anesthesia, Anesthetic Agents and Surgeons. E. R. Schmidt and R. M. Waters, Madison, Wis.—p. 177.
 Massive Adenomatous Goiter Successfully Removed: Case Report. C. E. Rea, Minneapolis.—p. 183.
 Carcinoma of Parathyroid Gland. K. A. Meyer, P. A. Rosi and A. B. Ragins, Chicago.—p. 190.
 *Surgical Exploration and Closure of Patent Ductus Arteriosus: Report of Second Successful Case. R. E. Gross, P. Emerson and H. Green, Boston.—p. 201.
 *Bleeding Tendency in Obstructive Jaundice and Its Correction by Means of Vitamin K. K. B. Olson and Hildegard Menzel, New York.—p. 206.
 *Conservative Surgery with Irradiation in Gas Gangrene Infection. R. L. Sewell, Rochester, N. Y.—p. 221.
 Woody Phlegmon of Neck. F. H. Straus, Chicago.—p. 230.
 Penetrating Stab Wounds of Abdomen and Stab Wounds of Abdominal Wall: Review of 184 Consecutive Cases. L. T. Wright, R. S. Wilkinson and J. L. Gaster, New York.—p. 241.
 Spontaneous Hematoma of Abdominal Wall. J. O. Lisenby, Atmore, Ala.—p. 261.
 Muscle Flap Repair of Perforations in Larger Arteries of Dogs. R. M. Isenberger, with assistance of M. C. Carroll, Kansas City, Kan.—p. 265.
 Linitis Plastica of Colon: Case Report. J. R. Judd, N. P. Larsen and I. L. Tilden, Honolulu, Hawaii.—p. 278.

Closure of Patent Ductus Arteriosus.—Gross and his colleagues report the case of an 11 year old boy who had typical physical and x-ray signs of a patent ductus arteriosus. As the child had been followed over a period of several years,

there had been slight but definite hypertrophy (or dilatation) of the heart, this change being presumably caused by the large shunt between the aorta and the pulmonary artery. In the attempt to reduce the work of the heart imposed by the shunt and also to lessen the danger of subacute bacterial endarteritis, surgical exploration was undertaken for obliterating the ductus. The vessel was found to be from 11 to 12 mm. in diameter and was successfully ligated. The patient stood the operative procedure with extremely little reaction. This is the second case to be reported.

Bleeding Tendency and Vitamin K.—Olson and Menzel determined the plasma clotting time of twenty-four patients with obstructive jaundice. Twelve of the patients were considered to have bleeding tendencies because of abnormally prolonged plasma clotting times. The other twelve had normal plasma clotting times, though three bled after operation and in two of these cases the plasma clotting time became markedly prolonged before bleeding occurred. These fourteen patients were treated preoperatively with vitamin K concentrates and bile salts. All but one patient had marked improvement of the plasma clotting time. Seventy-five per cent of the patients with bleeding tendencies, but not treated with vitamin K, bled postoperatively, whereas only 36 per cent of those treated with vitamin K had postoperative bleeding complications. No patient had serious bleeding while receiving treatment. Since vitamin K and bile salts decrease the bleeding tendency in obstructive jaundice, their use is recommended in all cases of jaundice both preoperatively and postoperatively.

Conservative Surgery with Irradiation in Gas Gangrene.—According to Sewell, in the seven years prior to 1935 twelve cases of clinical gas gangrene of the extremities were seen at the Strong Memorial Hospital. In four of these gangrene developed in the stump following amputations for other causes. In the other eight cases, on recognition of the infection, immediate amputation was advised and performed except in one instance, in which it was refused. This patient received only a small amount of serum and lived; while, of the remaining seven, four died on an average of twenty-four hours after the therapeutic amputation. In the following eighteen months, with the introduction of roentgen therapy and sulfanilamide, of five patients with both clinical gas gangrene and positive cultures, two died, both aged men. One had severe diabetes and lived for three days after a midhigh amputation. It is regrettable that more reports concerned with irradiation in gas gangrene have not appeared in the general surgical journals, for, although most roentgenologists are well informed of the merits of this mode of therapy, it has not been brought sufficiently to the eyes of the general surgeon. Since the introduction of irradiation and sulfanilamide, it has been amply shown that the infection can be controlled and cured without amputation and even without surgery in numerous cases in which, several years ago, immediate operation would undoubtedly have been performed.

Tennessee State Medical Assn. Journal, Nashville

32: 263-302 (Aug.) 1939

- Pellagra: Discussion of Diagnosis and Treatment of Clinical Disease and Borderline States. J. B. McLester, Birmingham, Ala.—p. 263.
 Metrazol Treatment of Dementia Praecox. H. B. Bracken, Nashville.—p. 268.
 Differential Diagnosis of Diarrheas. T. J. Manson, Chattanooga.—p. 276.

West Virginia Medical Journal, Charleston

35: 345-398 (Aug.) 1939

- Achievements and Responsibilities of Our State Association. R. M. Bobbitt, Huntington.—p. 345.
 Diagnosis and Surgery of Traumatic Abdomen. N. W. Gillette, Toledo, Ohio.—p. 349.
 Endoscopy: Its Relation to Everyday Practice. W. F. Zinn, Baltimore.—p. 355.
 The Discharging Ear. J. H. Moore, Huntington.—p. 358.
 Hagedorn Era in Diabetes Mellitus. L. C. McGee and J. E. Martin Jr., Elkins.—p. 361.
 Simultaneous Occurrence of Spontaneous Hypoglycemia and Juvenile Tabes: Case Report. D. C. Ashton, Beckley.—p. 369.
 Treatment of Transcervical Fracture of Hip with Smith-Petersen Nail. C. C. Garr, Lexington, Ky.—p. 371.
 Pneumococcal Meningitis Treated with Sulfapyridine and Specific Serum: Case Report. J. D. Cole and E. F. Hurteau, Clarksburg.—p. 373.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 209-264 (July 29) 1939

- Retrospect on Forty Years of Practice. T. Fraser.—p. 209.
Pharmacologic Actions and Therapeutic Uses of Some Compounds Related to Adrenalin. J. A. Gunn.—p. 214.
Causation of Delayed Union and Nonunion of Fractures. R. I. Stirling.—p. 219.
Treatment of Ununited Fractures. N. Dunn.—p. 221.
Foreign Bodies Introduced into Bladder in Attempts to Procure Abortion: Report of Case. A. H. Charles.—p. 224.

Indian Medical Gazette, Calcutta

74: 385-448 (July) 1939. Partial Index

- Use of Dyes in Various Fungal Infections. P. A. Maplestone and N. C. Dey.—p. 391.
Malarial Infection in Placenta and Transmission to Fetus. B. M. Das Gupta.—p. 397.
Abdominal Tumor Caused by Gnathostoma Spinigerum (Owen, 1836). S. Daengsvang.—p. 399.
Treatment of Cholera (Note on Results of Treatment by Different Methods). C. L. Pasricha, A. J. H. deMonte, B. C. Chatterjee and A. Samad Mian.—p. 400.
Thrombo-Angiitis Obliterans: Report of Case Treated by Lumbar Ganglionectomy. M. Sein.—p. 404.
Tumors of Upper Jaw and Its Immediate Neighborhood. V. M. Kaikini.—p. 406.
Scarabiasis or Presence of Beetles in Intestine. C. Strickland and D. N. Roy.—p. 416.

Lancet, London

2: 237-296 (July 29) 1939

- Forty Years of Practice: A Retrospect. T. Fraser.—p. 237.
*Acute Hyperparathyroidism. W. A. Oliver.—p. 240.
*Effect of Sulfonamides on Blood Serum. G. A. Scott and O. Meerapfel.—p. 244.
Chloroma: Case I. G. Jones.—p. 246.
Reduction of Potassium Tellurite in Diphtheria and Other Throat Conditions. K. E. Cooper, B. A. Peters, J. Wiseman and J. M. Davies.—p. 248.
*Insulin Premedication in Convulsion Therapy. D. E. Sands.—p. 250.
Use of Pentothal Acid in Midwifery. G. C. Steel.—p. 251.
Thrombosis After Injection of Pentothal Sodium. F. Evans.—p. 252.

Acute Hyperparathyroidism.—Oliver suggests that the clinical syndrome including vomiting, loss of weight, anorexia, bone pains, constipation and lassitude, all of them recently exacerbated, with increasing drowsiness, evidence of fever, disproportionate tachycardia and impaired renal function without hypertension should prompt a careful examination of the neck for a parathyroid tumor, estimation of the serum calcium and phosphorus and x-ray study of the kidneys. From the experiments of several investigators it appears clear that the ill effects may be reversible and that, if suitable fluid and electrolyte replacement is carried out and followed by removal of the tumor, good results may be expected; therefore recognition of the condition and its speedy confirmation by investigation are of considerable importance. Two cases of parathyroid chief-cell adenomas are reported and it is believed that they constitute examples of a clinical syndrome—acute hyperparathyroidism—which, if recognized, is amenable to therapy.

Effect of Sulfonamide Derivatives on Blood Serum.—Scott and Meerapfel describe two cases in which treatment with a sulfonamide derivative over a long period and in large doses (423 grains [27.5 Gm.] of uleron [dimethyl disulfanilamide] in one case and 748 grains [48.6 Gm.] of sulfanilamide in the other) was followed by an alteration in the blood serum which precluded the finding of a suitable donor for blood transfusion. Normal serum treated in vitro with sulfanilamide for four days or more agglutinated the red blood cells of donors of the corresponding blood group and the cells of universal donors. When these drugs were administered over shorter periods and in smaller doses to six other patients, such a change in the blood serum did not take place.

Insulin Premedication in Convulsion Therapy.—The resistiveness, panic and fear accompanying convulsion therapy have been eliminated by Sands with insulin premedication of twenty-two of twenty-three schizophrenic patients. The insulin premedication has enabled him to complete convulsant treatments of the twenty-two patients which would otherwise have had to be terminated prematurely because of resistance and apprehension. In the instance in which treatment was stopped it

was done because of the excessive exacerbation of symptoms on recovery from each convulsion. The patient's condition deteriorated and it was considered inadvisable to continue the treatment. The high proportion of "negative fits"—30 per cent—which these resistive patients had without insulin was reduced to 13 per cent with insulin. There have been but three patients discharged and one has since relapsed. This is an inferior figure compared with most of the published statistics and those of Claybury, the discharge rate being 42 per cent. This use of insulin, by greatly diminishing the unpleasantness of convulsion treatment to resistive schizophrenic patients, has facilitated their nursing and management. The object in insulin premedication is to give such a quantity as will induce the patient to cooperate with the injection of a convulsant drug. The dose may require pushing until drowsiness and languor supervene. On almost every occasion the induction of the fit has been sufficient to dispel any lethargy induced by the insulin. The patients are given sugared tea to drink as soon as the convulsion is over. In two cases, owing to the development of insulin sensitivity, recovery was effected with dextrose solution through the nasal tube on one occasion and with intravenous dextrose on two other occasions. As with metrazol therapy, the management of the premedication can be performed by the ordinary nursing staff of the mental hospital without the usual special training generally necessary for insulin shock therapy.

Medical Journal of Australia, Sydney

2: 123-154 (July 22) 1939

- Anesthesia and Pulmonary Atelectasis. S. V. Marshall.—p. 123.
Massive Collapse of Lung. W. A. Bye.—p. 129.
Treatment of Some Common Disorders Encountered in Industrial Practice. N. Little.—p. 135.

Japanese Journal of Experimental Medicine, Tokyo

17: 239-332 (June) 1939

- Studies on Influence of Bacilli Designated as N, M or J on M and N Agglutinogens of Human Blood Corpuscles. K. Shimada.—p. 239.
Studies on Changes in Blood Sugar Content During Fever. I. Ohtake.—p. 249.
Bacteriologic and Immunologic Investigations on Type B Salmonella. S. Tsuchiya.—p. 269.
Combined Active Immunization Against Smallpox and Typhoid Fever: Experimental Studies. H. Yaoi.—p. 295.
*Practicability of Combined Active Immunization Against Smallpox and Typhoid Fever: Clinical Studies. H. Yaoi, S. Hirose and Y. Sudzuki.—p. 305.
Clinical Studies on Disease Caused by Hymenolepis Nana (v. Siebold). K. Nishio.—p. 319.

Immunization Against Smallpox and Typhoid.—In order to test the efficacy of the combined active immunization against smallpox and typhoid, Yaoi and his associates vaccinated at three weekly intervals 7,054 unselected young adult technicians of the heavy metal industry and a few office workers with freshly prepared heat killed phenolized typhoid vaccine. However, only 74.81 per cent of this number received the three injections. The main complaints expressed by the evaders was fever, headache or malaise, besides reddening, swelling and pain, the severe local reactions. The ill effects which may be caused by the combined active immunization by means of the purified vaccine virus and typhoid vaccine were determined in 838 newly admitted technicians. Only the first of the three doses contained a mixture of purified vaccine virus and typhoid vaccine. Ill effects which appeared to be more severe than when typhoid vaccine alone was used were not observed. It was confirmed that the two antigens used acted quite independently in that nodules due to the vaccinia virus appeared on the fourth or fifth day, after the immediate local reaction subsided. From a study of the local reactions caused by the typhoid vaccine and the combined immunization the authors find that the allergic reaction caused by the typhoid vaccine is much more severe than that caused by the smallpox vaccine. After combined active immunization, serums drawn on the fifteenth day showed titers from 1:1,600 to 1:3,200 and in those drawn on the twenty-second day the titers ranged from 1:3,200 to 1:6,400. Thus it was decidedly confirmed that more rapid and effective immunization can be obtained by the combined method than in the case of typhoid vaccination alone. The comparison with two agglutinin figures after seventy-five days clearly demonstrated the superiority of the combined method (titers from 1:800 to 1:1,600) as compared with typhoid vaccine (titers from 1:400 to 1:800) with regard to the duration of immunity.

Presse Médicale, Paris

47: 1189-1204 (Aug. 2) 1939

B₁ Avitaminosis and Cardiac Insufficiency. L. Langeron.—p. 1189.

*Interpretation of Examination of Labyrinth in Aviators. W. Salem.—p. 1191.

Examination of Labyrinth in Aviators.—Salem says that at the otorhinolaryngologic clinic of the school of naval aviation in Rio de Janeiro they have about 200 records pertaining to examinations of the labyrinth of aviators. In the course of these examinations and of continuous control tests on aviators it was found that life as an aviator rapidly fatigues the organism and influences the vestibular apparatus. The more active the man is as a pilot, the weaker become his vestibular reactions. The rotatory test of Bárány is employed by the author only during the first examination; for experienced aviators he found the test of little value. He observed that the postrotatory nystagmus should not be interpreted by algebraic formulas and he gained the impression that it is advisable to adhere to the general medical principle that an isolated sign never has absolute value. The falling test, with the head inclined 90 degrees forward, he found of no clinical value, but he regards the caloric test as the best mode of examination of the labyrinth. He cites cases of hypo-excitability in experienced pilots and says that to him such hypo-excitability is of no clinical value. If such pilots have no other symptoms, they can continue their activity as aviators. The aviator acquires a sense of equilibrium superior to the normal. Aside from this, the labyrinthine sensitivity is nearly always diminished; this seems to be a phenomenon of adaptation. By itself hypo-excitability does not reveal a perturbation of the labyrinth and has no value in aviation. The author also mentions a case of labyrinthine hyperexcitability detected by caloric tests in a stunt flier. This man was permitted to continue ordinary flying but was advised not to do stunt flying and high altitude flying. On the basis of his observations the author reaches the following conclusions: 1. There exists a labyrinthine adaptability in aviators which modifies the reactions in the examinations on the vestibular apparatus. It is a relative modification and of no pathologic significance in aviation. 2. The labyrinthine hypo-excitability or hyperexcitability cannot be given uniform interpretations, but they must vary relatively in each case and in relation to each form of flying.

Schweizerische medizinische Wochenschrift, Basel

69: 737-756 (Aug. 19) 1939. Partial Index

*Creatinuria in Deficiency of Vitamin E and Its Cure by dl-Alpha Tocopherol (Synthetic Vitamin E). F. Verzar.—p. 738.

Action of Somifen on Blood Sugar Regulation of Human Subjects. Z. Horn.—p. 741.

Therapeutic Significance of Elimination of Calcium Acetyl Salicylate Which Lasts More Than Twelve Hours. F. Dellamartina.—p. 742.

Experimental Contribution to Blood Transfusion on Battle Fields. H. Knoll and H. Märki.—p. 744.

Creatinuria in Deficiency of Vitamin E.—Verzar says that creatine or creatinine originates in the endogenic muscular metabolism and also is taken in with the food, and that some investigators maintain that it develops also from arginine. Creatinuria is observed in different disturbances of the glycogen metabolism of the musculature but also in some endocrine disturbances. It has been observed in connection with hyperfunctioning of the anterior lobe of the hypophysis, in pregnancy and in hyperthyroidism. Moreover, in animals the administration of anterior hypophyseal and of sex hormones has been known to produce an increase in the elimination of creatine and a decrease in that of creatinine. Postlimatectic creatinuria has been suppressed by the administration of androgen. All these observations indicate that creatinuria may be elicited by reduction in the production of sex hormones or by disturbances in the anterior lobe of the hypophysis. New light was thrown on the problem of muscular dystrophy by the observation that certain diets elicited muscular dystrophy but that they failed to do so when they were complemented by wheat germ oil with its high vitamin E content. The author cites his own observations on the creatinuria of rats with muscular dystrophy, which were fed for a number of months with a diet lacking vitamin E. He further shows that it was possible to counteract the creatinuria of animals with muscular dystrophy by means of a synthetic vitamin E (dl-alpha-tocopherol acetate). He found that whereas the daily administration of 50 mg. of this synthetic vitamin E

produced some effect in the animals, 200 mg. daily was required to produce normal creatine values. The large quantities of synthetic vitamin E that are required for cure are surprising, because only small quantities of vitamin E are necessary to achieve a prophylactic effect. Experiments with synthetic vitamin E revealed that it effects fixation of creatine but that this fixation ceases as soon as does the administration. Regarding the point of attack of vitamin E in the organism, the author says that in 1930 he advanced the theory that it is in the anterior lobe of the hypophysis. He summarizes his discussion by stating that creatinuria is a result of a disturbance of the muscular metabolism on the one hand and of the reduction of the secretions of the anterior lobe of the hypophysis and of the sex glands on the other hand. The function of these two systems is impaired in case of deficiency of vitamin E. The administration of a synthetic vitamin E counteracts the dysfunction of both systems as well as their chief symptom, creatinuria, in that it effects fixation of creatine in the tissues.

Bol. de la Soc. Cubana de Pediatría, Havana

11: 363-442 (July) 1939. Partial Index

Elements of Diagnosis in Tuberculosis of Infants. T. Villedor.—p. 363.

*The Lung in Whooping Cough. R. Mendoza and J. Mir.—p. 399.

The Lung in Whooping Cough.—Mendoza and Mir carried out a clinical and x-ray study in a group of eleven children who had whooping cough. They found that, when the condition is benign, fever and physical signs of involvement of the respiratory tract do not appear and the respiratory tract appears normal on x-ray study of the chest. When fever and physical signs of involvement of the respiratory tract appear, the respiratory tract shows abnormal x-ray shadows of various extent and intensity, which disappear in about a week as fever abates and the physical signs of the respiratory tract disappear (unless complications occur). The tuberculin tests are (or become) negative in the course of whooping cough and remain negative after recovery of the patient. As a rule the abnormal x-ray shadows are located at the infra-hilus and juxtamedialastinal regions. Regularly they are bilateral and triangular, from the base (or else diaphragm or mediastinum) to the apex (or else the hilus) and may overshadow the hilocardial space. The transparency of the pulmonary fields is diminished in some cases. According to the author, the clinical evolution of the condition, the physical signs and the roentgenogram show that the alterations of the respiratory tract in whooping cough are due to general inflammation and cellular infiltration of all segments of the tract with early involvement of the bronchi, bronchiole and lung and the development of a consequent latent exudative pleuropulmonary condition which may evolve to different types of pneumonia, pleurisy or bronchopneumonia. That the infiltration is not of a tuberculous origin is proved by the following facts: (1) The patients do not have a history of tuberculosis, (2) the tuberculin tests are negative, (3) the symptoms, physical signs and x-ray alterations are of short duration and (4) the topography and character of the shadows do not show tuberculosis. The author believes that the role of whooping cough for the development or else aggravation of tuberculosis has been exaggerated. The negativity of the tuberculin tests in the course of the infection and after it (in cases of previous positive tests) do not necessarily indicate evolution of tuberculosis. He calls attention to the importance of a differential diagnosis between whooping cough and certain forms of spasmodic cough from tuberculous tracheobronchial adenopathies which may be erroneously diagnosed as whooping cough.

Endokrinologie, Leipzig

21: 305-448 (June) 1939

Interrelations of Thyroid and Adrenal Glands. E. Hoen, H. Langefeld and C. Oehme.—p. 305.

Ammonia-Induced Hypertrophy of the Adrenal Glands. I. G. Fazekas.—p. 315.

*Adrenal Cortex and Blood Pressure Regulation. S. Thaddea.—p. 338.

Study of Relationship Between Primary and Secondary Sex Organs of the Rat. R. Baum and B. Cunningham.—p. 345.

Effects of Violent Stretching of Neck of Function of Thyroid. R. Sanchez-Calvo.—p. 355.

Blood Pressure Regulation in Addison's Disease.—Thaddea reviews the clinical and experimental observations of other investigators on the blood pressure behavior and regulation of persons with Addison's disease, before and after treat-

ment with adrenal cortex extract. Systolic pressure values as low as 50 mm. of mercury and lower are not uncommonly found in Addison's disease, with diastolic values somewhat better. Persons with tuberculosis of the adrenal glands are said to show a somewhat higher pressure than those proved at necropsy to be without it. Patients with cardiac compensation are not affected by adrenal cortex extract; those with cardiac decompensation have an increase of systolic and diastolic pressure range after similar therapy. In Addison's disease, blood pressure is highly dependent on the position of the body, as tested with a tilting table and the measurement of patients during physical exertions such as standing, knee bending and leg raising. Patients with Addison's disease not therapeutically managed have an insufficiency of blood pressure regulation that may lead to collapse. Dysfunction of the regulatory mechanism may be due to "hypotonic" or "hypodynamic" disturbance. In the former, diastolic pressure in the upright position remains the same or rises; in the latter, diastolic pressure in the same position shows a decrease simultaneously with the systolic. Such "hypodynamic" regulatory disturbances are conditioned by the fact that vasoconstriction compensatorily necessary in the upright position fails to occur because of the absence of nerve impulses. "Hypodynamic" dysfunction may occasionally combine with "hypotonic." The cause of these regulatory fluctuations must be sought in the functional unity of the hypophysis (anterior lobe) and the adrenal cortices. However, the dysfunction of the "central intercalary areas" may be involved rather than the varying degree of excitability in the peripheral pressoreceptor system. Hypodynamic regulatory disturbances were found to yield to long continued treatment with adrenal cortex extract and no longer manifested low pressure as before treatment when put to the test of the physical exertions already mentioned. The author stresses the significance of the circulatory conditions in insulin shock. Insulin intravenously administered precipitated rise of blood pressure of patients with normal tone in the second phase of insulin intoxication and is usually coincident with the lowest level of the blood sugar curve. In persons with Addison's disease not under therapeutic supervision sudden rise of blood pressure was not observed. According to the author, a further circulatory symptom of adrenal insufficiency is the almost regular absence of the otherwise demonstrable pressure increase after administration of epinephrine. This dysfunction, however, is susceptible of correction by adrenal cortex extract or hydrochlorate cysteine therapy.

Khirurgiya, Moscow

1-132 (No. 4) 1939. Partial Index

- Hemotherapy in Practice. Kh. Kh. Vlados and M. S. Dulstsin.—p. 5.
Mitogenetic Irradiation of Blood of Patients with Gastric Cancer. V. P. Nagoryanskaya.—p. 11.
Indications for Treatment of Military Gunshot Skull Injuries. I. P. Dmitriev.—p. 15.
Incidence of Esophageal and Gastric Cancer. L. M. Nisnevich.—p. 27.
Surgical Treatment of Cancer of the Cardia. A. I. Savitskiy.—p. 33.
Intestinal Strangulation in Mesenteric Slits. A. B. Frenkel.—p. 59.
*Removal of an Entire Liver Lobe for Alveolar Echinococcus. I. V. Danilov.—p. 63.

Removal of Liver Lobe for Alveolar Echinococcus.—

According to Danilov the alveolar echinococcus of the liver bears a certain resemblance to a malignant growth because of its infiltrating character, its iron hard consistency, adhesions to neighboring organs, formation of metastases in the brain, pleura, lungs, endocardium and the lymph nodes of the liver hilus, and its tendency to recurrence after radical removal. The alveolar echinococcus develops slowly and as a rule is diagnosed late. The average duration of life of a patient with this condition is about eight years. There were admitted in the last two years to the Bashkir Medical Institute fifty-seven cases of echinococcus of the liver, twenty-five of which were of the alveolar or multilocular variety. In two of these operation was refused and in sixteen the intervention was limited to exploration, while in seven a radical removal was performed. In one case the author removed the entire left lobe of the liver, the seat of a large echinococcus cyst, together with a growth invading the right lobe. There was considerable traumatism and loss of blood leading to shock, requiring two blood transfusions to combat the shock. The patient recovered.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 1601-1664 (June 27) 1939

- Experimental Infection of White Mice with Cholera. R. M. R. Koesoemadilaga.—p. 1602.
Cauterization of Adhesions in Pleural Cavity. W. M. Pruys.—p. 1623.
*Allergic Etiology of So-Called Catarrhal Icterus. D. Brouwer.—p. 1636.
Hereditary Palmar Plantar Keratoma: Case. R. Goenawan.—p. 1647.

Allergic Etiology of Catarrhal Icterus.—Brouwer discusses the connection between "serous inflammation" and disease of the liver. He says that Eppinger regards catarrhal icterus as a serous hepatitis which is closely connected with alimentary intoxication and that Swedish physicians assume that it is an infectious disease. This infectious theory is corroborated by the occasional epidemic appearance which the author was able to observe in Batavia. However, the demonstration of a specific causal factor has not been successful as yet and recently an allergic etiology has been considered. The author describes two cases of catarrhal icterus in which the prodromal symptoms were of the allergic type; in one case the catarrhal icterus was preceded by the cutaneous rheumatismal syndrome and in the other case by severe attacks of migraine. He thinks that the eosinophilia which existed in both cases indicates the allergic character and that the migraine as well as the urticaria and articular disturbances can be regarded as equivalents of gastro-enteritis. They indicate humoral disturbances of the type existing in serum disease which first involve the skin, the joints and nervous system and which secondarily involve the liver. The author cites several other investigators who suggested a connection between anaphylaxis and icterus.

Maandschrift voor Kindergeneeskunde, Leyden

8: 379-426 (July) 1939

- *Postvaccinal Encephalomyelitis. B. Brouwer.—p. 379.
Epidemiology of Scarlet Fever. Helene M. Brouwer-Fronmann.—p. 393.
Albers-Schönberg Disease in a Newborn Infant. N. I. Heybroek.—p. 416.

Postvaccinal Encephalomyelitis.—Brouwer demonstrates that the incidence of postvaccinal encephalomyelitis is decreasing in the Netherlands because the frequency of vaccination has decreased. In 1938 three cases of encephalomyelitis were accepted by the Governmental Committee for Encephalitis as postvaccinal in origin. Two of these were studied microscopically. Typical areas of demyelination with perivascular increase of microglia cells were found scattered through the entire central nervous system. These histologic changes are a constant manifestation in the postvaccinal form of encephalomyelitis but they do not exclude other forms of encephalitis, because they can be found also in other postinfectious encephalitides. The author emphasizes that the formerly widely accepted belief that patients with postvaccinal encephalitis either succumb or recover without residual defects is not correct in that cases have been observed in which tetraplegia or other forms of invalidism persisted many years later. As regards the pathogenesis, the author does not accept the theory of activation of a virus already present in the central nervous system before vaccination. He believes that the encephalitis is caused by the vaccinia virus itself but that an endogenous factor is to be considered.

Acta Pædiatrica, Stockholm

23: 405-574 (June 30) 1939

- Vitamin D and Bone Formation in Rats. R. Nicolaysen and J. Jansen.—p. 405.
Mental Development in Congenital Myxedema. L. F. Schaeffer.—p. 434.
*Pulmonary Tuberculosis in Children with Special View to Prognosis. S. Holm.—p. 455.
Pathogenic Mechanism of Early Acquired Hydrocephalus. O. Elo and E. Otila.—p. 503.
Congenital Anodontia with Abnormalities of the Dermal System. R. Rinvik and A. Syrrist.—p. 548.

Prognosis of Pulmonary Tuberculosis in Children.—Holm reports a study of the prognosis of active pulmonary tuberculosis in children. Of 267 children, fifty-one died. In forty-six of these tuberculous meningitis or miliary tuberculosis was the direct cause of death; the other five died as the result of the pulmonary process. In forty-eight of the fifty-one fatal

cases, death resulted within one year after the admission to the hospital. Thus it seems that, if the children outlive the first year of illness, they have a good chance of surviving. The prognosis differs greatly in the various age groups. Of fifty-five children under 1 year, twenty-four died; of fifty-six children aged from 1 to 2 years, fourteen died; of forty-one children aged from 2 to 3 years, five died; of eighty-five children aged from 3 to 7 years, seven died, and of thirty children aged from 7 to 14 years, one died. On reexamination of 216 survivors, only nine were found who were still ill. This indicates that if the children survive the first year of illness they stand a good chance of recovering completely. As roentgenography is considered the most important method of examination, particular efforts were made to elucidate what prognostic conclusions may be drawn from the roentgenogram at the onset of treatment. Tables indicate that the extension of the tuberculous processes in the lungs is decisive in the prognosis, while the location of the processes has no demonstrable significance. Nineteen patients had miliary dissemination in both lungs; seventeen of these patients died while two recovered completely. Thus cases of this form of tuberculosis are not to be considered altogether hopeless. Exudative pleurisy was found in fifteen children; none of them died. All children were tuberculin positive. The sedimentation test proved to be of but slight prognostic value. Auscultation and the subjective symptoms provided no information that was of prognostic value. *Extrapulmonary complications were rare and they appear not to aggravate the prognosis. In 167 cases it was possible to establish the source of infection, and it was intrafamilial in 120 of these cases. For children over the age of 1 year the prognosis appears not to be less favorable in those cases in which the source of infection is known or even intrafamilial.

Nordisk Medicin, Helsingfors

2: 1723-1802 (June 10) 1939. Partial Index

Finska Läkaresällskapets Handlingar

*New Experiences with Hemorrhagic Diatheses. E. A. von Willebrand and J. Olin.—p. 1743.

Three Cases of Transitory Myopia. R. Mattsson.—p. 1751.

Principles for Determination of Hemeralopia as Symptom of Vitamin A Deficiency. C. E. Nylund.—p. 1754.

Hemorrhagic Diatheses.—Von Willebrand and Olin state that in true hemorrhagic diathesis the hemorrhages are the expression of injuries which affect the whole organism or a certain organ in its entire extent and that they seem to occur spontaneously or after insignificant traumas without establishable more marked exogenic injuries. Etiologically the following types are distinguished: avitaminosis, hemorrhagic diathesis in general, disturbances in nutrition, hereditary types, infectious types, toxic types and hemorrhagic diathesis in diseases of the blood. In the origin of hemorrhagic diathesis a number of different factors are important, namely the blood chemistry, the form elements, especially the thrombocytes, together with the mechanism of bleeding and arrest of bleeding of the vascular walls. In the group of pseudohemophilic disorders four different types have been differentiated: hereditary hemorrhagic thrombasthenia (Glanzmann), constitutional thrombopathy (von Willebrand-Jürgens), the Naegeli type (Switzerland) and the Jürgens type (central Germany). These four types are united in a group termed hereditary thrombopathies. Common to the group are heredity, dominant transmission and deficiency of the thrombocytes together with the vascular weakness found in all hemorrhagic diatheses. To aid in diagnosis, six different types (Jürgens) may be set up: the avitaminotic, the hemophilic, the thrombopathic, the thrombopenic, the capillary toxic and the hormonal type of hemorrhage.

Norsk Magasin for Lægevidenskapen

2: 1803-1886 (June 17) 1939. Partial Index

*Osteosclerosis in Tuberculous Spondylitis. A. Scheel.—p. 1831.
Thymus Cancer and Aplastic Anemia. R. Opsahl.—p. 1835.

Osteosclerosis in Tuberculous Spondylitis.—To make clear the relation between the development of osteosclerosis and destructive changes in the course of tuberculous spondylitis,

Scheel studied seventy-seven cases of certain tuberculous spondylitis. In all the active cases the roentgenograms showed sclerotic changes; furthermore, the sclerosis was most marked in the recent forms and was least marked in those of older date. In increasing sclerosis there were simultaneous signs of activity in the form of increased destruction, while in decreasing sclerosis activity could not be established. The author says that according to his results sclerosis, far from being a sign of healing, points to activity.

2: 1887-1962 (June 24) 1939. Partial Index

Hygiea

*Serologic Studies in Acute Pneumonia. G. Löfström.—p. 1927.

Serologic Studies in Acute Pneumonia.—Löfström says that by the use of mixed vaccines and a slide agglutination method the specific agglutinins against the thirty types of pneumococci can be studied easily. His material comprises eighty-seven cases (thirteen serum-treated cases of lobar pneumonia, twenty-eight additional cases of lobar pneumonia, thirty-eight of bronchial pneumonia, seven of acute infections of the upper respiratory passages and one case of acute tuberculous pneumonia). In eighty-two cases pneumococci were established and type determined and in fourteen cases streptococci were demonstrated, which in eleven cases occurred together with pneumococci. In two cases examination of the sputum was bacteriologically negative. In forty-two of the seventy-four non-serum treated cases agglutinins appeared, occurring with great regularity in lobar pneumonia and with less regularity in bronchopneumonia and infections of the upper respiratory passages. In about two thirds of the cases only one type of pneumococcus was found, and homologous agglutinins developed in the majority of these. Agglutinins not corresponding to the pneumococci occurred in four cases. In about one third of the material more than one pneumococcus type was present. In all these cases there were agglutinins against only one type. In three cases there were specific agglutinins without any established pneumococci. Specific agglutinins against pneumococci are not found in the population in general. During a barracks epidemic agglutinins were established in nine of twenty-three carriers (Gard and Löfström). In acute pneumonia, agglutinins develop between the fifth and the twelfth day. In five of the six fatal cases, agglutinins did not develop. In cases treated with sulfapyridine, agglutinins developed as in untreated cases. In the thirteen cases of pneumonia in which serum treatment was given, the highest titer was usually established on the day after the treatment; in the ten cases treated during the first days of the disease the titer rapidly diminished and disappeared. In the nine bacillary carriers with positive agglutinins and in five of the seven type I pneumonias and one of two type II pneumonias, agglutinins were still present after from three to four months. Under certain conditions antibodies occur in the blood serum which cause swelling of the capsules of types XXVII and XXVIII, sometimes also of types IX, X, XVI, XVII, XVIII, XXI and XXIII. They are best studied by the use of a dilution of the vaccines about twenty times greater than in the regular slide method. Agglutination occurs when the swelling is most pronounced. Unspecific capsule swelling seems to occur regularly in pneumonias, less regularly in infections of the upper respiratory passages. The reaction was not positive in 120 healthy young recruits. During an epidemic of acute respiratory infection the reaction became positive in about one third of 157 soldiers. Complications developed chiefly in the cases with positive capsule swelling reaction. In the group with fever above 39 C. (102.2 F.) complications occurred twelve times in the 36 per cent with positive reaction as against once in the 64 per cent with negative reaction. In eighteen cases of lobar and bronchial pneumonia the reaction was positive in the first blood specimen, that is on the first to the seventh day of the infection. In the twelve cases in which the course was uneventful the reaction became negative between the sixth and the twelfth day; in the other cases, in which the reaction remained positive, pleuritic exudate and serum sickness developed and four of the cases were fatal. The reaction does not seem to be identical with the intracutaneous test of Abernethy and Francis.

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THE POSTOPERATIVE CARE OF THE URINARY BLADDER

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Every one with any surgical experience will agree that difficulties in voiding play a major role in postoperative discomfort. The closer the field of operation approaches the bladder region, the greater the difficulty in voiding spontaneously and the greater the discomfort from overdistention. Hence, the postoperative care of the bladder concerns the gynecologist more than any other surgeon. In recounting their hospital experiences, patients frequently mention the discomfort from overdistention or from catheterization among their most unpleasant memories. There is, however, an even more important reason than the patient's comfort for the proper handling of the bladder after operation. Many chronic and serious urinary tract lesions have their origin in mismanagement of the bladder at this time. In our experience in female urologic conditions we have been struck with the frequency with which patients date their illnesses from trouble in emptying the bladder after operation.

In 1925 a routine was established in the gynecologic service of the Johns Hopkins Hospital which had for its purposes the promoting of postoperative voiding and minimizing the use of the catheter. The procedure consists of the instillation into the bladder of 1 ounce (30 cc.) of 0.5 per cent aqueous solution of mercurochrome at the conclusion of the operation, while the patient is still on the operating table. Here sterile technic should be at its best as well as easiest. At the same time the patient is given rectally 1 liter of 2 per cent sodium bicarbonate solution containing 60 cc. of liquid petrolatum. This rectal instillation of fluids was borrowed from the clinic of the late John G. Clark of Philadelphia. It has for its purpose the insurance of a good alkaline fluid intake during the early postoperative period and the softening of the fecal material in the lower part of the bowel, which it is hoped will facilitate early defecation. It was also thought that an adequate early fluid intake would give the bladder "something to work on" in its early attempts at emptying itself. Whether the giving of this fluid by rectum has any beneficial effect in bringing about early micturition will be discussed later in considering the results of our experience. The originator of the idea that a

bladder instillation of mercurochrome might facilitate postoperative voiding is not known to us.

The favorable results of our early experiences were reported by Craig¹ in a western journal in 1930. As a result of this there has been an adoption of the procedure in some clinics on the West Coast, but generally it is little used. Our results over a long period have been so satisfactory in cases of pelvic laparotomy that we believe they should be brought to the attention of the general profession.

In 1914 Taussig² concluded from his study that the danger of infection from catheterization lay less in the technic than in urinary stagnation. Curtis³ has repeatedly emphasized that simple catheterization at times other than in the postoperative period is relatively harmless. Our experience confirms the views of both of these men. In our outpatient department and in private practice we pass catheters several times a day to obtain urine for diagnostic reasons. We have never had any reason to believe that this procedure has been responsible for a urinary tract infection. Our technic in the outpatient department is simply to swab the urethral meatus with two successive toothpick swabs dipped in 5 per cent mercurochrome. Because of the undesirable staining qualities of mercurochrome, we have substituted an aqueous solution of 1:1,000 merthiolate in the office with equally satisfactory results. With this technic the bacterial flora about the meatus is reduced, but we do not claim for it complete sterilization of the meatus and certainly not of the outer urethra. Undoubtedly some bacteria are introduced into the bladder, but in spite of this we have never seen cystitis occur. The ability of the patient to empty her bladder completely at subsequent voidings apparently prevents the development of cystitis. In dealing with the bladder postoperatively, one is confronted with the additional factor of residual urine. That there is practically always residual urine postoperatively, even when the patient voids from the beginning, has been well demonstrated by Taussig.² He compared the total amount of urine voided in a given time in a group of thirty who voided spontaneously with the total amount obtained by catheter in a group of thirty over an equal period. An average of 5 ounces (150 cc.) more of urine was obtained by catheter from each patient. That there is residual urine for a time in those patients who have required one or more catheterizations has been demonstrated innumerable times by all who practice catheteri-

1. Craig, Robert G.: Bladder Care After Abdominal Operations, *California & West. Med.* 32:162 (March) 1930.

2. Taussig, Fred J.: Bladder Function After Confinement and After Gynecological Operations, *Tr. Am. Gynec. Soc.* 40:351, 1915.

3. Curtis, Arthur H.: The Bladder of Women After Operation: A Consideration of Postoperative Bladder Disturbances, with Special Regard to Treatment, Based on a Study of This Subject in the Care of 465 Cases Operated Within the Last Eighteen Months, *Am. J. Obst.* 78:230 (Aug.) 1918; Residual Urine in Women, *Surg., Gynec. & Obst.* 50:689 (May) 1925; A Study of Bladder Function, *ibid.* 29:24 (July) 1919.

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zation for residual urine after the resumption of micturition. Once one has catheterized a patient postoperatively and presumably introduced a few bacteria, it becomes important to prevent stasis of residual urine on resumption of voiding. We watch the patient carefully after catheterization; if the frequent voiding of small amounts or quickly recurring bladder discomfort after voiding of even larger amounts suggests residual urine we catheterize at least once daily until the residue is reduced to 50 cc. or less. Our experience in reducing the incidence of urinary tract infections by this routine has convinced us of its importance. However, all students of this subject admit the desirability of doing away with the catheter entirely if possible. Any procedure which makes a real advancement toward this end is worthy of consideration.

Most reports on methods of promoting voiding are concerned with inducing the bladder to empty itself after postoperative retention has occurred. The usual procedures of running water, putting warm water in the bedpan, giving enemas, irrigating the perineum and elevating the patient to a partial sitting position are known to all surgical nurses and physicians. They undoubtedly are of value, especially in those cases in which the psyche plays a large role. Drugs have been used extensively. Several years ago some rather enthusiastic reports appeared on the use of solution of posterior pituitary, but subsequent experience has proved disappointing. The parasympathetic stimulators doryl (carbaminocholine chloride) and mecholyl (acetyl-beta-methylcholine chloride) have been used widely with some success. Doryl was first used clinically by Schulze,⁴ who noted success in 80 per cent of a large series of patients with urinary retention after childbirth and gynecologic operations. Subsequently the drug has been used in England⁵ and in this country with considerable success. Constitutional disturbances such as sweating, fainting, salivation, vomiting and a drop in blood pressure are noted in about one third of the cases. The writers on the subject do not consider these symptoms alarming. In our clinic we have had a limited experience with mecholyl administered by mouth in a dose of 25 mg. and we have had some success. We have seen no serious constitutional effects. Administered hypodermically, however, we feel that it is dangerous and the alarming constitutional effects far outweigh the beneficial effects in promoting voiding. In two instances we have been greatly alarmed by the sudden onset of profuse sweating, salivation, fainting, involuntary urination and defecation and a marked drop in blood pressure. In another institution in this city the hypodermic administration of 25 mg. of mecholyl resulted in death before the antidote of atropine could be administered.

The injection of irritants into the full bladder has been used to induce voiding. Baisch⁶ advised the injection of 20 cc. of 2 per cent boroglycerin solution into the full bladder, but Taussig² thought that this was responsible for cystitis in certain cases. Taussig² noted on doing air cystoscopy the not infrequent tendency of the bladder to contract as the air rushed in. He therefore tried the injection of several ounces of air into the full bladder as a mild vesical irritant and reported success in nine of eleven cases.

The method under discussion in this paper approaches the problem from a different angle. Our procedure is an attempt not to empty the distended bladder but rather to prevent distention by inducing the patient to void early.

In our series there were 500 pelvic laparotomy patients who were given the mercurochrome bladder instillation and the fluid by rectum in the operating room. Six and six-tenths per cent of these patients required one or more catheterizations. In a control series of 257 patients with pelvic laparotomies, done at another hospital, 51 per cent required catheterization. In this institution the routine postoperative order was for eight hour catheterization if necessary, whereas in our group the order was for catheterization twelve hours after the operation, if necessary, and after this every eight hours. This difference in orders, however, affected the time of first catheterization very little, for in the control group the average time after operation at which the first catheterization was done was ten hours and twenty-four minutes, whereas in our group it was ten hours and fifty-three minutes. The percentage of catheterizations in the control group is considerably higher than in many series reported in the literature, but both of our groups represent, for the most part, extensive pelvic laparotomies. The conclusion seems to be justified that catheterization has been reduced in our series to almost one eighth by this simple procedure.

We attempted to determine what effect the administration of fluid by rectum had on postoperative voiding. We were able to collect records on only fifty-four cases of laparotomy in which the bladder instillation was given but the fluid by rectum omitted. Five and six-tenths per cent of the patients required catheterization. Although this series is small we believe that it indicates that the essential part of our procedure is the bladder instillation; although we feel that the fluid by rectum is desirable for other reasons, we do not believe that it facilitates voiding.

The time and amount of first voiding in our laparotomies are interesting and instructive. For 551 laparotomy patients who received our routine treatment, the average time of the first voiding was five hours and thirty minutes. For the control series of 132 patients, who did not receive this postoperative treatment, the average time of first voiding was nine hours and twenty-six minutes. For a series of 495 patients receiving routine treatment, the average amount of the first voiding was 194 cc. whereas for a control series of 125 patients, who voided without catheterization and without treatment, the average amount was 168 cc. These data seem to show that by means of this routine the patients more completely emptied their bladders, for in five and one-half hours more urine was obtained than was voided in almost double the time by a control series. Considering the importance of complete emptying of the bladder in relation to the prevention of urinary infection, we believe that this accomplishment is a strong point in favor of our procedure.

The mode of action of the mercurochrome in promoting voiding has interested us; we believe it is due to a temporary chemical irritation of the bladder. Occasionally a little microscopic blood can be noted in the first specimen, but in only one case in our series was there gross hematuria. Often the patient calls for the bedpan as she is arousing from the anesthetic and complains of a marked desire to void before sufficient time has elapsed after operation to allow an appreciable amount of urine to collect in the bladder. The bladder

4. Schulze, Eberh.: *Z. u. N. u. d. Harnverhaltung im Wochenbett und nach* (1933), München, med. Wchnschr. 82:1358.

5. Maxwell, J. S.: *The Treatment of Postoperative Retention of Urine with Doryl*, *Lancet* 1:263 (Jan. 30) 1937. Moir, Chassar: *The Use of Doryl in Postoperative and Postpartum Retention of Urine*, *ibid.* 1:261 (Jan. 30) 1937.

6. Baisch, cited by Taussig.²

irritation usually disappears in twenty-four hours. Although the average first voiding is 194 cc., the amounts of subsequent voidings rapidly increase and we believe it is a reasonable assumption that complete emptying of the bladder is soon obtained.

The influence of the duration of the anesthetic confirms an impression which, we are sure, has been noted by most surgeons. We arbitrarily divided our laparotomy patients into two groups. In the first group, containing 227, the duration of anesthesia was less than one and one-half hours; 4.4 per cent of these required catheterization. In the second group, of 272, the duration of anesthesia was more than one and one-half hours and 7.4 per cent required catheterization. We were also interested in noting the effect on voiding of avertin with amylene hydrate as a basal anesthetic. In 280 cases in which this was used, supplemented by ether, 8.2 per cent of the patients required catheterization. In 217 cases gas, oxygen and ether were used and only 3.7 per cent required catheterization. It seems reasonable to suppose that the latter group recover more quickly from the anesthetic and hence are more acutely sensitive to the impulse to void. On the other hand, the avertin group are lethargic for most of the day of operation and hence less aware of their full bladders, which therefore require catheterization in a larger percentage of cases.

Although the postoperative comfort of the patient is of great importance to her, the avoidance of a persistent urinary tract infection is even more essential in the long run. We therefore made a study of our cases from that point of view. We sought to determine how many of our patients had evidence of cystitis on discharge from the hospital. In only one of the 500 cases was a bladder symptom present on discharge, and this consisted of only slight frequency but no burning. It was noted in the patient's history that she had had an attack of frequency and burning several years prior to admission, but her urine on admission was normal microscopically. Despite the symptoms just noted, the urine culture was negative on discharge.

Among the 500 patients who received our treatment, two developed pyelitis postoperatively, but in both cases there was a history of previous urinary tract infection. A short summary of these two cases follows:

CASE 1.—The patient complained of nocturia, having voided three to four times per night for two years, and of dysuria for three months before admission. The urine, however, was clear microscopically on admission, but no culture was made. On the third postoperative day the patient had a temperature of 103.2 F. and on the fourth day *Bacillus coli* was cultured from the bladder urine, which contained many white blood cells. On the fifteenth postoperative day the urine culture again showed *B. coli* but the patient had no symptoms. She was discharged on the twentieth postoperative day, still with a low grade fever. Twenty days later she returned to the hospital with typical acute pyelitis. She was treated with sulfanilamide and the urine became sterile. On discharge, after ten days of therapy, the patient was symptom free.

CASE 2.—On admission the patient gave a history of nocturia, voiding twice a night, and catheterized urine showed occasional dumps of white blood cells. The postoperative course was not remarkable and she had been allowed to walk. On the twentieth day she had a chill and a temperature of 104 F. The urine was loaded with white cells, and *B. coli* was cultured. The temperature became normal on the twenty-eighth day but the culture was still positive. Subsequent follow-up study in the dispensary revealed no residual urinary disturbance.

Here, then, are two cases of postoperative pyelitis and one of mild bladder symptoms in our series of 500

cases, but all three patients had histories of previous urinary tract infection. Let us compare these results with those of our control series of 249 laparotomy patients from another hospital. The postoperative history notes were less complete than in our series, so details such as notes on cultures and catheterized specimens were often lacking. However, in this group there were five cases of clinical cystitis and two of pyelitis. In none of these was there any evidence of preexisting urinary tract infection, but as before mentioned the histories were not as complete as those in our own series. Comparing these results with those of our own, we believe that we are justified in concluding that urinary tract infections are less frequent in patients treated according to our routine. In fact there was no postoperative infection in any patient who did not have a previous history of infection.

Our results with this procedure after the vaginal plastic operations were less successful. In fact our study shows that the procedure is of no value in promoting voiding after extensive vaginal operations. In our series of fifty-nine vaginal plastic cases, which includes twenty-five interposition operations, 58 per cent of the patients required catheterization. In our control series, in which patients did not receive our treatment, there were sixty-two cases, including twenty-eight interposition operations. Exactly the same percentage (58) of the patients required catheterization. Our clinical impression has been that the Watkins interposition operation offers the greatest difficulty with postoperative voiding. Our statistics bear out this impression, for after a total of fifty-three interposition operations in both series 72 per cent of the patients required catheterization.

Since there is nothing in our statistics to indicate that our procedure is of any value in promoting voiding after extensive vaginal plastic operations, we have returned to the use of an indwelling male catheter for the first week. Certainly with the interposition operation this is the logical procedure, as only 28 per cent of the patients voided spontaneously. There is little doubt that infection travels into the bladder via the indwelling catheter, but this is apparently of little significance since few of these patients have bladder symptoms following removal of the catheter. When it is removed at the end of a week the bladder has generally so regained its tone that spontaneous and complete micturition follows. If there is any indication of residual urine the patient should be catheterized until it has been proved that such a residue no longer exists.

The importance of avoiding overdistention of the bladder was well illustrated in one of our interposition cases. The patient began to void spontaneously postoperatively but voided frequently and in small amounts without relief. She was finally catheterized on the third day, and 700 cc. of urine was obtained. In the next twenty-four hours she was catheterized for great distress three times, and 800 cc., 700 cc. and 450 cc. of urine were obtained successively. On the fourth postoperative day her temperature rose to 103 F. and she had costovertebral tenderness on the right. On the fifth day an indwelling catheter was inserted, and the temperature became normal in twenty-four hours. This case also indicates that a routine order for catheterization every eight hours if the patient voids less than 100 cc. at one time is not entirely satisfactory. This patient voided as much as 200 cc. at a time but apparently only as an overflow. She should have been catheterized for bladder distress long before her bladder

became so distended, but the nurse, adhering literally to the 100 cc. rule, failed to pay proper attention to the patient's distress. With such severe bladder discomfort the nurse should have called the intern, who undoubtedly would have ordered catheterization earlier.

SUMMARY

A special technic to promote postoperative voiding consists of instilling into the bladder 1 ounce of 0.5 per cent aqueous solution of mercurochrome in the operating room. The results after pelvic laparotomies have been very gratifying, the incidence of catheterization having been reduced from 51 per cent in a control series to 6.5 per cent in a series of 500 cases in which this procedure was used. An instillation of a liter of fluid by rectum at the same time was found to be of no value in reducing the incidence of catheterization. Evidence has been presented to show that the patients in whom the instillation was used voided earlier and in greater amounts, thus more completely emptying the bladder than the patients in the control series. It has been shown that the shorter the anesthesia the greater the likelihood of spontaneous postoperative micturition. The patients receiving a basal anesthesia of avertin with amylene hydrate required catheterization in 8.2 per cent while those given straight gas, oxygen and ether required catheterization in only 3.7 per cent. Postoperative urinary tract infection, as judged by symptoms of cystitis on discharge and pyelitis, did not occur after any of the 500 laparotomies in which the procedure was carried out, with the exception of three cases. In each of these there was a definite history of urinary tract infection preoperatively. The procedure has been shown to be of no value in case of extensive plastic operation, in which an indwelling male catheter is considered the most satisfactory procedure.

ABSTRACT OF DISCUSSION

DR. GEORGE H. GARDNER, Chicago: An ideal method of managing the bladder after gynecologic operations should be equally effective after all types of operations, cause the patient a minimum of discomfort, safeguard the integrity of sutures that have been placed near the bladder, and finally not only eliminate acute complications of the upper urinary tract from postoperative problems but also obviate chronic conditions in the lower urinary tract as permanent sequelae of gynecologic surgery. The technic which Dr. Arthur H. Curtis described and which has been the routine in our service at Passavant Memorial Hospital for ten years is a close approach to the ideal. Our patients are subjected to intermittent catheterization; they do not have indwelling catheters. They are catheterized for distress, not after any specified number of hours, but for any marked discomfort which may be ascribable to a distended bladder. We endeavor to avoid overdistention and consider the accumulation of more than 350 cc. of urine as being potentially harmful. After a woman has been catheterized two or more times or has worn an indwelling catheter, her bladder is infected. Such an infection rarely attains significant proportions, if the physician and his staff are residual urine conscious. Consequently, after our patients start to void they are catheterized once or twice daily for residual urine until that residual is persistently less than 15 cc. in amount and is grossly clear. I prefer intermittent catheterization with routine check for residual urine, because this method is equally applicable to all patients and we realize that simplicity in hospital routine makes for more efficient care of patients. We do not favor retention catheters, either male or de Pezzer, because they give one a false sense of security; indwelling catheters do not always drain the bladder completely, as they tend to become displaced and plugged. After a retention catheter has been removed it is vital that the patient be checked in a routine way for residual urine.

DR. WILLIAM T. KENNEDY, New York: Nature has to overcome obstacles to restore the bladder to normal following pelvic or vaginal operations. First, some patients come for operation having been below par physically; they have very mild, low grade infections of the upper urinary tract, with some desquamation. This at operation suddenly becomes more active and for the first few postoperative days the sediment in the bladder is increased; this with the associated loss of muscle tone of the bladder permits the accumulation of a precipitate which on standing breaks down into the alkaline ammonia salts to irritate the base of the bladder. Only part of this precipitate passes out when the patient voids. Nature has two resources: one, to increase the flush from the kidneys; the other, to send bacteria in to clean up this mixture of mucus, desquamated cells, and so on. The colon bacilli are those elected. How they get in I do not know, but I doubt that it is through the urethra. Here is our opportunity to help nature. The first catheterization for residual urine is done and it is allowed to stand for a couple of hours for sedimentation. If sediment is present, the bladder is irrigated with boric acid solution and an ounce of 10 per cent solution of caroid or papain instilled into the bladder. This will materially aid in clearing up the base of the bladder. This is repeated daily for three or four times. Instillation of antiseptics at this time would only inhibit nature's bacterial processes. With the recent advent of neoprontosil, I feel that much could be accomplished in preventing this complication by giving the drug three or four days before operation. Second, the next obstacle to overcome is the diminished function of the kidneys. This is best activated by clysis or intravenous saline solution or dextrose, as well as all the fluids which can be tolerated by mouth. Drs. Woodruff and Te Linde found that the rectal instillation had little effect on the bladder. Most fluids are used by the body in counteracting dehydration. The return of the urine flow to normal may roughly be estimated by the excretion of 400, 800, 1,200 and 1,600 cc. on the first four successive days. Third, the next obstacle nature has to overcome is the loss of bladder muscle tone either when the bladder structures have been unmolested or considerably disturbed by operative procedures. Comparing the treated cases with the untreated controls for the time of first voiding and the amount voided, one is amazed that the treated bladder voids more urine than the untreated one and almost twice as soon. The kidneys were either more active or there was less residual urine, and I am forced to believe there was less residual urine. The authors have made definite progress in eliminating this worst offender (residual urine). In the care of the bladder after operation I use an indwelling male catheter for about a week, watch the urine carefully for sediment and, if it appears, irrigate the bladder and instil caroid or papain solution into it. After the catheter has been removed I catheterize the patient twice a day immediately after voiding until the residual urine is one-half ounce or less.

Greater Mortality Among Males.—About one quarter of the known pregnancies result in stillbirths. Great numbers of these aborted babies have been examined, and some surprising data obtained. In embryos aborted when they are about three months old, specialists can already distinguish sex, and in these early mortalities they have found that the males outnumber the females almost four to one. These, however, are but a small percentage of the total stillbirths. In those in the fourth month, aborted males are double those of females, in the fifth month 145 males to 100 females, in the next few months the proportion drops further, but just before birth there is a rise to almost 140 males aborted to every 100 females. All this leads to another conclusion: That before birth, certainly, males as a class are not only not stronger than females but, quite on the contrary, are weaker. If we look beyond birth we find, moreover, that at almost every stage of life, males drop out at a higher rate than females. It may very well be, then, that a canny Nature enters more males than females at the start of life's race in order to counterbalance the difference in mortality.—Scheinfeld, Amram: You and Heredity, New York, Frederick A. Stokes Company, 1939.

PRIMARY PERITONITIS IN INFANTS
AND CHILDREN

A MORE EFFECTIVE TREATMENT

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Primary, idiopathic or metastatic peritonitis has always been associated with a very high mortality rate in infants and children. In recent years, with the use of sulfanilamide and antipneumococcus serum, we have markedly lowered the mortality rate in this disease and have revised our therapeutic approach. It is our purpose in this paper to present an effective treatment of the disease and the information gained from sixty-seven cases of primary peritonitis observed in the ten year period 1929-1939 at the Children's Hospital.

ETIOLOGY

The offending organism in primary peritonitis is usually the pneumococcus or the hemolytic streptococcus. Three patients with primary peritonitis, not included in this series, were encountered in whom no organisms were demonstrable by direct smear or culture of the peritoneal exudate. The streptococcus was found more than twice as frequently as the pneumococcus, since there were forty-seven cases attributable to the former and twenty cases to the latter.

The pathways by which the organism may enter the peritoneal cavity have received detailed consideration in previous reports.¹ The possible modes of entry are by way of (1) the blood stream, (2) the vagina and fallopian tubes in females, (3) the gastrointestinal tract and (4) the transdiaphragmatic lymphatics.

In the present series blood cultures were made on twelve patients with pneumococcic peritonitis, and ten of these were positive. Similar cultures were made on eighteen patients with streptococcic peritonitis, and four were positive. Cultures of material from the vagina were taken of three patients with pneumococcic peritonitis, and one yielded the same type of pneumococcus as that isolated from the peritoneal cavity. Vaginal cultures were taken of six patients in the streptococcus group, and three were positive for hemolytic streptococci. Cultures of material taken from the throat of five patients with pneumococcic peritonitis failed to reveal the offending organism, although in each other types of pneumococci were isolated. In the streptococcus group, four throat cultures were made and two of these were positive for hemolytic streptococci.

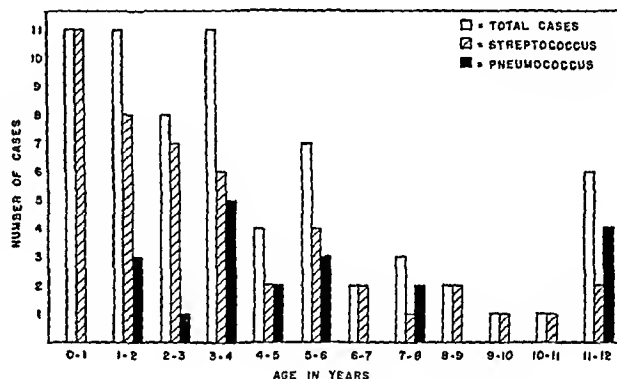
Of the forty-one patients who died, twenty came to autopsy, including eight females. In no instance was there evidence of an ascending infection along the genital tract.² In the absence of more convincing evidence concerning the other possible routes, we feel that the probable mode of entry is by way of the blood stream.

The types of pneumococci isolated in peritonitis have not been noted in the majority of publications on the subject, but those reported show a preponderance of the type I pneumococcus.³ In the present series of cases there were five of type I, four of type VI, two of type V and one each of types IV, VIII, X, XI, XVIII and XXII. No conclusions can be drawn from the available material as to the relation of the type of pneumococcus to the severity of the peritonitis.

AGE AND SEX

The disease is much more common in the first four years of life, as shown in the accompanying chart. Streptococcic peritonitis has its highest incidence during infancy, whereas pneumococcic peritonitis predominates between the ages of 2 and 7 years. The latter observation is in accord with the observations of McCartney and Fraser.¹

There were no appreciable differences in the sexes in the total group or when they were divided into their etiologic groups (table 1). However, it is to be noted that six of the male patients in the pneumococcic group had nephrosis whereas only two females of the same group had nephrosis. Excluding the patients with



Incidence of primary peritonitis according to age.

nephrosis, there would be a definite preponderance of females in the pneumococcic group, an observation that has been emphasized repeatedly.⁴

CLINICAL FEATURES AND DIAGNOSIS

Primary peritonitis was preceded by an infection of the upper respiratory tract, mild or severe, in more than one half of the cases. In several cases there had been a previous otitis media or a cervical adenitis. The onset was acute and was associated with fever, abdominal pain, nausea and vomiting. The abdominal pain may be difficult to localize in infants and children, but in a large number of instances it appeared to be periumbilical. Diarrhea was a common symptom and at times was profuse. The diarrhea, if present, usually appeared in the first thirty-six hours of the disease. Some of the common symptoms and their incidence are listed in table 2.

On physical examination, patients with primary peritonitis appear severely ill and are frequently prostrated. Signs of infection of the upper respiratory tract may be present. The temperature is elevated between 103 and 105 F. and the pulse is correspondingly rapid. The abdomen is diffusely tender throughout and the general-

From the Departments of Surgery and Pediatrics of the Children's Hospital and the Harvard Medical School.
1. McCartney, J. B., and Fraser, J.: Pneumococcus Peritonitis, *Brit. J. Surg.* 9: 479-489 (April) 1932. Obadelek, W.: Die Frühoperation der Pneumokokkenperitonitis im Kindesalter, *Zentralbl. f. Chir.* 58: 1250-1258 (May 16) 1931. Rischbieth, H.: On Pneumococcus Peritonitis, *Quart. J. Med.* 4: 205-231, 1910. Glazier, M. M.; Goldberg, B. L., and Weinstein, A. A.: Primary Pneumococcic Peritonitis: Recovery of the Acute Serous Type Following Type I Serum Treatment Without Surgical Intervention, *Ann. Int. Med.* 10: 1042-1049 (Jan.) 1937.
2. Farber, Sidney: Personal communication to the authors.

3. Leonardo, R. A.: Primary Pneumococcus Peritonitis, *Ann. Surg.* 82: 411-416 (March) 1926. Donovan, E. J.: Surgical Aspects of Primary Pneumococcus Peritonitis, *Am. J. Dis. Child.* 48: 1170-1171 (Nov.) 1934.

ized involuntary spasm may be boardlike. In infants up to 2 years of age, however, the abdomen may be "doughy" rather than spastic to palpation. Abdominal distention of varying degree may be present. Rectal examination reveals diffuse tenderness, although occasionally a pelvic abscess is detected. The remainder of the physical examination is remarkable in that it reveals nothing severe enough to account for the "toxic" picture. The leukocyte count varies between 20,000 and 50,000, with more than 80 per cent polymorphonuclear leukocytes. Urinalysis usually reveals the presence of acetone.

It is impossible to differentiate between streptococcic and pneumococcic peritonitis clinically, but we feel that primary peritonitis can usually be distinguished from

TABLE 1.—Incidence of Primary Peritonitis According to Sex

Primary Peritonitis	Males	Females
All cases.....	33	34
Pneumococcic.....	9	11
Streptococcic.....	24	23

secondary peritonitis. In the present series the correct diagnosis of primary peritonitis was made in 64 per cent of the cases on entry. We do not agree with the statement of Leopold and Kaufman⁴ that "a definite clinical diagnosis of peritonitis cannot be made without operation or abdominal tap."

The condition most likely to be confused in diagnosis is acute perforated appendicitis with generalized peritonitis. However, in primary peritonitis there often has been a preceding infection of the upper respiratory tract. The age is important, as appendicitis is infrequent in the first two years of life. The patient is sicker from the onset, which may be initiated by a chill, and diarrhea is more likely to be associated with primary peritonitis than with appendicitis. Furthermore, the abdominal signs are more generalized and the fever is higher. The leukocyte count is usually higher than in peritonitis of appendical origin. It is obvious that in some instances the diagnosis between primary and secondary peritonitis will not be clear until the character of the peritoneal exudate is studied.

TREATMENT

As soon as the clinical diagnosis of primary peritonitis is made, the organism responsible must be recovered in the quickest possible manner in order that specific therapy can be instituted. Our method of choice for recovering the organism is operative. The patient is given parenteral fluids if indicated and then taken to the operating room, where under local or cyclopropane anesthesia a 1 inch muscle-splitting incision is made in the right lower quadrant. The peritoneum is merely nicked, and sufficient exudate for smear and culture is obtained by swab or gentle aspiration through a rubber catheter. A Penrose drain is inserted and the wound is closed to the drain with two or three sutures. It is important to point out that no exploration is performed and that the purpose of the procedure is to recover peritoneal exudate and incidentally to insert a drain. The advantages of this method for recovering the organism are that: 1. It is a minor operation and can be performed under local anesthesia in infants and very

sick patients. 2. The results are never equivocal. 3. Drainage is established, which we feel is of considerable value, although we realize that it is impossible to drain the entire peritoneal cavity. 4. The procedure is not shocking and does not upset the patient. 5. If the peritonitis is due to appendicitis, the incision is easily enlarged for an appendectomy. Abdominal paracentesis has been advocated⁵ as the procedure of choice for recovering organisms from the peritoneal cavity. We do not recommend it because, (1) if the results are negative, primary peritonitis has not been ruled out; (2) if the peritonitis is of appendical origin, appendectomy cannot be performed, and (3) the needle may enter a loop of bowel, which may do no harm but is undesirable.

The gross appearance of the peritoneal exudate is important. In pneumococcic peritonitis the exudate is odorless, fibrinous and soapy, while in streptococcic peritonitis it is odorless and thin and contains small flecks of fibrin. As soon as the exudate is obtained it is stained by Gram's method and cultured on blood plates, beef broth and human ascitic fluid. If the pneumococcus is present it will usually grow out in the human ascitic fluid within three hours and then can be typed. The stained smear gives an immediate clue as to the identity of the organism. It is apparent from the foregoing that the specific therapy can be instituted within several hours after the patient enters the hospital. The administration of the specific therapy will be discussed later.

The after-care of the patient is very important. The patient is placed in a high Fowler's position and given morphine sulfate subcutaneously every four hours by the clock for the first thirty-six to forty-eight hours. Hot flaxseed poultices are applied to the abdomen every three hours. The water balance is maintained by intravenous injections of 10 per cent dextrose solution and hypodermoclyses of physiologic solution of sodium chloride. Blood transfusions are liberally employed for anemia or hypoproteinemia. If the patient does not vomit and there is no distention, water and dilute fruit juices are given by mouth several hours after opera-

TABLE 2.—Common Symptoms: Incidence

	Cases
Fever.....	66
Abdominal pain.....	66
Nausea and vomiting.....	51
Preceding respiratory infection.....	42
Diarrhea.....	35
Constipation.....	23
Vaginal discharge (34 females).....	4

tion. Fluid by mouth is increased gradually and a semisolid diet is reached by the third or fourth postoperative day. If there is vomiting or distention, constant gastric siphonage is employed. We have found the high concentration of oxygen as advocated by Fine and his associates⁶ to be a valuable addition to the treatment of distention in patients with primary peritonitis. The wound is dressed frequently enough to keep it dry. The sutures are removed from the wound on the seventh postoperative day, and the abdominal

4. Leopold, J. S., and Kaufman, R. E.: Acute Primary Streptococcus Peritonitis, *J. Ped.* 10: 45-65 (Jan.) 1937. McCartney and Fraser.¹ Glazier, Goldberg and Weinstein.¹

5. Neuhoﬀ, H., and Cohen, J.: Abdominal Puncture in the Diagnosis of Acute Intraperitoneal Disease, *Ann. Surg.* 83: 454-462 (April) 1926. Cole, W. E.: Pneumococcus Peritonitis, *Surgery* 1: 386-394 (March) 1937. Leopold and Kaufman.⁴

6. Fine, J.; Hermanson, L., and Fréhling, S.: Further Clinical Experiences with 95 per Cent Oxygen for Absorption of Air from Body Tissues, *Ann. Surg.* 107: 1-13 (Jan.) 1938.

drain is removed between the seventh and tenth post-operative days. It is of interest that only two patients in this series required an enterostomy for intestinal obstruction following primary peritonitis.

SPECIFIC THERAPY IN STREPTOCOCCIC PERITONITIS

The dosage and method of administering sulfanilamide in use at the Children's Hospital have been reported previously by Carey.⁷ In primary peritonitis, treatment with sulfanilamide may be instituted as soon as the patient has returned to the ward from the operating room, even before the results of the peritoneal culture are known. If a pneumococcus is isolated, sulfapyridine may be substituted and continued in conjunction with specific serum therapy. The initial dose of sulfanilamide may be given by hypodermoclysis of an 0.8 per cent solution in physiologic solution of sodium

to have symptoms of acute appendicitis and an exploration was performed immediately. Operation revealed the true nature of the disease and pathologic examination of the appendix showed only periappendicitis. In all cases the bacteriologic diagnosis was established by cultures of the peritoneal cavity obtained at operation. Early operation was performed in all but two of the cases (cases 2 and 3). In case 3 the operation was deferred four days, and not until then was specific treatment started. Recovery followed a prolonged and stormy course. In case 2, in which the illness terminated fatally, incision of the abdomen was deferred for about eighteen hours. None of the patients with streptococcic infection who recovered had positive blood cultures, although all of them were critically ill.

The first two patients (1 and 2) who were treated with sulfanilamide received very small amounts of the drug and died. The other five patients received doses

TABLE 3.—Patients with Primary Streptococcic Peritonitis Treated with Sulfanilamide

Patient	Month and Year	Age		Sex	Day of Disease On Entry	Organism First Recovered			Operation		Sulfanilamide			Blood Level, Mg. per 100 Cc.	Complications	Results
		Yr.	Mo.			Source	Day of Disease	Bacteremia	Nature	Day of Disease	Dose	Day of Disease				
1	Nov. 1936	1	4	♀	6	Abdomen	6	Yes	Incision and drainage	6	Prontosil 35 cc. of total dose	6	7	None taken	.....	Died
2	March 1937	9		♀	3	Abdomen	4	Yes	Incision and drainage	4	0.025 Gm. per pound	4	11	None taken	.....	Died
3	June 1937	3	9	♂	5	Abdomen	9	No	Incision and drainage	9	0.06 Gm. per pound	9	13	None taken	Fecal fistula; broncho-pneumonia	Recovered
4	Nov. 1937	5	8	♂	3	Abdomen	3	No	Incision and drainage	3	0.1 Gm. per pound 0.06 Gm. per pound	3 4	4 12	None taken	None	Recovered
5	Dec. 1938		9	♂	2	Abdomen	2	No	Incision and drainage	2	0.1 Gm. per pound	2	5	22.0 6.2	None	Recovered
6	Dec. 1938	6	5	♀	1	Abdomen	2	No	Incision and drainage, appendectomy	1	0.06 Gm. per pound	1	2	None taken	None	Recovered
7	Feb. 1939	1	7	♀	2	Abdomen	2	No	Incision and drainage	2	0.06 Gm. per pound 0.03 Gm. per pound	2 10	10 12	14.8 8.3 6.0	14th post-operative day intestinal obstruction, enterostomy	Recovered

chloride and maintained by oral administration of crushed tablets as soon as the patient is able to tolerate fluids by mouth. During the first two or three days of treatment, doses of from 0.1 to 0.15 Gm. per pound of body weight in twenty-four hours will usually be sufficient to establish an optimal blood level of from 10 to 20 mg. per hundred cubic centimeters as estimated according to the method of Marshall.⁸ The dose may be reduced by one half when definite clinical improvement is in evidence and discontinued about one week later, according to the indications in the individual case. In several of the cases reported here, administration was discontinued earlier than would seem advisable.

Seven patients with primary peritonitis due to the hemolytic streptococcus received sulfanilamide (table 3). In six of the cases the diagnosis of primary peritonitis was made at entry. One patient (case 6) was thought

of from 0.06 to 0.1 Gm. per pound for periods which varied from one to twelve days. In most of the cases the blood levels were not recorded, and the drug was administered and discontinued arbitrarily according to the clinical appearance. Satisfactory concentrations of sulfanilamide were obtained in the blood of two patients who responded to treatment by a prompt drop in temperature and early clinical improvement. Patient 6, who made an uneventful recovery, received a dose of 0.06 Gm. per pound for only twenty-four hours, at which time the drug was discontinued because of marked nausea. While under treatment, all the patients appeared cyanotic and in all moderate anemia developed which was treated by blood transfusions.

SPECIFIC THERAPY IN PNEUMOCOCCIC PERITONITIS

Before treatment with specific antipneumococcus serum, precautions are taken in each case to determine the presence or absence of sensitivity. This includes a careful inquiry into the past history for previous injections of serum or manifestations of allergy and the usual intradermal and ophthalmic tests with a 1:10 dilution

7. Carey, B. W., Jr.: The Use of Para-Aminobenzenesulfonamide and Its Derivatives in the Treatment of Infections Due to the Beta Streptococcus Haemolyticus, the Meningococcus, and the Gonococcus, *J. Pediat.* 2: 202-214 (Aug.) 1937.

8. Marshall, E. K., Jr.; Emerson, Kendall, Jr., and Cutting, W. C.: Para-Aminobenzenesulfonamide, *J. A. M. A.* 108: 953-957 (March 20) 1937.

of the animal serum to be used. During the testing and administration of serum, epinephrine solution should always be available for immediate use. Serum treatment is deferred postoperatively until the patient's circulation and general condition are sufficiently restored to minimize the danger of precipitatory collapse.

Serum was given exclusively by the intravenous route. The schedule of administration, gradually formulated, consisted of an initial injection of 1 cc. followed at frequent intervals of at least two hours by larger injections of from 3 to 10 cc. To minimize reactions, slowness of injection was deemed of great importance. This was facilitated by diluting each dose of serum in from 5 to 10 volumes of physiologic solution of sodium chloride. Small quantities were delivered from a standard syringe; large amounts were given as an infusion or injected through the rubber tubing of a constant

showed no growth. The blood stream of one bacteremic patient (5) was temporarily sterilized by the administration of specific antibody but reinvasion occurred and, despite continued treatment, persisted until death. Another patient (8) whose blood culture before operation was positive had a remission of symptoms and negative blood cultures postoperatively, even before specific antipneumococcic treatment was started.

Surgical incision and drainage of the abdomen was performed in seven of the eight cases. In six cases this was carried out at the earliest possible opportunity; that is, on the day of onset or admission to the hospital. Early conservatism in the policy of treating one patient (3) resulted in a considerable, although fortunately not a fatal, delay in operating and establishing the bacteriologic diagnosis. Administration of serum was started in this case prior to surgical drainage on the evidence

TABLE 4.—Patients with Primary Pneumococcic Peritonitis Treated with Serum

Patient	Month and Year	Age		Sex	Day of Disease at Time of Entry	Organism First Recovered			Bacteremia	Operation		Serum Treatment*			Presence of Nephrosis	Complications	Results
		Yr.	Mo.			Type	Source	Day of Disease		Nature	Day of Disease	Total Units	Day of Disease				
1	Nov. 1934	11	6	♀	1	I	Abdomen	2	+	Exploratory laparotomy, appendectomy	1	Horse 170,000	2	4	—	Pneumonia, empyema, serum sickness	Recovered
2	June 1936	7	6	♀	2	I	Blood	5	+	Incision and drainage of abdomen	6	Horse 150,000	5	6	—	Pneumonia, empyema	Recovered
3	May 1937	7	3	♀	1	I	Abdomen	1	—	Incision and drainage of abdomen	1	Horse 150,000	2	4	—	Pneumonia, abscess of abdominal wall, fecal fistula	Recovered
4	Nov. 1937	5	10	♀	4	I	Abdomen	4	—	Incision and drainage of abdomen	4	Horse 150,000	5	6	—	Pneumonia, pelvic abscess	Recovered
5	Aug. 1938	11	9	♂	Onset in hospital	IV	Blood	2	+	None (paracentesis of abdomen)	2	Rabbit 350,000	2	6	+	Intestinal obstruction, renal failure	Died
6	Sept. 1938	3	11	♂	1	VI	Abdomen	1	+	Incision and drainage of abdomen	1	Rabbit 800,000	1	4	+	0	Recovered
7	Nov. 1938		17	♀	5	V	Abdomen	1	+	Incision and drainage of abdomen; appendectomy	5	Rabbit 900,000	5	7	—	Serum sickness	Recovered
8	Feb. 1939	2	7	♀	Onset in hospital	IV	Abdomen	2	+	Incision and drainage of abdomen	1	Rabbit 66,000	2	2	+	0	Recovered

* The rabbit serum used in the last four patients from Lederle's Laboratories.

intravenous drip. When the anticubital veins were inaccessible, 24 gage needles were used and the serum was injected into small veins of the extremities or scalp.

Eight patients with proved pneumococcic peritonitis were treated more or less according to the method advocated (table 4). In every case a clinical diagnosis of primary peritonitis was promptly made from the history and physical examinations, and the bacteriologic diagnosis was established on the basis of cultures obtained from the peritoneal cavity. In six of the eight cases early operation on the day of entry to the hospital facilitated identification of the responsible pneumococcus within a few hours. In two cases (3 and 5) the invading organism was not sought immediately in the peritoneal cavity and was first detected in the blood cultures.

Bacteremia was present prior to specific serum therapy in six of the eight cases. In each instance the organism obtained from the blood stream was identical with that from the peritoneal cavity. In five of the cases all blood cultures taken subsequent to serum treatment

of a positive blood culture. At operation the appendix was removed from two patients (1 and 3) because injection and fibrin deposits on the serosal surface suggested the possibility of primary appendical involvement and the patient's condition warranted this manipulation. Subsequent pathologic examination, however, revealed only periappendicitis. Abdominal paracentesis was substituted for surgical drainage in case 5, nephrosis, in which the illness terminated fatally.

The amount of antibody required appeared to vary with individual cases, and the number reported here are too few to warrant definite conclusions. As the nature of the infection is severe, highly fatal and usually accompanied by bacteremia, serum was administered in large doses during the first twenty-four to forty-eight hours and continued until the blood stream was sterile and definite clinical improvement was in evidence. Immunologic studies were carried out in some of the more recent cases, but the data available do not at present offer a more accurate basis of estimating the antibody requirement. Reactions to serum occurred in

three cases but in no instance proved alarming. Serum sickness appeared during convalescence in two cases.

Because the bacteriostatic action of sulfanilamide against the pneumococcus has been demonstrated in vitro and applied successfully in the treatment of pneumococcic meningitis,⁹ this drug was included in the therapy of three patients (5, 6 and 7), but in only one (case 6) was a satisfactory concentration of this drug in the blood achieved and maintained. Recent reports¹⁰ on the efficacy of sulfapyridine in the treatment of pneumococcic peritonitis encouraged the administration of this drug in case 8. Clinical improvement, however, seemed to occur and the patient became non-bacteremic before the administration of sulfapyridine or serum, so that no definite conclusions can be derived in this case as to the benefit of either.

Complications attributable to the offending pneumococcus occurred in five cases, in three of which bacteremia was proved. In the four cases of type I infection pneumonia developed as a secondary disorder and was followed in two cases by empyema requiring surgical drainage (cases 1 and 3). In one case an abscess of the abdominal wall developed together with a fecal fistula, which healed slowly without surgical intervention. In case 4 a pelvic abscess developed and resolved gradually. In the case of type IV infection, the complications were incident to a fatal termination. The patient was a boy with lipoid nephrosis, whose symptoms were initiated by a chill and a sudden rise in fever while under treatment for nephrosis in this hospital. Type IV pneumococci were identified in a blood culture fourteen hours later. An abdominal paracentesis done at this time yielded the same organism. No operation was performed. Serum was administered in daily doses of 180,000, 80,000, 40,000, 40,000 and 40,000 units, starting on the second day, or about fifteen hours after onset. On the first day of treatment the

of cases is divided into those in which specific therapy was and was not given, there is a striking difference in the mortality rates (table 6). It is at once evident that the total rate has been lowered more than 50 per cent. In the pneumococcic group with early operation and specific therapy there is only 12.5 per cent mortality, in contrast to 83.3 per cent in those without the advocated therapy. On the other hand the streptococcic group

TABLE 6.—Mortality Rates in Pneumococcic and Streptococcic Peritonitis With and Without Specific Therapy

Children's Hospital, Primary Peritonitis 1929-1939	Without Specific Therapy			With Specific Therapy		
	Total Cases	Deaths	Mortality, per Cent	Total Cases	Deaths	Mortality, per Cent
All primary cases...	52	38	73.0	15	3	20.0
Pneumococci.....	12	10	83.3	8	1	12.5
Streptococci.....	40	28	72.0	7	2	28.5

presents a less striking but significant drop in the mortality of 72 per cent to 28.5 per cent in the corresponding groups. As pointed out previously in this paper, the one patient with pneumococcic peritonitis and the two with streptococcic peritonitis who were given specific therapy and died were not given adequate specific treatment.

COMMENT

In the present clinical study of primary peritonitis, the benefits of early operation and adequate specific therapy have been reflected by a significant reduction in the mortality. The details of treatment remain somewhat elastic and, as pointed out elsewhere, not all of the patients were treated according to our present concept of the most effective procedure. The virulence of the organism and the resistance of the patient are two factors in primary peritonitis which always play an important role, which is difficult to evaluate in discussing the results of any type of treatment. Several cases of pneumococcic peritonitis successfully treated with sulfapyridine have been reported¹⁰ recently. This may prove a valuable adjunct to the serum therapy of the disease.

The present program of treatment of primary peritonitis that we advocate following is as follows:

1. Early incision and drainage of the peritoneal cavity with minimal manipulation.
2. Identification as rapidly as possible of the offending organism obtained from the peritoneal cavity.
3. Immediate postoperative institution of sulfanilamide therapy by hypodermoclysis, continued by oral administration when fluids can be taken by mouth.
4. If a pneumococcus is obtained, substitution of sulfapyridine for sulfanilamide therapy and intravenous administration of type specific antipneumococcus serum.
5. (a) Use of high concentration oxygen and gastric siphonage to relieve abdominal distention; (b) maintenance of adequate fluid intake by parenteral and enteral routes; (c) repeated small blood transfusions to combat anemia and hypoproteinemia.

CONCLUSION

The high mortality rate in primary peritonitis can be strikingly reduced by early operation for recovery of the offending organism and drainage followed by adequate treatment with sulfanilamide in the streptococcic group and with type specific serum in the pneumococcic group.

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TABLE 5.—Mortality Rates in Pneumococcic and Streptococcic Peritonitis

Author	Pneumococcal Peritonitis			Streptococcal Peritonitis		
	Year	No. of Cases	Mor- tality, per Cent	Year	No. of Cases	Mor- tality, per Cent
Lipshutz, B., and Low- enberg, H.: J. A. M. A. 80:100, 1926	1926	13	100	1926	9	100
Ladd, W. E.: Pennsylv- ania M. J. 34:153, 1930	1930	15	66	1930	36	65
Doanovon ³	1934	12	75	1936	42	78
Cole ⁵	1937	26	54			
Leopold and Kaufman ⁴ ....	....	..	..	1937	12	91

blood cultures were negative and agglutinins were demonstrated in the patient's serum. Improvement in the patient's condition lasted for four days and then bacteremia recurred; the patient's condition declined until the eighth day, when he died.

MORTALITY

A characteristic feature of primary peritonitis is that it has been universally accepted that it has a high mortality rate (table 5). However, when the present series

9. Finland, Maxwell, Brown, J. W., and Rauh, H. E.: Treatment of Pneumococcic Meningitis, New England J. Med. 218:1033-1044 (June 23) 1938.

10. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Reuhoff, M. D.: The Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, J. A. M. A. 112:518-527 (Feb. 11) 1939.

FACTORS IN RECURRENCE OF
RENAL CALCULI

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The recurrent formation of renal calculi following the surgical removal of a stone from the kidney constitutes a major problem in the management of patients with renal lithiasis. That formation of secondary calculi will frequently occur unless adequate preventive measures are instituted seems plausible when it is obvious that, in the majority of instances, the underlying factors associated with the production of the primary calculus are not corrected or eradicated by the surgical procedure.

From experimental and clinical observation, it appears evident that no one etiologic agent is entirely responsible for the formation of all kidney stones. This emphasizes the necessity for an intensive preoperative investigation to ascertain the causative factors in each individual case. This facilitates correction of these factors at the time of surgical treatment or during the postoperative regimen. Certainly the operative procedure per se constitutes but one phase in the management of this group of patients, and to neglect an exacting preoperative investigation and adequate postoperative supervision will be attended by an unwarranted high incidence of recurrences. It is also evident that, while an investigation of the etiologic factors is essential during the preoperative period, additional factors known to be associated with the formation of calculi may be introduced or be directly attributed to surgical intervention, namely, trauma, infection and conditions conducive to the production of stasis.

Recurrent renal calculi may be of either one of the following two types:

1. True recurrence or the formation of a calculus after complete removal of the original stone.
2. False recurrence, or a persistence of stones or fragments of a calculus overlooked at the time of operation.

A knowledge of the true incidence of these recurrences is influenced by the frequency with which postoperative roentgenograms are secured. Misinterpretation of end results cannot be avoided unless roentgen study is made as a routine procedure after the operation. A small calculus may be overlooked at the time of operation, especially if multiple stones are being removed. Unless a roentgenogram is secured before the patient is dismissed from the hospital a recurrence, either asymptomatic in type or productive of renal colic, and which is noted by roentgen studies months later, may be misconstrued as a true recurrence or a stone that formed de novo, whereas it is really a false recurrence. When multiple calculi are being removed, I believe that a roentgenogram of the exposed kidney should be secured at the time of operation in order to avoid overlooking a small stone.

It is evident from the contributions of several authors that a progressive decrease in the incidence of recurrent renal calculi is taking place. In 1915 Cabot and Crabtree,¹ in reviewing the results secured in the treatment of renal calculi at the Massachusetts General Hospital,

reported that "recurrence" took place in 56 per cent of patients treated by nephrotomy and in 51 per cent of those treated by pyelotomy.

Barney² in 1922 again studied a series of cases from the Massachusetts General Hospital and stated that the incidence of recurrence was 32 per cent following the removal of a calculus from the kidney; however, it is interesting to note that postoperative roentgenograms revealed that stones were still present in the kidney in nine of twenty cases, or 45 per cent.

Braasch and Foulds³ in 1924 stated that calculi recurred in 10.79 per cent of the patients who were operated on at the Mayo Clinic. Herbst⁴ has noted the incidence of recurrence as 15 per cent, while Hunner⁵ in 1927 gave the incidence as 9.5 per cent following operations for renal stones and as 4.4 per cent following operations for ureteral calculi.

Oppenheimer⁶ in 1937 cited true recurrences following pyelolithotomy, pyelonephrolithotomy and nephrotomy in 14.9 per cent, 32.0 per cent and 29.4 per cent, respectively, of his cases.

Twinn⁷ in 1937 reviewed 314 operations for stone performed at the New York Hospital and stated that there were 28 per cent recurrences following nephrotomy and 20.9 per cent following pyelotomy. During the preceding year and a half, however, he stated that recurrences had been reduced to 5.3 per cent. At the Cleveland Clinic the incidence of recurrence prior to 1933 was 16.4 per cent. Between the years 1933 and 1939 this has been reduced to 4.9 per cent by adding the high vitamin A acid ash or alkaline ash diet to the other postoperative measures, thereby controlling the pH of the urine.

INFECTION

The relationship between infection and the formation of primary or recurrent calculi has been stressed for a long time. Brongersma's⁸ statistics illustrate the relationship between infection and recurrent renal lithiasis. In the absence of infection the incidence of recurrence was between 3 and 6 per cent, but it was approximately 27 per cent when the infection was slight and 50 per cent when severe.

Rovsing⁹ found that 68.18 per cent of all recurrences occurred when renal infection, either primary or secondary, was due to urea-splitting organisms. However, in 15.91 per cent of his cases the recurrences developed in the presence of sterile urine. Ten examples of renal stone due to the staphylococcus were reported by Boshamer¹⁰ in 1932. The formation of these calculi was probably due to the ability of certain members of this group to split the urea in the urine with the resultant formation of ammonia, a reaction favorable to the precipitation of the alkaline salts in the urine. In 1935 Runeberg¹¹ stressed the importance of anaerobic organisms in the genesis of calculi.

2. Barney, J. D.: Recurrent Renal Calculi, Surg., Gynec. & Obst. 35: 743-748 (Dec.) 1922.

3. Braasch, W. F., and Foulds, G. S.: Postoperative Results of Nephrolithiasis, J. Urol. 11: 523-537 (June) 1924.

4. Herbst, R. H.: Recurrent Renal Calculus: Its Cause and Prevention, Am. J. Surg. 12: 58-62 (April) 1931.

5. Hunner, G. L.: Calculus of Upper Urinary Tract Treated by New Methods; End Results, Tr. South. S. A. 40: 1-17, 1927.

6. Oppenheimer, G. D.: Nephrectomy versus Conservative Operation in Unilateral Calculous Disease of the Upper Urinary Tract, Surg., Gynec. & Obst. 65: 829-836 (Dec.) 1937.

7. Twinn, F. P.: Study of Recurrence Following Operations for Nephrolithiasis, J. Urol. 37: 259-267 (Feb.) 1937.

8. Brongersma, cited by Fowler, H. A.: Cococcus Infection of Kidney; Its Role in Formation and Recurrence of Stone, Urol. & Cutan. Rev. 35: 594-605 (Aug.) 1934.

10. Boshamer, K.: Staphylokokkensteine der Nieren, München. med. Wehnschr. 79: 1951-1953 (Dec. 2) 1932.

11. Runeberg, B.: Anaerobic Bacteria in Urine and Urinary Calculi. Finska läk.-sällsk. handl. 77: 737-746 (Dec.) 1935.

From the Cleveland Clinic.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Cabot, Hugh, and Crabtree, E. G.: Frequency of Recurrence of Stone in the Kidney After Operation, Surg., Gynec. & Obst. 21: 223-225, 1915.

A study of a series of 200 patients with recurrent renal calculi made at the Cleveland Clinic showed a coexisting renal infection in 81.5 per cent of the cases (figs. 1, 2 and 3), while the urine was sterile in 18.5 per cent (fig. 4). It was noted that when the stones were large an infection was usually present, while the urine was more frequently sterile in the presence of smaller calculi.

Determination of the chemical constituents of stones formed in the presence of sterile urine showed them usually to be composed of uric acid, cystine or oxalates, while the recurrent stones associated with renal infection were generally composed of phosphates, carbonates or mixtures of these salts with occasional traces of oxalates.

In considering the relationship of infection to recurrence, two types of infection must be considered. If the organisms possess the power of splitting urea, such as *Bacillus proteus*, there is a greater tendency for a recurrent calculus to develop than when the infection is due to *Bacillus coli*, an acid-forming organism which does not possess this power. This requires further elucidation, however, since the reports of Brown and Earlam¹² in 1933. These authors stated that 18 per cent of the bacilli which infect the urinary tract possess the power of splitting urea and that 40 per cent of *Staphylococcus albus* have similar properties. These organisms split the urea in the urine with the resultant formation of ammonia and carbon dioxide. This shifts the p_H of the urine to the alkaline side, enhancing the precipitation of the alkaline salts, i. e. phosphates and carbonates.



Fig. 1.—Recurrent renal calculi associated with proteus infection.

In the present series of cases, 9 per cent of the bacilli and 18 per cent of the staphylococci possessed this power. It was also noted that infection of the kidneys was much more frequent in the patients with bilateral recurrent renal calculi than in those with unilateral stones. The predominant organism cultured was *Staphylococcus albus*. It was found most frequently

in pure culture and usually was present in the mixed infections. *Bacillus proteus* in pure culture was the second chief offender, although other bacilli and streptococci in mixed cultures were often observed.

As the selection of medication employed to eradicate the renal infection may be influenced by knowledge as to whether the organisms split urea—and, in fact, certain drugs such as ammonium chloride may be contra-



Fig. 2.—Recurrent renal calculi associated with colon bacillus infection, the organism having the power of splitting urea.

indicated in the presence of a proteus infection—it should be a routine part of one's bacteriologic study to determine whether the offending organisms have the power of splitting urea. Similarly, in addition to a culture, a stained smear of the urinary sediment should be made in each case. While it appears true that infection plays a major role in the production of recurrent renal calculi, in view of the clinical observation that many recurrences develop in the presence of sterile urine, further search for etiologic factors is essential.

FOCAL INFECTION

In 1921 Rosenow and Meisser¹³ presented their experimental data which indicated the role of focal infection in the formation of renal calculi. They inoculated the pulps of the teeth of dogs with streptococci isolated from the urine of patients with renal lithiasis. Following this, calculi developed in the dogs and streptococci were again isolated from the urine.

In reviewing the present series of 200 recurrent renal calculi, definite foci of infection could be demonstrated in many instances, but there was no apparent relationship between the organisms cultured from these sites and those isolated from the urine. In view of the work of Rosenow and Meisser, however, I believe that foci present in the teeth, tonsils, cervix and prostate should be eliminated.

STASIS

Urosthesis in many instances seems definitely to be associated with the formation of recurrent renal calculi, and its presence is conducive to shifting the p_H of the

12. Brown, R. K. L., and Earlam, M. S. S.: Relation of Prolonged Immobilization and Urinary Tract Infection to Renal Calculous Formation, *Australian & New Zealand J. Surg.* 3: 157-171 (Oct.) 1933.

13. Rosenow, E. C., and Meisser, J. G.: Nephritis and Urinary Calculi After Experimental Production of Chronic Foci of Infection, *Collected Papers of Mayo Clinic* 13: 253-257, 1921.

RECURRENCE OF CALCULI—HIGGINS

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urine to the alkaline side. Hunner¹⁴ in 1924 stressed the importance of ureteral stricture in the formation of renal calculi.

In this series the intravenous urogram revealed evidence of stasis in 72 per cent of the cases. Either the calculus was producing varying degrees of obstruction at the ureteropelvic junction or obstruction was demonstrated in a calix containing the stone. It is difficult from the analysis of this group of cases to form an opinion as to whether stasis preceded the formation of the recurrent calculus or was produced subsequent to the formation of the calculus. In twenty-one instances a stone formed in the kidney following the surgical removal of a stone from the ureter on the same side (figs. 5 and 6).

Intravenous urograms in this group elicited definite evidence of ureteral obstruction at the site at which the calculus was removed in twelve instances. This serves to emphasize the value of employing intravenous urographic studies following the removal of a calculus from the ureter. These recurrences could probably have been prevented by dilation of the ureter and adequate care in the postoperative regimen.

VITAMIN A DEFICIENCY

Experimental and clinical observations demonstrating the relationship between a deficiency of vitamin A in the diet and the formation of renal calculi have been discussed previously.¹⁵ Some authors have stated that there is no evidence of deficiency of vitamin A among the people of this country. This presumption is based



Fig. 3.—Recurrent renal lithiasis associated with *Staphylococcus albus* infection, the organism having the power of splitting urea.

on impressions gained only from dietary histories elicited from the patients and may lead to erroneous deductions. The history alone does not provide sufficient evidence to state whether a person is receiving or utilizing adequate amounts of vitamin A, and biophotometric studies have shown how unreliable such information may be.

14. Hunner, G. L.: Ureteral Stricture: Report of Unusual Case Illustrating Influence on Formation of Urinary Calculi, *J. A. M. A.* 82: 509-516 (Feb. 16) 1924.
15. Higgins, C. C.: Experimental Production of Urinary Calculi, *J. Urol.* 29: 157-185 (Feb.) 1933; Production and Solution of Urinary Calculi, *J. A. M. A.* 104: 1296-1298 (April 13) 1935.

In previous communications I¹⁶ have noted that from 68 to 72 per cent of patients with renal calculi had a positive reaction to the biophotometer test, and in this study of patients with recurrent renal calculi 48 per cent had various degrees of vitamin A deficiency as shown by this method.

Dr. W. J. Ezickson¹⁷ in a personal communication stated: "There were twenty-five patients in our first

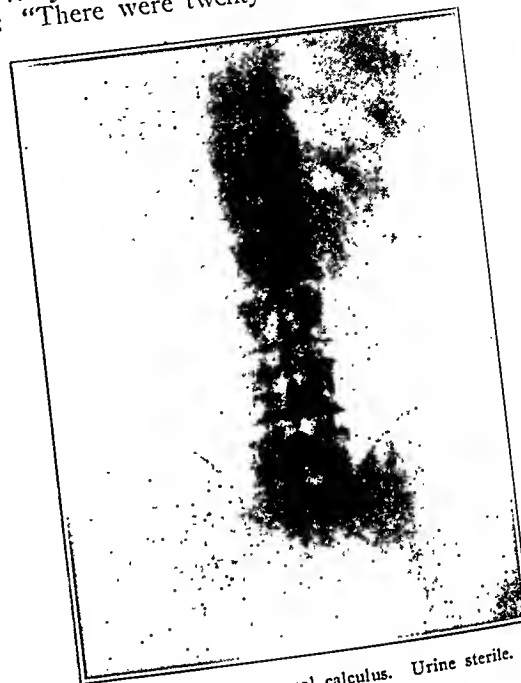


Fig. 4.—Recurrent renal calculus. Urine sterile.

series who have or have had renal calculi who were studied for vitamin A deficiency by means of the dark adaptation test. Twenty-four of these showed a pathological dark adaptation and only one was normal.

Jeghers¹⁸ stated: "More important, however, was the demonstration of the frequency of clinically detectable vitamin A deficiency in a group of 162 students examined. Of this group, 35 per cent had low photometric readings and 12 per cent had clinical manifestations of vitamin A deficiency." Youmans, in discussing Jeghers' paper, stated that when using a similar photometric test he found subnormal dark adaptation in one half of fifty clinic patients, the diets of many of whom were thought to be inadequate. In eleven of fifty-four supposedly normal subjects whose diets appeared to be well balanced a similar observation was made.

From these reports and those of Jeans¹⁹ and others it appears evident that varying degrees of vitamin A deficiency are more prevalent in this country than we have been led to believe. Vermooten²⁰ stated that calculi do not form in the South African Negro, as illustrated by a study of 1,091,000 Negro patients. According to his report the South African Negro lives

16. Higgins, C. C.: Factors Which Influence the Formation of Urinary Calculi; Clinical Application to Prevention of Recurrent Renal Calculi, *New York State J. Med.* 36: 1620-1628 (Nov. 1) 1936; Present Status of Dietary Regimen in Treatment of Urinary Calculi, *Brit. J. Urol.* 9: 36-46 (March) 1937.
17. Ezickson, W. J., and Feldman, J. B.: Signs of Vitamin A Deficiency in the Eye Correlated with Urinary Lithiasis, *J. A. M. A.* 109: 1706-1710 (Nov. 20) 1937.
18. Jeghers, Harold: Degree and Prevalence of Vitamin A Deficiency in Adults, with Note on Its Experimental Production in Human Beings, *J. A. M. A.* 109: 756-762 (Sept. 4) 1937; correction, September 18, p. 965.
19. Jeans, P. C., and Zentmire, Zelma: Prevalence of Vitamin A Deficiency Among Iowa Children, *J. A. M. A.* 106: 996-997 (March 21) 1936.
20. Vermooten, Vincent: Occurrence of Renal Calculi and Their Possible Relation to Diet as Illustrated in South African Negro, *J. A. M. A.* 109: 857-859 (Sept. 11) 1937.

on a simple, stable diet which is rich in vitamin A, high in acid-ash base and extremely low in calcium.

I believe therefore that a biophotometer test to determine the absence or presence of vitamin A deficiency should be a part of the examination of every patient with calculous disease (fig. 7). Furthermore, my associates and I prescribe vitamin A as a routine in the postoperative course for two reasons: first, to correct vitamin A deficiency if it is present and, second, for its effect on the epithelial structures.

HYPERPARATHYROIDISM

Albright and Bloomberg,²¹ Barney and Mintz²² and others have stressed the relationship between hyperparathyroidism and renal lithiasis. Barney and Mintz in 1934 reported a series of eighteen cases in which a diagnosis of hyperparathyroidism had been made and verified by surgical intervention. In eleven (61.1 per cent) calculi were present in the urinary tract. The youngest patient was 13 years of age and the oldest was 62. Involvement of the bones to varying degrees was present in twelve cases, while in six others urinary calculi and changes in the bones were found to coexist. The renal calculi were bilateral in four (36 per cent) of the eleven cases. Barney and Mintz conclude that hyperparathyroidism is responsible for from 4 to 5 per cent of the cases of renal calculi. In almost 70 per cent of cases of hyperparathyroidism stones may be present, while in approximately 38 per cent the patients have

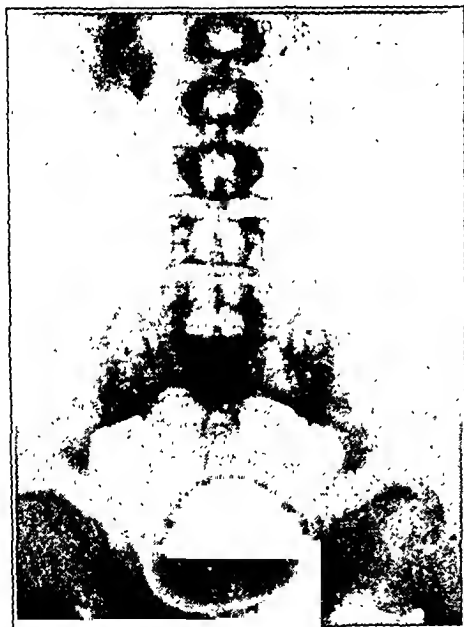


Fig. 5.—Stricture of right ureter following ureterolithotomy. Note stasis demonstrable by intravenous urogram.

changes in the bones and urinary tract. Barney and Mintz state and Albright and Bloomberg concur that hyperparathyroidism is so frequently a cause of renal lithiasis that in every patient with this condition it must be determined whether or not it is present. Therefore a careful study of the calcium and phosphorus content of the blood should be made in all patients with renal stones.

Griffin, Osterberg and Braasch,²³ in reviewing cases of urinary lithiasis at the Mayo Clinic, state that hyperparathyroidism was found to be an etiologic factor in less than 0.2 per cent of their cases. At the Cleveland Clinic, hyperparathyroidism has been associated with renal lithiasis in about 0.1 per cent of the cases. In one case in this series the presence of hyperparathyroidism was overlooked when the primary calculus was



Fig. 6.—Formation of renal calculus on the same side two years later.

removed. When the patient returned with a recurrent renal calculus a diagnosis of hyperparathyroidism was established and verified by blood studies. A tumor of the parathyroid glands was removed at the time of operation. Further recurrences have not developed.

Gilmour and Martin²⁴ have emphasized the relationship between the condition of the parathyroid glands and renal disease. Fowweather and Pyrah²⁵ in 1938 also studied the relationship between hyperparathyroidism and renal lithiasis. They noted the absence of any marked preponderance of high levels of blood calcium among cases of recurrent calculi as compared with those without recurrence. They state: "Hence the raised blood calcium which may be found in association with renal calculi is in general the result of renal damage, and the previous suggestions that it is not evidence of a primary hyperparathyroidism, which is the cause of the formation of calculi, is confirmed."

They state further that in the early stages of renal disease the response of the parathyroid glands to this stimulus may result, in a certain proportion of cases and for a certain length of time, in an enhanced activity of these glands, which is rather more than sufficient to counteract the tendency arising from renal disease, so that a raised blood calcium and to a less extent a reduced blood phosphorus make their appearance. As the renal disease progresses, the tendency toward a low

23. Griffin, Miles; Osterberg, A. E., and Braasch, W. F.: Blood Calcium, Phosphorus and Phosphatase in Urinary Lithiasis; Parathyroid Disease as Etiologic Factor, *J. A. M. A.* **111**: 683-685 (Aug. 20) 1938.

24. Gilmour, J. R., and Martin, W. J.: Weight of Parathyroid Glands, *J. Path. & Bact.* **44**: 451-462 (March) 1937.

25. Fowweather, F. S., and Pyrah, L. N.: Renal Calculi, Renal Disease and Hyperparathyroidism, *Proc. Roy. Soc. Med.* **31**: 593-604 (April) 1938.

21. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease, with Note as to Formation of Calcium Casts in This Disease, *Tr. Am. A. Genito-Urin. Surgeons* **27**: 195-202 (May 15) 1934.

22. Barney, J. D., and Mintz, E. R.: Some Newer Conceptions of Urinary Stone Formation, *J. A. M. A.* **103**: 741-743 (Sept. 8) 1934.

blood calcium and a high blood phosphorus appears to increase to a point beyond which it is impossible for the parathyroids to neutralize it, and thus the blood changes of advanced renal disease are evident. Thus careful selection must be made of patients in whom exploratory operation on the parathyroid glands is advised. It is true, however, that the possibility of hyperparathyroidism must be considered in all patients with renal lithiasis, and no preoperative investigation is complete without due consideration of this disease.

METABOLIC FACTORS

Cystinuria.—This is a familial disease which results from derangement of the intermediate protein metabolism of the body. In normal persons cystine is oxidized completely and the sulfur is excreted as a sulfate. It is stated that calculi develop in about 2.5 per cent of patients suffering from cystinuria (fig. 8). However, Seeger and Kearns²⁶ in 1925 collected 181 cases of

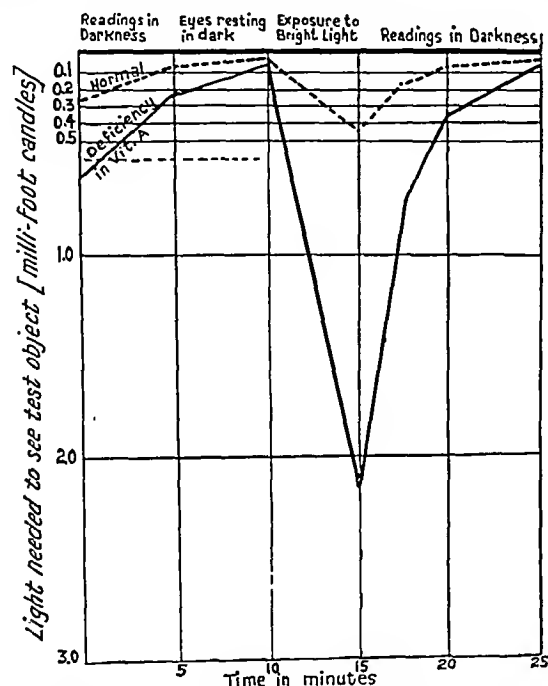


Fig. 7.—Biophotometric reading on a patient with recurrent renal calculi. Note the return to normal when adequate amounts of vitamin A were administered.

cystinuria, 124 of which were complicated by stone formation. Cystine may be found in the urine partly in solution and partly as a crystalline deposit. A diagnosis of cystinuria is made in the majority of cases by a microscopic examination of the urinary sediment. Treatment consists of increasing the solubility of the cystine in the urine by the administration of alkalis and by restriction of the protein intake. Maintenance of an alkaline reaction of the urine diminishes definitely the possibility of the formation of a calculus.

Gout.—Gout is another metabolic disease in which excessive amounts of crystalloids appear in the urine, microscopic examination of the sediment revealing the presence of uric acid crystals and urates. Not only may calculi composed of uric acid be produced, but the patient may experience attacks of colic as showers of uric acid crystals are passed. Other clinical manifestations of gout need not be present for uric acid calculi to form. Normally, in man, from 0.3 to 1.2 Gm. of uric acid is excreted daily. The amount excreted is

influenced by the diet of the individual. Postoperatively, a low purine diet in conjunction with the high vitamin A alkaline ash diet assists in minimizing the incidence of recurrent formation of this type of calculus.

Oxaluria.—Oxaluria has been stated by Neville²⁷ to be associated with a deficiency of vitamin B. Oxalic acid, which has both an exogenous and an endogenous source, is excreted in the urine in amounts of approximately 15 to 20 mg. daily. Experiments have indicated that, if an animal is maintained on a diet containing a fixed amount of calcium oxalate, the amount of the urinary oxalate can be increased by the administration of acids and decreased by alkalis. If the calculus is found to be composed of oxalates, the foods having a high oxalic acid content should be restricted in the postoperative regimen.

Xanthine.—Urinary calculi composed of xanthine are of rare occurrence. Kretschmer²⁸ in 1937 collected a series of fifteen cases and added one of his own. Mathews²⁹ states that the most important purine found in the human urine is uric acid, but there are present also from 30 to 50 mg. of purine bases—xanthine, hypoxanthine, guanine and adenine. He estimates that from 16 to 60 mg. of purine bases are eliminated in the urine daily as the purines are the end products of the metabolism of the nucleins. Postoperatively, foods with a high purine content should be restricted if the calculus is composed of xanthine.

Phosphaturia.—The type of phosphaturia present must be determined. Temporary phosphaturia may be caused by eating foods containing an excess of alkaline ash. Permanent, infected phosphaturia is associated with the presence of an organism that has the power of splitting urea. In this type the urea is transformed into ammonium carbonate, the ammonia then combining with the magnesium and phosphoric acid to form triple phosphate, while the carbonate combines with the calcium, forming calcium carbonate. Permanent, non-infected phosphaturia is stated to be due to alteration in function of the gastrointestinal tract.

Snapper³⁰ believes that all factors which tend to stabilize the labile colloids must help prevent the formation of stones. The presence of salicylates, mandelates, hippurates and other organic salts in the urine may, by increasing the stability of the urinary colloids, exercise a prophylactic influence against the formation of stones. He states:

Factors which may have a preventive or even a curative effect on the formation of renal calculi are:

1. Administration of foods with an acid-ash which increases the acidity of the urine and the solubility of the calcium salts.
2. Artificial acidosis by ingestion of ammonium chloride, ammonium nitrate, or other compounds.
3. Large supply of vitamin A.

Residues of kidney stones and urinary gravel may be prevented by the use of these measures. It is also evident that the presence of hippurates, salicylates, mandelates and other organic salts in the urine must be of great importance in the prevention of renal stones.

TRAUMA

A review of the literature indicates that recurrences following nephrolithotomy and nephropelviolithotomy are more frequent than when pelviolithotomy is

27. Neville, D. W.: Constitutional Factor in Oxaluria, *Urol. & Cutan. Rev.* 29: 32-33 (Jan.) 1935.

28. Kretschmer, H. L.: Xanthin Calculi, Report of Case and Review of Literature, *J. Urol.* 38: 183-193 (Aug.) 1937.

29. Mathews, A. P.: *Physiological Chemistry*, ed. 5, New York, William Wood & Co., 1930, pp. 764, 1175.

30. Snapper, I.: Pathological Physiology of Secretion of Urine, *Proc. Internat. Cong. Urol.*, 1936, pp. 575-617.

26. Seeger, S. J., and Kearns, W. M.: Cystinuric Lithiasis, *J. A. M. A.* 85: 4-7 (July 4) 1925.

employed. In nine cases in this series a blood clot was found to be the nucleus for a recurrent stone. Braasch and Foulds³ in 1924 estimated a recurrence of 10.79 per cent, a recurrence of 11.85 per cent following pyelotomy and 24.03 per cent following nephrolithotomy. Certainly a minimum of trauma should be inflicted during the surgical procedure, and a pelvolithotomy should be performed whenever possible.

TYPE OF STONES

The surgical removal of a branched stone extending into the calices is more likely to be followed by a recurrence than when a smaller stone is removed which is confined to the pelvis of the kidney. This may be due to injury of the calix or infundibulum, allowing blood clots to remain behind, subsequent development of stricture of the infundibulum which is conducive to stasis in the calix and later infection, or a small stone or fragment of a stone may be overlooked in one of the calices.

It is apparent that the removal of multiple calculi from the kidney is attended by a greater increase of recurrence than when a solitary stone is removed. Frequently a small calculus or a fragment which may not even be discernible on the roentgenogram has been removed by a suction apparatus which we employ as a routine following the removal of a stone from the kidney. Similarly, if a coexisting infection is present in the kidney, especially of a staphylococcus or proteus bacilli, the incidence of recurrence following operation is more than when culture of the urine is sterile.

In a similar manner, stones of soft consistency are more prone to be followed by a recurrence, possibly because sand remains to act as a nucleus for secondary formation. After removal of a calculus from the kidney, thorough lavage of the calices and pelvis followed by suction with the apparatus I have previously described will minimize the incidence of recurrent stone formation.

SURGICAL ASPECTS OF PREVENTION

There is little doubt that the surgical procedure which is accompanied by a minimum degree of trauma to the kidney is preferable. I do not believe that as a routine the kidney should be manhandled, traumatized and delivered into the incision in removing a stone from its pelvis. Rather, the operative procedure should be carried down to the pelvis of the kidney and adequate exposure secured by use of flexible retractors without delivering the kidney. In instances in which there is no coexisting renal infection or, if it is not pronounced, the incision in the pelvis should be closed with triple 0 catgut sutures passing only through the outer coats of the pelvis and not through the mucosa, where it might be retained and act as a nucleus for a recurrent calculus.

Joly³¹ has stated that even temporary leakage of urine increases the risk of recurrence of stone and should be avoided if possible. He likewise believes that if the kidney has been drained it is usually found to be infected with *Staphylococcus albus*. Similarly, Rovsing¹⁰ has stated that urinary leakage of only a few days duration is sufficient to infect the kidney. In cases, however, in which a pronounced infection is present, it may be advisable to perform a nephrostomy, or a catheter may be left directly in the pelvis to permit lavage and facilitate adequate drainage.

Nephrolithotomy is employed only when pelvolithotomy does not seem feasible. In all cases it should

be as conservative as possible. When a calculus is confined to a calix and the infundibulum is too narrow to permit its extraction through the pelvis, a localized nephrolithotomy is advisable. Again, in the removal of staghorn stones, nephrolithotomy may be necessary, and I believe that adequate drainage should be instituted in these cases.

A pelvonephrolithotomy, in my experience, is seldom necessary, and only if technical difficulties arise.

A heminephrectomy may be the preferable operative procedure in some instances in which a calculus is confined to a large, dilated calix. In the presence of a stricture of the infundibulum and infection of the calix, the latter can be eradicated only by this procedure, and fewer recurrences will follow this method than if a localized nephrotomy is done. Likewise, the remaining portion of the kidney is saved from the ravages of infection.



Fig. 8.—Recurrent renal and bladder calculi in a patient with cystinuria.

Again I wish to stress the importance of thoroughly lavaging the pelvis and calices followed by the use of a suction tube again placed in the pelvis and calices to remove clots, debris, fragments of stones or minute stones and sand that might be overlooked.

CONCLUSIONS

It is apparent that many factors may be associated with the formation of recurrent renal calculi. An intensive preoperative investigation is required in each individual case to ascertain the factor or factors instrumental in the production of the primary calculus. Their correction and eradication at the time of operation or in the postoperative routine is rewarded by a reduction in the incidence of recurrence. In addition to eradication of the various etiologic agents, control of the p_H of the urine by the high vitamin A acid ash or alkaline ash diet, depending on the chemical constituents of the stone removed at the time of operation, has been attended by a pronounced decrease in the incidence of recurrent formation of calculus in our hands.

2020 East Ninety-Third Street.

³¹ Joly, J. S.: *Stone and Calculous Disease of the Urinary Organs*, St. Louis, C. V. Mosby Company, 1929.

CALCIUM AND PHOSPHORUS EXCRETION IN THE URINE

OF PATIENTS WITH RENAL OR URETERAL CALCULI

R. H. FLOCKS, M.D.

IOWA CITY

Many workers have indicated the possibility that the increased urinary concentration of calcium and phosphorus associated with certain generalized conditions such as hyperparathyroidism,¹ bone disease and fractures² may be an important factor in calcium urolithiasis. However, little quantitative work on this concentration in patients with urinary calculi is available.

Since on theoretical, experimental³ and clinical grounds it would seem that increased urinary concentration of calcium and phosphorus should be an important factor in the formation of stone, it was felt that a quantitative study of the urinary calcium and phosphorus in all types of patients with calcium urolithiasis and the quantitative differences in this factor as the result of treatment would be of significance from an etiologic, prognostic and therapeutic point of view. It is my purpose in this paper to present the results of such a study in a series of thirty-five consecutively admitted patients with renal or ureteral calculi.

SUBJECTS

Thirty-five consecutively admitted patients with calcium stones in the kidneys or ureters form the basis of this study. Their ages ranged from 19 to 70 years, but the vast majority were from 20 to 40 years of age. Twenty-two of them were men and thirteen were

the late stages of Paget's bone disease. Only one presented vitamin A deficiency, although twenty of them were studied by means of the Jeans biophotometer test. This deficiency was speedily rectified by the administration of vitamin A. Two patients presented hyperparathyroidism, as evidenced by increased serum calcium, decreased serum phosphorus and increased urinary calcium. Neither had bone changes. A parathyroid adenoma was subsequently removed from one of them. Four months after operation this patient continued to excrete large quantities of calcium in the

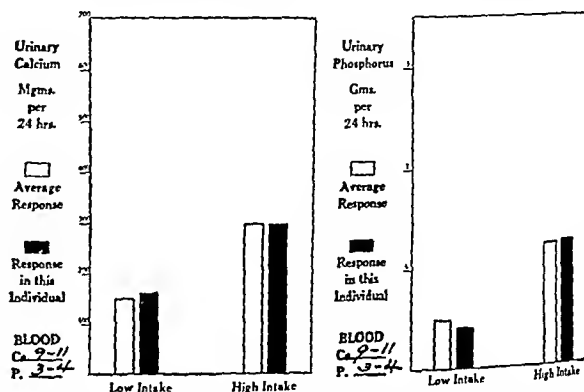


Fig. 2.—Urinary excretion of calcium and phosphorus by a white woman aged 43 with left renal stone. There was a history of hyperthyroidism with subtotal thyroidectomy eleven years previous to admission. At present the patient has essentially normal urinary excretion of calcium and phosphorus. Compare this response to the fixed diets with that illustrated in figure 1.

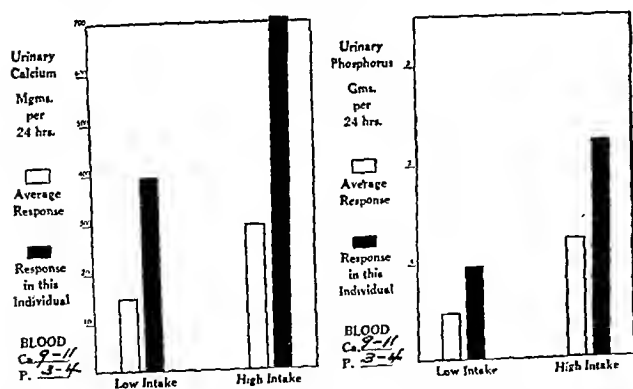


Fig. 1.—Urinary excretion of calcium and phosphorus by a white man aged 21 with a calcium oxalate stone in the right ureter. The pH of the urine was 5.5. At the present time the patient shows very high urinary excretions of calcium on both low and high intakes. Note that the excretion of phosphorus is also moderately increased, but not as markedly as the calcium. Compare this response to the fixed diets with that illustrated in figure 2.

women. All of them except one, who had generalized atrophic arthritis, were ambulatory during the course of the studies. Of the ambulatory patients, one was in

urine, although the blood calcium and phosphorus levels, which had returned to normal immediately after operation, were still normal. The other patient refused operation, so that direct proof of parathyroid disease was lacking. All the patients suffered from some slight infection of the urinary tract, as evidenced by the finding of an occasional pus cell in the urine, but none of them had outspoken urinary sepsis. Organisms were found in the urines of all patients. These were *Staphylococcus albus* and *aureus*, *Bacillus proteus*, *Bacillus coli* and *Staphylococcus haemolyticus* either alone or together. No fevers, colds or other intercurrent infections were noted. In addition, twelve volunteers without any evidence of stone or other abnormalities were used as controls.

METHODS AND RESULTS

Metabolic studies including accurate weighing and analysis of all food and water ingested and of all urine excreted were carried out on each patient. Since four different methods of attack were used, the individual methods will be described in the appropriate section.

EFFECT OF DIETS WITH HIGH AND WITH LOW CALCIUM AND PHOSPHORUS CONTENT AND WITH NEUTRAL ASH

In order to ascertain whether or not there is an excessively high concentration of calcium and/or phosphorus in the urine of patients with calculus, each of the thirty-five subjects as well as the twelve normal volunteers was placed successively on (a) a diet low in calcium and phosphorus, with a daily intake of 0.3 and 0.8 Gm. respectively and producing a neutral ash and (b) a diet high in calcium and phosphorus with a daily intake of 2.5 Gm. of each and producing a neutral ash. Each diet was fed identically to each patient and control for a six day period. The daily fluid intake was identical for each subject and control and was limited to 2,000 cc.

From the Department of Urology, State University of Iowa College of Medicine.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

Dr. N. G. Alcock of the Department of Urology and Dr. Kate Daum of the Department of Nutrition of the State University of Iowa College of Medicine gave the author valuable aid and discussed this subject with him during the course of this study.

1. Barney, J. D., and Mintz, E. R.: The Relation of the Parathyroid Glands to Urinary Lithiasis, *J. Urol.* 36: 159-167 (Aug.) 1936.

2. Jones, R. W., and Roberts, R. E.: Calcification, Decalcification, and Ossification, *Brit. J. Surg.* 21: 461-499 (Jan.) 1934. Holmes, R. J., and Coplan, M. M.: Extensive Bilateral Renal Calculus of Rapid Development Following Fracture of the Vertebrae, *South. M. J.* 27: 228-233 (March) 1934.

3. Keyser, L. D.: Recurrent Urolithiasis: Etiologic Factors and Clinical Management, *J. A. M. A.* 104: 1299 (April 13) 1935.

Repeated studies of seven patients were made at intervals of several months and in each instance the results were essentially the same.

In eleven of the control group of twelve volunteers the average calcium excretion, as might be expected, varied with the diet, being from 100 to 150 mg. a day on the low intake and from 250 to 300 mg. a day on the high intake. One of the "normal" controls showed an excretion of 220 mg. of calcium a day on the low intake and 460 mg. on the high intake.

The thirty-five patients with stone, however, very definitely divided themselves into two groups (figs. 1 and 2): Group 1, a large one consisting of twenty-three of the thirty-five patients, showed an increased or high urinary excretion of calcium; group 2, a comparatively small one consisting of twelve of the thirty-five patients, showed either a normal or a low urinary excretion of calcium. The phosphorus excretion in all the patients, with one exception, was essentially normal for each diet. The one exception showed a high phosphorus excretion associated with a high calcium excretion.

All of the first group of twenty-three patients excreted more than 420 mg. of calcium a day on the diets rich in calcium and phosphorus, and a daily cal-

To review, then, in a group of thirty-five patients with urinary calculi twenty-three showed excessive excretion of calcium in the urine. Because the excess over normal was exaggerated on the high intake, this excessive excretion could be demonstrated most readily by noting the response of the urinary calcium to the

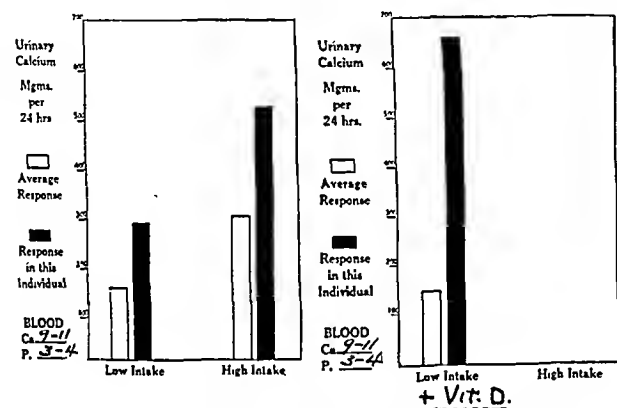


Fig. 3.—Urinary excretion of calcium by a white man aged 28 with a right renal calculus. The stones were calcium phosphate. Urinary calciums were studied repeatedly over a period of eighteen months and remained persistently high, while urinary phosphorus remained normal. Note the marked increase in urinary calcium when vitamin D in moderate doses was added to the neutral ash diet low in calcium and phosphorus.

cium excretion of more than 600 mg. was not uncommon. These values are comparable to those seen in hyperparathyroidism. Twenty-one of these patients excreted more than 200 mg. a day, but the remaining two excreted less than 200 mg. on the low intake diets. Both of the patients with hyperparathyroidism were in this group of subjects with excessive output of urinary calcium. Moreover, it is of especial interest that all those patients (ten of the thirty-five) with rapidly developing stones or with rapid formation of new stones fell into this group.

Of the group of twelve patients with normal or subnormal urinary excretion of calcium three presented a history which suggested that at the time when the urinary calculi originated there was probably an increased urinary excretion of calcium or phosphorus. There was neither a history nor indications in the remaining nine cases to suggest such a contingency. However, in none of these cases at the time these studies were made was there evidence of rapid growth of stones or of new formation of stones, and in three of them kidney stone had been known to be present and quiescent over a period of years.

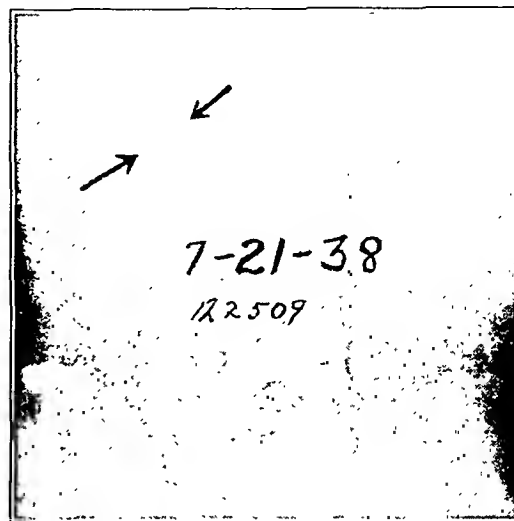


Fig. 4.—Appearance of plain x-ray film in a case of right renal stone in a white man aged 64.

high calcium and phosphorus intake. Only two of these twenty-three had hyperparathyroidism. In the other twenty-one no definite reason for the excessive urinary calcium was to be found. Moreover, all patients showing rapidly forming stones or new stone formation while under observation showed high urinary calcium excretion. Also of the twelve patients with a low urinary

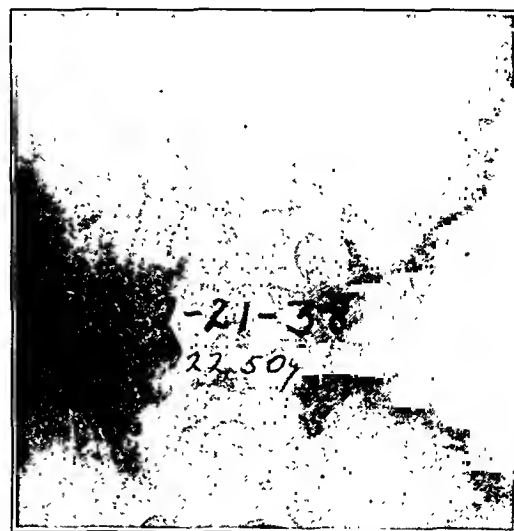


Fig. 5.—Excretory pyelograms of same patient as in figure 4. Note that there is good renal function bilaterally with practically no distortion of the right pelvis. The calcium concentrations in the kidney urines were 36 mg. per hundred cubic centimeters on the right and 18 mg. on the left. The phosphorus concentrations were 76 mg. on the right and 43 mg. on the left.

calcium three gave a history of a condition associated with increased urinary calcium at the time when the urinary calculi probably originated. Thus a marked increase in excretion of urinary calcium was demonstrable at one time or another in twenty-six of the thirty-five subjects with urolithiasis.

THE EFFECT OF DIETS WITH AN ACID ASH

The fact that calcium phosphate does not precipitate readily at a low urinary p_H has caused many workers⁴ to emphasize the necessity of keeping the urinary p_H low in these patients in order to prevent recurrence of renal calculi and possibly dissolve a certain number of them. For this reason diets with a high acid ash supplemented by substances such as ammonium chloride and ammonium nitrate have been advocated. However, Albright⁵ and others⁶ have emphasized the fact that the ingestion of acid-forming substances usually is associated with an increased calcium excretion in the urine. This, of course, would tend to neutralize the effect of the lower p_H . Therefore, in order to estimate this relationship quantitatively we studied the effect of an acid ash diet and ammonium chloride in both groups of patients, i. e. in the group with excessive urinary calcium excretion and in the group with the essentially normal or low urinary excretion of calcium. When the group with the high urinary calcium excretion was placed on an acid ash diet supplemented by 4 Gm. of ammonium chloride daily, a marked increase in urinary calcium was obtained. Thus on an acid ash diet containing 0.8 Gm. of calcium daily urinary excretions of from 400 to 450 mg. of calcium a day were obtained. In contradistinction, the group presenting the low urinary calcium showed low responses to the same diet

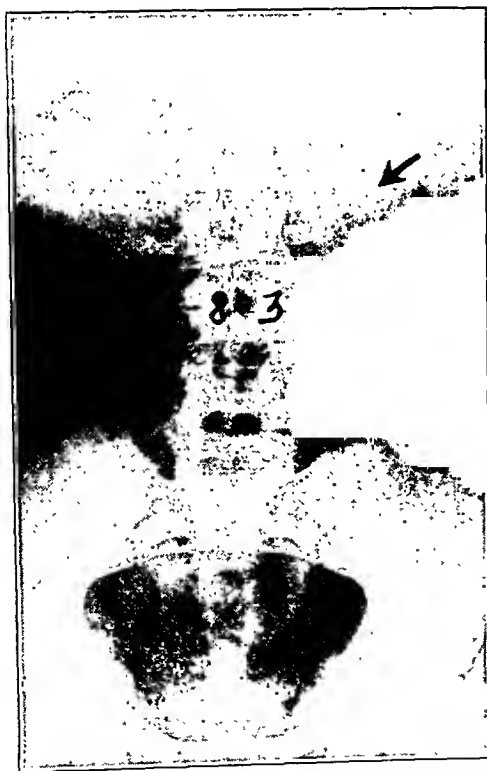


Fig. 6.—Appearance of plain x-ray film in a case of a normal right urinary tract and a left hydro-ureter and hydronephrosis due to a congenital stricture at the ureterovesicular junction in a white man aged 24.

and medication. Values of from 200 to 250 mg. of calcium in the urine per twenty-four hours were obtained. This is of considerable import in the treat-

ment of patients with renal stones by means of the acid ash diet. In the first group, the group showing high urinary calcium, relatively little or no beneficial effect is to be expected from the acid ash diet. Moreover, if urea-splitting organisms are present in the urine or the slightest amount of stasis is present harmful effects,

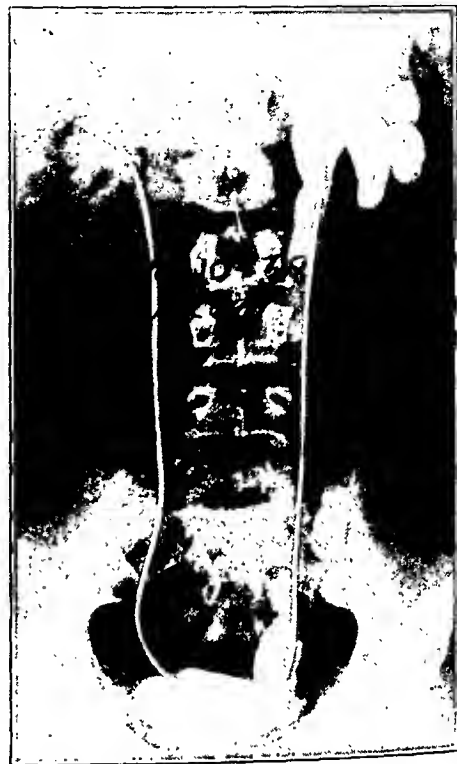


Fig. 7.—Retrograde pyelogram of same patient as in figure 6. Note that there is present a gradually enlarging left renal calculus. There is good function bilaterally. The calcium concentrations in the kidney urines were 8 mg. per hundred cubic centimeters on the right and 14 mg. on the left. The phosphorus concentrations were 8 mg. on the right and 9 mg. on the left.

such as were obtained by Oppenheimer and Pollack,⁷ may result. In contrast, in the second group of patients, those showing a low urinary calcium and a low urinary calcium response to the acid ash diet, this type of diet is ideal if the desired urinary p_H can be obtained.

EFFECT OF DIETS SUPPLEMENTED BY VITAMIN D

A great many of the preparations of vitamin A are at present combined with vitamin D. Experimentally vitamin D is known to produce an increased urinary excretion of calcium. I have, therefore, studied the urinary calcium and phosphorus excretion in normal persons and also some of the patients who showed an increased urinary calcium output. The number of patients in whom complete studies were made is still quite small. However, all the patients with an increased urinary calcium excretion and renal calculi when placed on moderate doses of vitamin D showed an excessive urinary calcium response. This response was much more marked than that obtained in the normal volunteers. This finding is similar to the observations of Mawson,⁸ who studied the urinary excretion of calcium in a group of tuberculous patients receiving heliotherapy (fig. 3).

4. Higgins, C. C.: Production and Solution of Urinary Calculi, *J. A. M. A.* 104: 1299 (April 13) 1935.

5. Albright, Fuller; Baird, P. C.; Cope, Oliver, and Bloomberg, Esther: Studies on the Physiology of the Parathyroid Glands: IV. Renal Complications of Hyperparathyroidism, *Am. J. M. Sc.* 187: 49-65 (Jan.) 1934.

6. Barney, J. D., and Sulkowitch, H. W.: Progress in Management of Urinary Calculi, *J. Urol.* 37: 746-762 (June) 1937.

7. Oppenheimer, G. D., and Pollack, Herbert: Attempted Solution of Renal Calculi by Dietetic Measures, *J. A. M. A.* 108: 349 (Jan. 3) 1937.

8. Mawson, E. E.: A Consideration of Some Possible Factors Concerned in the Development of Urolithiasis in Children, *Liverpool Med. Chir. J.* (pt. 2) 40: 99-133, 1932.

These significant quantitative differences in urinary calcium following the administration of high acid ash and vitamin D intakes illustrate the necessity of studying in each individual patient that patient's response to the therapy that is being instituted.

EFFECT OF URINARY STASIS

In order to ascertain the effects of urinary stasis and of other diseases of the urinary tract on the urinary excretion of calcium, studies were made on urine obtained by simultaneous catheterization of each ureter (figs. 4-9). In this way the normal kidney acted as a control for the pathologic one. Fourteen patients were studied in this manner. Although it is difficult to draw conclusions from so small a group, the trend is definite. Apparently a slight or intermittent obstruction or a slight to moderate pathologic process in the urinary tract, such as the presence of a small stone in the kidney pelvis, was associated with a significantly higher calcium concentration in the urine from that kidney than in the urine from the normal kidney. At times this concentration of calcium in the urine was twice that found in the normal mate. In contrast, complete obstruction or marked destruction of the kidney substance was always associated with a reduced calcium concentration. These observations are consistent with those of Hunner⁹ and others as to the relation of stasis to urinary stones. Moreover, they emphasize the danger that a new nucleus may be formed in the kidney substance during the time consumed while waiting for a kidney stone to pass spontaneously. Also they may account for unilateral stone formation in the group of patients with a tendency to excessively high urinary calcium.

EFFECT OF VARIATION OF FLUID INTAKE

Corresponding to the results obtained by Albright, we found that the total daily urinary calcium excretion



Fig. 8.—Appearance of plain x-ray film in a case of one large and several small right renal calculi in a white man aged 45.

was quite independent of the water excretion, so that increased output of water merely diluted but did not change the calcium and phosphorus output. Therefore, the most satisfactory method for decreasing urinary calcium and phosphorus concentration is the intake of large quantities of water.

9. Hunner, G. L.: Calculus of the Upper Urinary Tract, with Special Consideration of Recurring Stone Formation, Tr. West. Branch, Am. Urol. A. 2: 65-86, 1933.

COMMENT

Two groups of factors may be considered as fundamental in the pathogenesis of renal stone: (1) those factors which so change the nature of the renal substance as to favor precipitation of the crystalloids within it and (2) those factors which favor the precipitation

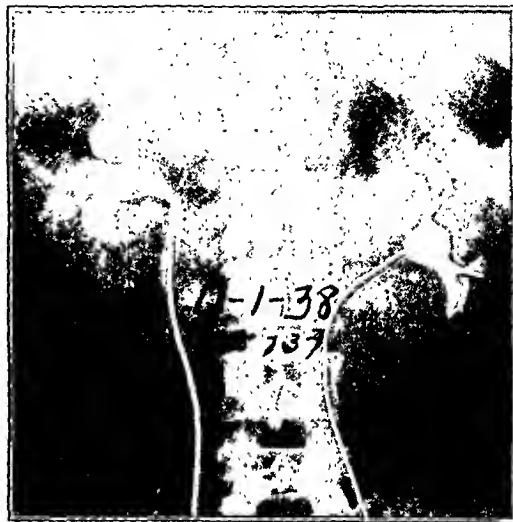


Fig. 9.—Retrograde pyelogram of same patient as in figure 8. Note that renal function was very much decreased on the right side. The concentrations of calcium in the kidney urines were 6 mg. per hundred cubic centimeters on the right and 16 mg. on the left. The concentrations of phosphorus were a trace on the right and 10 mg. on the left.

of crystalloids in the urinary passageway. In any individual patient either or both groups of factors may be operating at the same time or at different times.

Damage to the kidney substance predisposing to the precipitation of crystalloids is of importance in many cases. However, the exact factors that produce this type of damage with the associated precipitation of calcium salts are not known. Randall¹⁰ has demonstrated subepithelial plaques of precipitated calcium which formed a nucleus for stone formation. Hellstrom, Huggins¹¹ and others¹² have demonstrated similar lesions and precipitations within and about the tubules and so-called microliths in kidneys associated with renal calculi. Precipitations of this sort appear experimentally and clinically in vitamin D "poisoning" and in hyperparathyroidism.¹³ In both these conditions there is an increased urinary calcium excretion. This excessive excretion may be the underlying factor, or at least a very important factor, in the formation of these calcium deposits. Higgins⁴ and others have established the fact that there is a definite relationship between vitamin A deficiency and stone formation. Vitamin A deficiency may act by destroying the vitality of the renal epithelium, thus permitting precipitation of calcium and phosphorus within it. Infection in the renal pelvis itself and obstruction to the outflow of urine from the pelvis may likewise damage the kidney substance. In this clinic twenty-one of a series of fifty-three kidneys in which renal stone was or had been present were found to have microscopic deposits of calcium within the tubules or the tubular epithelium, or microliths as

10. Randall, Alexander: Surg., Gynec. & Obst. 64: 201 (Feb.) 1937.

11. Huggins, C. B.: Bone and Calculi in the Collecting Tubules of the Kidney, Arch. Surg. 27: 203-215 (July) 1933.

12. Craibtree, E. D.: Calcification Within Tubules of Kidney in Association with Urinary Tract Lithiasis, Tr. Am. A. Genito-Urin. Surgeons 23: 17, 1930.

13. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease, J. Urol. 3: 1-7 (July) 1935.

described by Randall, Hellstrom, Huggins and others. These lesions are strikingly similar to the lesions described in hyperparathyroidism, vitamin D "poisoning" and experimental stone production by hyperexcretion of crystalloids (Keyser¹⁴). Thus precipitations of crystalloids in the kidney substance of each individual patient may be produced by any one or any combination of the following factors: toxins, vitamin A deficiency, vitamin D poisoning, hyperparathyroidism, increased urinary calcium and phosphorus due to other causes, infection in the renal pelvis or urinary tract obstruction.

The two fundamental factors determining the precipitation or solution of calcium and phosphorus in the urinary passageways are the urinary p_H and the urinary concentration of calcium and phosphorus. Certain accessory factors may also be of importance: the colloids of the urine, the surface tension of the urine, the presence of stasis and the presence of bodies that might act as nuclei for the precipitation of crystalloids. The importance of the hydrogen ion concentration and the ease with which this concentration can be changed to the alkaline side by urea-splitting organisms, together with the marked frequency with which these organisms occur in patients with renal calculi, has been demon-

previous paragraphs, increased excretion of calcium and phosphorus in the urine may be of importance in both groups of factors.

The high incidence of increased urinary calcium in the thirty-five cases of calcium urolithiasis described in this report emphasizes the relationship between urinary calcium and the pathogenesis of renal calcium stones. Moreover, the fact that twenty-one of these patients showed no evidences of hyperthyroidism, hyperparathyroidism or bone disease emphasizes the fact that high urinary calcium may be present in these patients and must be considered in their prognosis and treatment even though conditions usually associated with increased urinary calcium are absent.

It would seem that, although the high concentration of the calcium in the urine of itself is not enough to bring about precipitation in the kidney substance or in the urinary passageway, it would predispose these patients to this occurrence. Therefore, given a patient or an otherwise normal person with a high urinary calcium, other factors being equal, he would be more likely to form stone than one with a low urinary calcium. For example, given two persons with infection of the urinary tract presenting urea-splitting organisms, the question as to the one who will form stone may depend on the urinary concentration of calcium. Similarly in deciding which patient will have a recurrence of stone following operative removal of urinary calculus, other factors being equal, urinary concentration of calcium will be the deciding factor.

Moreover, because of this relationship between urinary calcium excretion and urolithiasis, conditions that are associated with increased urinary calcium need complete quantitative study from this angle. When does the increased urinary calcium occur? How can it be modified? (fig. 10). In this way information may be obtained which will be of importance in the prevention of the occurrence and recurrence of calcium stone in the urinary tract.

The urinary calcium is of importance not only from an etiologic point of view but also from a prognostic and therapeutic point of view. The results of these studies emphasize the necessity of studying quantitatively the calcium excretion in the urine under different types of therapy instituted. They show that when increased urinary calcium is found the prognosis is poor and that acid ash diets and vitamin D should be used with care. Marked dilution of the urine should be sought for and all possible sources of this high urinary calcium searched for and eliminated. In contrast, in patients with low urinary calcium the prognosis is better and beneficial effects may be expected from acid ash diets. Moreover, in considering the problem of recurrence of stone in a particular kidney, the possibility of altered urinary excretion of calcium through that particular kidney is of importance.

SUMMARY AND CONCLUSIONS

1. A study was made of the urinary excretion of calcium and phosphorus under fixed conditions in a group of thirty-five patients with renal calculi. In twenty-three patients of this series high urinary calcium excretion was found. In three of the twelve with low urinary calciums there was a history suggesting increased urinary excretion of calcium at a time when the calculi probably started. Only two of these patients had clinical evidences of hyperparathyroidism.

2. All the patients with rapidly growing stones or new stone formation during observation were in the group presenting the high urinary excretion of calcium.

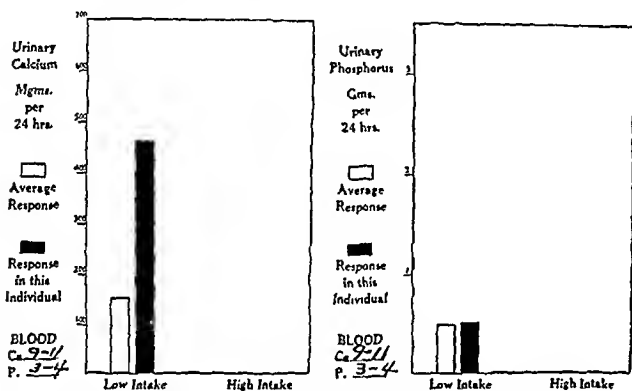


Fig. 10.—Urinary excretion of calcium and phosphorus by a patient with a fracture of the left femur of a week's duration. The patient is bedridden with the left lower extremity immobilized. Note the high urinary calcium response to the low intake.

strated by many workers. Experimentally the importance of the increased concentration of crystalloids in the urine has been emphasized by Keyser. The high incidence of urinary stone in hyperparathyroidism, in which increased urinary excretion of calcium and phosphorus occurs, has been emphasized by Albright and Barney. The high incidence of urinary calculi in patients with bone disease, in whom presumably there is some alteration in calcium metabolism probably associated with increased calcium excretion, has been emphasized by Holmes and Coplan and by Jones and Roberts and others. Steiner¹⁵ has demonstrated that the epithelial desquamation which occurred in vitamin A deficiency may act as a nucleus for the precipitation of crystalloids. Again there is a multiplicity of factors one or more of which may be present in each patient.

There are, then, two groups of factors in the pathogenesis of renal stone: first, those factors which are associated with the precipitation of crystalloids in the kidney substance and, second, those which are associated with the precipitation of the crystalloids in the urinary passageway. Moreover, as discussed in the

¹⁴ Keyser, L. D.: The Mechanism of the Formation of Urinary Calculi, *Ann. Surg.* 77: 210 (Feb.) 1923.

¹⁵ Steiner, Morris; Zugar, Bernard, and Kramer, Benjamin: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, *Arch. Path.* 27: 104 (Jan.) 1939.

3. The patients with high urinary calciums responded to an acid ash diet with an excessively increased urinary calcium as compared to the patients with low urinary calciums.

4. The patients with high urinary calcium responded to a moderate vitamin D intake with an excessively increased urinary excretion of calcium as compared to normal volunteers.

5. A study of the effect of pathologic changes in the kidney on the urinary excretion of calcium through that kidney was made in fourteen patients. A slight pathologic change was usually associated with definitely increased urinary calcium as compared with the normal mate; marked pathologic change was usually associated with definitely lowered urinary calcium as compared to the normal mate.

6. Increased fluid intake resulting in increased urinary output merely seemed to dilute the urine and thus reduce calcium concentration per unit volume. It did not alter significantly the total daily amount of calcium excreted.

7. Consequently, in the management of patients with urinary calculi it is important to consider not only such factors as vitamin A deficiency, infection of the urinary tract, hyperparathyroidism and stasis but also the quantitative urinary concentration of calcium and the quantitative influence on this concentration of any treatment instituted.

DO ALKALIS USED IN THE TREATMENT OF PEPTIC ULCER CAUSE KIDNEY STONES?

A STUDY OF 1,940 CASES

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AND

RALPH C. BROWN, M.D.

CHICAGO

The occurrence of urinary calculus in a patient who for a period of time has been taking alkalis in the treatment of peptic ulcer may arouse suspicion that the stone has formed as a result of the use of the alkalis. This idea appears to exist not only in the minds of the public but in the minds of some members of the medical profession as well.

The present study was undertaken with a view of securing data from which conclusions might be drawn as to the etiologic relationship, if any, between the use of alkalis in the treatment of peptic ulcer and kidney and ureteral stone formation.

The data that we present were obtained by an examination of the records of 2,210 cases, of which 1,260 cases were seen by one of us (H. L. K.) and 950 by the other (R. C. B.).

HISTORY

Calculus disease dates back to the very beginning of civilization. According to Joly,¹ the earliest specimen of a vesical stone was discovered by Prof. Elliott Smith in the grave of an Egyptian and was estimated to be about 7,000 years old. It was composed of a central nucleus of uric acid surrounded by a thick layer of

calcium oxalate and ammonium-magnesium phosphate. He also described another stone which was found lying close to the second lumbar vertebra of a skeleton in a tomb, dating from the second dynasty about 4100 B. C. It was composed of carbonate, phosphate and oxalate of lime. From its appearance and the position in which it was found it was supposed to be a renal calculus.

The chemical composition of these stones bears a striking resemblance to the composition of kidney and ureteral stones that occur today, and one may say that through the past 7,000 years there has been no great change in the chemical composition of these calculi.

Randall² has recently published the results of the chemical examinations of a large series of kidney and ureteral stones. Attention may be called to the large number of kidney stones that were composed of pure calcium-magnesium phosphate, thirty-nine of seventy-one, or 54 per cent. We wish also to direct attention to the fact that of 100 cases of stone in the ureter in which the stones occurred in pure salts, forty-nine of them consisted of pure calcium-magnesium phosphate.

Before entering into a discussion of the question of the possible relationship between the use of alkalis in the treatment of peptic ulcer and the formation of kidney stones, it might be well to present briefly the various theories as to the origin of these stones. At the outset it might be well to call attention to the statement of Hinman, who says "No more is known of what starts the mechanisms of formation of stone than of the mechanism itself." Attention may also be called to the statement of Howard Kelley: "No stretch of chemical or physiological imagination will permit so heterogeneous a group of compounds to be ascribed to a common origin, or their deposition, in kidney, ureter or bladder, to be uniformly charged to an identical cause."

Since the treatment of peptic ulcer is intimately associated with a definite dietary regimen, it might be well to state at the outset that all patients are on a program designed to exclude the possibility of vitamin deficiency, so that avitaminosis as a factor can be excluded.

Experimental studies have been presented demonstrating a relation between deficiency of vitamin A and the production of urinary calculi in animals. Contributions on this subject have been furnished by McCarrison,³ Fujimaki,⁴ van Leersum, Perlman, Higgins,⁵ Steiner, Zuger and Kramer⁶ and many others. They agree that the vitamin A deficiency is often the cause of urinary calculi in experimental animals.

Furthermore, attention may be called to the fact that the incidence of urinary stone in children, especially bladder stone, has almost disappeared since the institution of modern diets which prevent avitaminosis.

During the past ten years a good deal of attention has been given to disturbance in the function of the parathyroids. Although renal calculi are found in hyperparathyroidism, it is doubtful whether it plays a role in the production of renal calculi as seen in practice.

Albright, Baird, Cope and Bloomberg⁷ reported that 27 per cent of a series of eighty-three patients with hyperparathyroidism had renal calculi. On the other

2. Randall, Alexander: *Ann. Surg.* 105: 1009-1027 (June) 1937.

3. McCarrison, R.: *Brit. M. J.* 2: 159 (July 30) 1927.

4. Fujimaki: *League of Nations Health Organization*, Geneva, 1926, p. 369.

5. Higgins, C. C.: *Production and Solution of Urinary Calculi*, J. A. M. A. 104: 1296-1298 (April 13) 1935; *J. Urol.* 29: 157 (Feb.) 1933.

6. Steiner, Morris; Zuger, Bernard, and Kramer, Benjamin: *Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A*, *Arch. Path.* 27: 104 (Jan.) 1939.

7. Albright, Fuller; Baird, F. C.; Cope, Oliver, and Bloomberg, Esther, *J. Am. M. Sc.* 187: 49 (Jan.) 1934.

From the Presbyterian Hospital and the A. D. Thomson Fund, Rush Medical College, University of Chicago.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Joly, J. S.: *Stone and Calculous Disease of the Urinary Organs*, St. Louis, C. V. Mosby Company, 1929.

hand, Braasch, Griffin and Osterburg in a study of 1,206 consecutive cases of urolithiasis found hyperparathyroidism as an etiologic factor in less than 0.2 per cent.

Albright and Bloomberg⁸ concluded that formation of urinary calculus in hyperparathyroidism belongs to that etiologic group in which the predisposing abnormal factor is an excess of crystalloids in the urine.

Disturbance in the colloid-crystalloid balance as a cause of renal stone was proposed many years ago. It is based on the assumption that the urine is a supersaturated solution and that the crystalloids are held in solution because of the presence of protective colloids. Precipitation of crystalloids may occur if they are present in so excessive an amount that the normal colloid cannot hold them in solution or if they are present in normal amount and there is a diminished amount of colloids present.

Interesting in this connection is the fact that some patients have an excessive amount of crystalloids in the urine and yet stone never develops. As examples, cystinuria, oxaluria and phosphaturia may be mentioned.

The theory that interference with urinary drainage results in stasis and hence predisposes to stone is an old one. In cases of hydronephrosis with stone formation one is always confronted with the question of

types of treatment, such as Leube's and Leuhartz's, came into vogue, the employment of alkalis was a definite part of the regimen.

In 1914 Sippy proposed the use of acid neutralizing substances, chiefly alkalis and milk, to be taken with a frequency and in amounts sufficient to effect complete neutralization of the free hydrochloric acid in the gastric content from morning until night. The validity of the basic principle of the Sippy treatment, namely, freeing the exposed surface of the peptic ulcer from the tissue digesting action of the gastric juice by inhibiting its proteolytic action, as can be done by total neutralization of hydrochloric acid, has been well established in the intervening years.

As is true with most useful chemical therapeutic agents, alkalis must be used with a certain amount of discretion. Persons differ in their tolerance of various types of alkalis just as they differ in their tolerance of belladonna and other substances. In general, older persons tolerate them less well than the young and the middle aged. Many different alkaline substances have been employed, chiefly sodium bicarbonate, calcium carbonate, magnesium oxide and the tribasic phosphates of calcium and magnesium, and of these the latter three are apparently the least likely to cause an acid-base imbalance.

In the ulcer cases covered by this survey the group in the earlier years was treated with sodium bicarbonate and calcium carbonate. In the last ten years the tribasic phosphates of calcium and magnesium have been most commonly used in the treatment of ulcer at the Presbyterian Hospital. The amount required in the individual case is determined by aspiration of gastric contents and titration. The total daily amount of the tribasic phosphates used varies from 25 to 30 Gm. for periods varying from two to six months. If any symptoms indicative of disturbance of the acid-base ratio develop, the further use of alkaline salts is governed by estimation of the carbon dioxide of the blood plasma. Special attention is given to the vitamin requirements of these patients.

It has been claimed that the administration of alkalis in the treatment of peptic ulcer may cause certain disturbances in the calcium and inorganic phosphorus content in the blood serum. In order to determine whether or not there is any disturbance of the calcium phosphorus blood level, twenty-five cases of peptic ulcer under thorough alkalization were studied to determine the serum calcium and serum phosphorus content. The highest calcium figure was 12 mg. per hundred cubic centimeters, the lowest 9.3 mg. and the average 10.38 mg. The highest inorganic phosphorus content was 4.4 mg. per hundred cubic centimeters, the lowest 2.8 mg. and the average 3.65 mg. As the highest figures obtained are within the normal range and the averages are quite normal for both calcium and phosphorus, it would seem that the use of alkalis in ulcer treatment does not predispose to stone formation through elevation of blood serum calcium and phosphorus.

For the purpose of this investigation a detailed study of the records of 950 cases of peptic ulcer was made. These were taken from the files of the Presbyterian Hospital without selection but included a group of cases from each year from 1914 to 1937 inclusive.

A questionnaire was directed to this group of 950 patients, of whom 680 replied, and the data to be presented is based on the replies received from this group of 680 peptic ulcer patients who had had treatment for

TABLE 1.—Location of Stone in Seven Cases

Case	Age	Sex	Location of Stone
1	43	♀	Kidney
2	40	♂	Ureter
3	40	♂	Kidney and ureter
4	47	♂	Ureter
5	45	♂	Kidney
6	47	♂	Ureter
7	48	♂	Kidney

whether the stone made the hydronephrosis or vice versa. Although stasis may play a role in some cases, it can hardly be called on as a factor in the very large number of cases in which stasis is absent.

There can be no doubt that infection plays an important role in a certain number of cases. On the other hand, the large number of cases of stone without infection immediately raises the question of the role played by infection in each case. Furthermore, the common cause of renal infection is the colon bacillus; the largest number of infections are not associated with stone.

The recent work of Randall is extremely interesting in this connection. According to him, renal calculus formation is dependent on a preexisting renal lesion, and this lesion consists of the deposition of calcium in the walls and intertubular spaces of the renal papillae. He believes that these calcium plaques appear to be a natural reparative process to some form of tubular damage. He was able with seven specimens to show a calculus attached to the calcium plaque.

THE RATIONALE OF ULCER TREATMENT

The use of alkaline substances in the treatment of peptic ulcer is more ancient than our knowledge of the lesion. Long before Baillie's description of the morbid anatomy and symptoms of gastric ulcer in 1793 and Cruveilhier's classic work some years later, sufferers with ulcer had learned that relief from the gnawing pains of ulcer could be had by taking chalk, magnesium and sodium bicarbonate. When the early standard

8. Albright, Fuller, and Bloomberg, Esther: *Tr. Am. A. Genito-Urin. Surgeons* 27: 195, 1934.

periods of from three to six months, the average period of accurate treatment being four months in duration. Many of these patients reported that they took minor amounts of alkaline powders over a much longer period.

INCIDENCE OF RENAL AND URETERAL CALCULI IN
680 CASES OF PEPTIC ULCER TREATED WITH
MILK AND ALKALIS

An interesting fact that was brought out in this study is that twenty-one patients gave a history of urinary calculus before they presented themselves for diagnosis and treatment of peptic ulcer. By contrast, there were only thirty-three cases in which there was a history of urinary calculus that occurred sometime after the treatment of peptic ulcer was instituted.

In many of these cases symptoms of kidney stone developed from ten to twenty years after the treatment for ulcer had been discontinued. Furthermore, it must be borne in mind that a large proportion of this group of 680 ulcer cases had been treated from ten to twenty-five years prior to the period of this inquiry; hence in an evaluation of the data consideration must be given to the fact that in any such cross section of the population as represented by this group of 680 individuals—a majority of them now in middle or later life—a certain normal incidence of renal calculus is certain to exist.

Also in certain of these thirty-three cases of calculi occurring after ulcer treatment there may well have been an unrecognized, symptomless kidney stone at the time of institution of ulcer treatment, since the passing of stones within two months thereafter was reported in some cases. The spontaneous passage of a single small stone was reported in six of the thirty-three cases.

Summarizing the facts brought out by this study of 680 ulcer cases under treatment, there were twenty-one (3.1 per cent) in which stones occurred before ulcer treatment and thirty-three (4.9 per cent) in which stones occurred after ulcer treatment. Hence, even if the modifying factors previously mentioned (i. e., normal incidence of stone) are disregarded, it would seem that the case against alkalis as used in ulcer treatment as a cause of renal calculus narrows down to the difference between the 4.9 per cent of cases in which stone was reported after treatment and the 3.1 per cent of cases in which stones were reported before ulcer treatment, a difference of 1.8 per cent; not a grave indictment of the use of alkalis.

As an approach to this problem from the urologic point of view, the records of 1,260 cases were studied, supplemented by many personal interviews.

In this series of 1,260 cases of renal and ureteral calculi there were seven in which the diagnosis of stone and ulcer was made simultaneously and in which there had been no ulcer treatment. This group of cases is presented in table 1.

It is interesting to note that six of the seven cases occurred in men and that all seven cases occurred in the fourth decade.

Among the 1,260 cases were twenty-six in which there was a history of peptic ulcer, or 2.06 per cent. The age, sex, location of the stone and treatment carried out are given in table 2.

An analysis of this group shows that only fifteen patients, or 57.692 per cent, received alkalis for the treatment of ulcer. Seven of the remaining eleven patients, or 26.923 per cent, received surgical treatment. The operations performed were gastro-enterostomies and gastric resections. One of the patients had three

operations for ulcer, namely a gastro-enterostomy, a gastrojejunostomy and finally a resection. The remaining four patients, or 15.384 per cent, received no alkalis in the treatment for peptic ulcer.

Since some of the patients were treated elsewhere for ulcer, the thoroughness with which the treatment was carried out as far as the amount of alkalis used is concerned may be open to question.

We wish to call attention to the fact that, of the fifteen cases in which alkalis were given, in three the stones occurred many years after the ulcer treatment was discontinued. In one instance the stone developed fourteen years later, in another ten years and in the third case five years later.

Because of the long period that elapsed between the cessation of ulcer treatment and the onset of the urinary calculi, one may question the relationship, if any, between the two and state that the occurrence of the stones so many years later was purely incidental.

TABLE 2.—Location of Stone and Treatment in Twenty-Six Cases of Peptic Ulcer

Case	Age	Sex	Location	Treatment
1	54	♀	Ureter	Alkalis
2	59	♂	Kidney	Gastro-enterostomy only
3	38	♂	Kidney (bilateral)	Alkalis
4	57	♂	Kidney	No treatment
5	59	♂	Kidney	Alkalis
6	41	♀	Kidney	Resection, stomach
7	62	♂	Kidney	No alkalis, milk and cream only
8	67	♂	Kidney	Gastro-enterostomy
9	53	♂	Kidney	Laparotomy for ulcer
10	57	♂	Kidney	No alkalis, milk only
11	55	♂	Kidney	Gastro-enterostomy + treatment
12	44	♀	Kidney	Alkalis
13	73	♂	Kidney	Alkalis
14	47	♂	Kidney	Alkalis
15	61	♂	Kidney	Alkalis
16	54	♂	Kidney	Gastro-enterostomy
17	38	♂	Kidney	Alkalis
18	70	♂	Ureter	Alkalis
19	52	♂	Ureter	Alkalis
20	45	♀	Ureter	Alkalis
21	41	♂	Ureter	Alkalis
22	68	♂	Ureter	Alkalis
23	35	♂	Ureter	Alkalis
24	27	♂	Ureter	Three operations for ulcer of stomach
25	39	♂	Ureter	Alkalis
26	68	♂	Kidney and ureter	No alkalinization; soda once in a while

These stones were small and were passed by the patient or removed by cystoscopic manipulation.

It is interesting to note that some of the stones were pure uric acid, others were pure calcium oxalate and others were mixed.

Of this series of 1,260 cases of renal and ureteral calculi, a history of having taken alkalis in the treatment of peptic ulcer was obtained in only fifteen cases, or 1.2 per cent.

SUMMARY

1. In our present state of knowledge it is generally agreed that the specific cause of renal and ureteral stones is unknown, as is evidenced by the many theories that have been advanced.

2. The difference of 1.8 per cent in the incidence of stone formation between individuals who were given alkalis in the treatment of peptic ulcer and in those who were not is so insignificant as to make it improbable that alkalis used in the treatment of ulcer play a role in stone formation.

3. The incidence of 1.2 per cent of previous ulcer treatment in a series of 1,260 cases of kidney and

ureteral stone is small. Theoretically one might expect the alkalis used in the treatment of peptic ulcer to cause renal stones. The incidence of only 1.2 per cent of treated ulcer cases in a series of 1,260 renal and ureteral calculi, however, does not support this theory.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. HIGGINS, DR. FLOCKS AND
DRS. KRETSCHMER AND BROWN

DR. JOHN MORRISSEY, New York: Urinary stasis and infection have a most important part in the formation of renal calculi. Vitamin A deficiency must be reckoned with as a factor in the general deficiency aspect of the disease. Calcium precipitation in and about the tubules is found both experimentally and clinically in vitamin D poisoning and hypothyroidism. It has also been established that the South African Negro of the Bantu type does not form renal calculi. Nephrostomy, prolonged pelvic drainage and uretostomy, all relatively new procedures, have introduced important new factors into the problem of the patient that outparallel the advance made along purely experimental lines. Continued insistence on the question of urinary stone solution, on methods of prevention and on recurrence and other associated items are very fertile culture mediums for the disturbed mind of the patient with stone. There is nothing more fallacious than the belief that any drug, either directly or indirectly through acidification of the urine, will dissolve a stone in the body. I do not mean to minimize the importance of the fundamental principles set forth by Dr. Higgins or the important observations of these thirty-five cases by Dr. Flocks with calcium stones. I do think, however, that continued insistence on the importance of dietary factors, chemotherapy and food deficiencies from vitamins A to Z all combine to place and retain the patient, whose ailment is 100 per cent a surgical urologic problem, in the hands of those practitioners who would temporize, whose clinical perspective is not surgical, and whose relative ability to handle properly the varied features of a problem of this type are inadequate. Thorough recognition and study of the fundamental principles set before us this morning will enable us of ourselves to evaluate for the patient more thoroughly, intelligently and completely his stone problem in the light of modern scientific urologic research.

DR. ROY J. HOLMES, Miami, Fla.: I feel that the overwhelming majority of recurrent renal calculi are, in reality, false recurrences. When one considers that the incidence of recurrence has been reduced from 50 to 10 per cent during the past twenty years, it seems improbable that such a marked reduction could be accounted for in any other manner than by improved x-ray and surgical management. By this I do not intend to minimize the importance of recent work on true recurrence which has been so well brought out by Dr. Higgins. Urologists have not progressed to the point in management of the kidney that has been operated on to account for such reduction on the basis of control over the etiologic factors. In my series I found that, if the renal pelvis was excluded, 80 per cent of all recurrent calculi were confined to the lower calix. Joly found the proportion six to one. This is of great importance, since it means that either the lower calix is by far the greater stone-bearing area or else it constitutes a stagnant pool well situated to catch and retain small calculi from other portions of the kidney. The predominant picture is that of a moderate sized stone blocking the neck of the lower calix with several sandlike particles in the minor calices. I am willing to admit that, even with the x-ray and various types of suction, I approach the problem of removing every vestige of sand from the lower calix with considerable fear and trembling. Dr. Higgins, in recognition of this point, has spoken favorably of heminephrectomy in selected cases in which there is dilatation of the calix. I not only agree with this point but might add that recently I have resorted to what might be termed a conservative resection of the lower calix. This work has not progressed far enough to justify more than casual mention. I feel, however, that if by partial encirclement of the lower calix with mattress sutures we can remove that comparatively small portion which has proved itself a

habitual menace to the welfare of the entire kidney, we shall have gone far in correcting the problem of false recurrences. The study by Dr. Flocks of ureteral urine taken from each kidney at the same time is very interesting. It is apparent that a small stone in the kidney may, by partly obstructing the outflow of urine, establish a vicious circle in which the higher calcium concentration may serve to overwhelm further the protective colloids and lead to further agglutination of the crystalloids. The value of an intake of large quantities of water in cases of hypercalcemia has been emphasized. This is also the best treatment for combating urea-splitting organisms found in about 50 per cent of such urines.

DR. CHARLES C. HIGGINS, Cleveland: One presumption that has frequently been made in the literature and that has been referred to is the statement that when the patient has been on a diet containing adequate amounts of vitamin A there is no reason to believe that vitamin A deficiency is present. These deductions are fraught with error and I believe that roentgen biophotometer tests should be made in every patient with lithiasis. Dr. Sargent has asked the question: What is a logical routine do you use to prove complete removal of all stones? I believe that as a matter of routine a roentgenogram of exposed kidney should be secured at the time of the operation. This can be done very easily and I believe it is preferable to the use of the fluoroscope. The question has been asked as to whether or not a stone wave is occurring in the United States. In a review of the literature, I have found no evidence that calculous disease is increasing in frequency in this country. It has been noted by von Lichtenberg, Geza Illyes and others that following the World War there was a definite increase in calculous disease in certain parts of Europe. These men have stated that this was probably due to the fact that invading armies, not having adequate commissaries, were required to derive their food from the locality in which they were stationed; therefore the people in these communities were on a definitely deficient diet for extended periods of time. Obviously, other factors are associated with the formation of renal calculus. I have not seen the lesion of the papilla which Dr. Randall has described, although I have studied numerous kidneys which were removed because of calculous disease. Dr. Randall, however, has clearly shown the frequency of its occurrence. The question is asked as to whether this lesion is similar to that described by Dr. John Caulk in 1912. In 1912 Dr. Caulk described a lesion of the papilla on which there was a calcareous deposit which chemically was found to be composed of calcium phosphate, and later in 1926 Macgowan described a similar lesion.

DR. RALPH C. BROWN, Chicago: It is a satisfaction to an internist to discover that the urologists are about as much in the dark as to the etiology of kidney stone as internists are regarding the fundamental causes of peptic ulcer. There has been a fairly well defined idea that a marked increase in crystalloids in the urine predisposes to stone formation and internists who have occasion to treat many peptic ulcers have been subjected to a good deal of criticism from time to time because of the considerable amounts of alkaline substances used in ulcer treatment. As a matter of fact, we have never had precise information as to what happens with respect to calculus formation in individuals so treated. It was for the purpose of securing such information that Dr. Kretschmer and I undertook this study. On careful questioning of a large number of individuals who had been on ulcer management for from three or six months, some of them longer, it was interesting to find that the incidence of kidney stone after ulcer treatment with alkalis was only 1.8 per cent greater than it was before treatment. Even this small figure would probably vanish if one gave value to such a modifying factor as the normal probability of occurrence of stone in a large group of people who were replying to a questionnaire all the way from five to twenty years after they had been treated for gastric or duodenal ulcer. Furthermore, when Dr. Kretschmer finds that only 1.2 per cent of his very large series of patients with kidney stone gave a history of having been on peptic ulcer treatment at any time, one is forced to draw the conclusion that the use of alkalis in ulcer management has little or no influence in the causation of kidney

stones. It is interesting to bear in mind that there is being carried on a great public propaganda by magazine and radio advertising under the slogan "Keep Yourself On the Alkaline Side." If the use of alkalis really has much to do with this matter of stone formation, it would seem that during the next few years urologists should be called on to deal with a tremendous increase in the number of cases of renal calculus.

THE USE OF PLACENTAL BLOOD FOR TRANSFUSION

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AND

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For the past two years the medical profession has been extremely interested in blood banks. The casual reader would be led to believe that this work had been only recently developed. A carefully prepared bibliography, however, shows that the subject of blood banks was first described in 1918 by Oswald H. Robertson,¹ then of the United States Army. The experimental basis for his work was originated by Rous and Turner,² affiliated with the Rockefeller Institute for Medical Research. Dr. Robertson's¹ original article advocated the use of a preserving fluid consisting of 5.4 per cent dextrose combined with 3.8 per cent sodium citrate. In a personal communication dated October 1938, Dr. Robertson still favors this use of sugar and citrate as a preservative.

Rous and Turner² determined the viability of preserved blood cells by means of transfusion of these cells in bulk. Rabbits were used for this purpose. A normal rabbit was bled of a large quantity of blood, up to half its blood volume, causing a marked drop in the hemoglobin percentage and red cell count. Immediately afterward the rabbit was given a transfusion of an amount of preserved rabbit's blood equal to the amount lost in bleeding. The hemoglobin returned promptly to its previous level. The animal showed no ill effects from the procedure, and the hemoglobin and red blood cell count remained normal. This demonstrated that the transfused preserved blood cells were behaving as normal red corpuscles. By this means it was found that rabbit's blood could be kept living for two weeks. Many similar experiments were carried out with the same result.

Further study of the subject is illuminating, as in 1934 Lindenbaum and Stroikova³ reported on the various preserving fluids as studied at the Institute for Blood Transfusions in Moscow. The solutions studied were citrate, a mixture of citrate and physiologic solution of sodium chloride, a solution known as "IPK" and, finally, a dextrose-citrate solution. The Moscow workers concluded that "IPK" solution, sometimes referred to as the Moscow solution, was only slightly more efficacious than citrate and that the dextrose citrate solution was superior. They reported that hemolysis took place in approximately ten days with the citrate solution, in twelve days with "IPK" and in thirty-five days with the dextrose and citrate solution. They considered the dextrose as a nourishing medium

for erythrocytes while the other solutions represented only a culture of red blood corpuscles in their own plasma. Three objections were raised against the use of dextrose:

1. It represents a perfect medium for the growth of microorganisms.
2. Decomposition of dextrose in the preserving fluid leads to the formation of lactic acid.
3. Difficulties are encountered in sterilization.

This subject is not in its infancy; during the same year that the foregoing studies were made Balachovski and Guinsbourg⁴ experimented on the use of preserved blood, using an equal amount of diluent similar to "IPK" and blood, and Ascoli and Vercesi⁵ submitted from the gynecologic clinics of the University of Palermo, Italy, a comprehensive report on the use of placental blood in transfusions. The latter authors were of the opinion that placental blood was more efficacious than common blood and prophesied that cord blood would find a wide application in general hospitals.

In 1936 Novikova and Farberova⁶ wrote a concise and instructive treatise on the use of placental blood from the Institute for Blood Transfusions in Leningrad. The technic described had been in use by these authors since 1933. They noted that placental blood averaged from 90 to 100 per cent hemoglobin and had from 5 to 6 million erythrocytes; that there was a relatively large amount of bilirubin and a low cholesterol and albumin fraction of the blood, while the amount of globulin was increased; that the potassium and calcium contents were relatively large and that the large amount of copper present should form a great advantage over adults' blood. The authors admitted the disadvantage of the small yield from one cord but stated that this could be overcome by the fractional use of two or more and warned that the blood from each cord should be transfused separately to prevent reaction.

During the same year Stavskaya⁷ reported on the use of placental and retroplacental blood. He concluded that:

Placental blood is indicated chiefly when not substitution but stimulation therapy is required, for example: (1) in anemias, because the placental blood contains a large amount of hemoglobin, erythrocytes and bilirubin; the bone marrow is stimulated and plastic material for regeneration of erythrocytes furnished; (2) in hemorrhagic diathesis; in these cases placental blood is valuable because of its increased coagulability; (3) in shock.

Keller and Limpach⁸ in 1938 reported on the use of placental blood from the Strasbourg Lying-in Hospital. Their observations were similar to those of other workers mentioned previously. However, they did mention the beneficial results of the use of the blood against ray sickness after ultrapenetrating roentgen therapy.

The pioneer work in the use of placental blood for transfusions on this continent was done by Drs. Goodall and Anderson of Montreal and their co-workers.⁹ Dr.

From the Transfusion Service of the Massachusetts Memorial Hospitals.

1. Robertson, O. H.: Transfusion with Preserved Red Blood Cells, *Brit. M. J.* 1: 691 (June 22) 1918; personal communication to the authors.

2. Rous, Peyton, and Turner, J. R.: *J. Exper. Med.* 23: 219 (Feb.) 1916.

3. Lindenbaum, J., and Stroikova, X.: Laboratory Studies on Conditions Under Which Hemolysis Occurs in Preserved Blood, *Deutsche Ztschr. f. Chir.* 243: 727, 1934.

4. Balachovski, S., and Guinsbourg, F.: The Transfusion of Preserved Blood, *Sang* 8: 622, 1934.

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8. Keller, R., and Limpach, J.: Transfusion of Placental Blood Before and After Operations, as Used in the Strasbourg Lying-in Hospital, *Bull. Soc. d'obst. et de gynec.* 27: 160 (Feb.) 1938.

9. Goodall, J. R.; Anderson, F. O.; Altman, G. T., and MacPhail, F. L.: An Inexhaustible Source of Blood for Transfusion and Its Preservation: Preliminary Report, *Surg., Gynec. & Obst.* 66: 176 (Feb.) 1938.

Goodall not only brought to our attention the availability of placental blood for transfusions but also contributed a workable technic for the collection of the blood and its preservation. Dr. Goodall is an advocate of the "IPK" solution as proposed by the Moscow Institute of Hematology.

In March 1938 our hospital instituted a placental blood bank. The technic adopted was that set forth by Dr. Goodall.⁹ Modifications of this technic have been made and laboratory studies carried out. We have attempted to answer the following questions: 1. Is the blood clean? 2. What is the best preservative? 3. What is the life of the blood? 4. Is the blood of use clinically and if so under what conditions?

Our attempt to modify Dr. Goodall's technic has been (1) to establish a more aseptic technic of collection, (2) to reduce the percentage of reactions and (3) to simplify the securing of a sample of blood for direct typing.

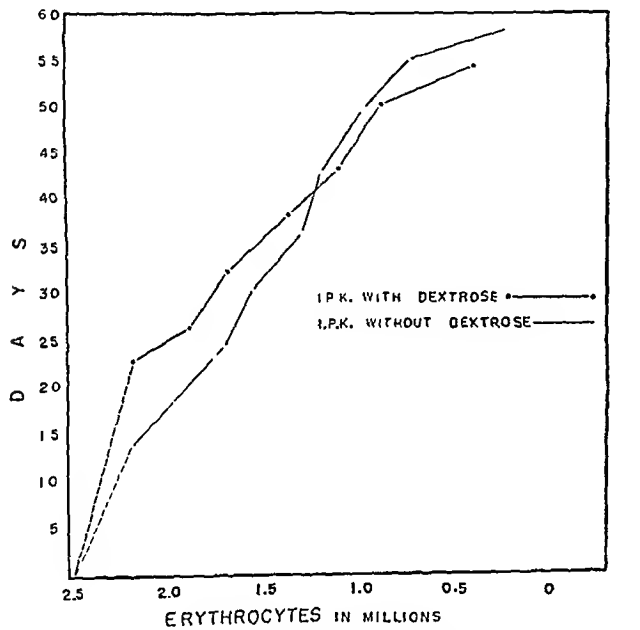


Fig. 1.—Average degree of hemolysis of ten placental blood banks with "IPK" and dextrose.

PROBLEMS

1. *Is the Blood Clean?*—With every collection of blood that is to be preserved for transfusion there has been an inoculation of sterile broth. The broth is incubated for from five to seven days. A culture is then transplanted on plates to determine what organism, if any, is present. The technic of securing the blood has improved to such an extent that at present it is only in a rare case that it needs to be discarded. We contemplate omitting the incubation of the plates and relying entirely on the examination of the broth, the flask corresponding to the culture that is turbid being discarded. Dr. Goodall⁹ is of the opinion that any infection becomes so attenuated that it is innocuous after standing in the ice chest. Our technic, however, is extremely simple and we would rather be on the safe side.

2. *What Is the Best Preservative?*—When we began our study of placental blood we used the "IPK" solution advocated by Dr. Goodall.⁹ Specimens were collected in flasks and sent to the laboratory. These

flasks were unopened until hemolysis was observed. The average length of time before hemolysis set in was 14.4 days. Hemolysis was completed in these flasks in anywhere from forty-two to ninety-one days. Following the recommendations of Robertson¹ and of Lindenbaum and Stroikova,³ we began using "IPK" and 5 per cent dextrose. In this series the hemolysis did not begin for 22.3 days. This change in preservative increased the availability of the blood by eight days. We recommend the use of this solution. Because of the technical difficulties of the ice chest, there was undue agitation of the flasks, which gave us our figure of 22.3 days. We are confident that a series of blood specimens now being studied will show an even more delayed hemolysis.

3. *The Life of the Blood.*—We have taken blood counts on the day of collection of a specimen submitted. A blood count is repeated on the same specimen on the day when hemolysis is first noticed. When we first began our study we counted the cells every day from the day of collection. We found that this is not practical, as the agitation caused by securing

TABLE 1.—Blood Count Just Previous to and Four Days Following Transfusion

Condition	Red Blood Cells	Hemoglobin, per Cent
Anemia of the newborn.....	3,250,000-3,920,000	73-87
Malnutrition.....	3,100,000-4,100,000	72-80
Vomiting and diarrhea.....	3,700,000-4,300,000	50-63
Postoperative perineal prostatectomy..	2,750,000-2,800,000	50-52
Carcinoma of the colon.....	3,450,000-3,700,000	60-66
Obstructing prostate.....	2,850,000-3,150,000	60-60
Obstructing prostate.....	3,000,000-3,550,000	50-50
Duodenal ulcer.....	3,120,000-3,300,000	63-67

the blood resulted in early hemolysis. We have proved to ourselves that the decrease in cell count between these dates runs from 5,000 to 300,000, but as hemolysis increases the red cell count decreases. To interpret this finding in a practicable sense, flasks are usable until the twenty-second day when the "IPK" and the dextrose solution are used as preservative. At this time it is wise to discard them. However, in necessity these flasks may be used until hemolysis is well progressed; it must be realized of course that their efficacy has decreased in comparison to the amount of hemolysis. Since we discarded all flasks on the twenty-second day, no reactions have occurred during transfusion.

Figure 1 shows diagrammatically the advantage of dextrose and "IPK" as a preservative over "IPK" alone. Not only does hemolysis take place eight days later but blood counts taken of the solution every four days following the onset of hemolysis reveals blood destruction carried on at a slower rate in blood preserved with the combined solution.

This chart represents an average of ten specimens of blood in which "IPK" was used alone as a preservative and ten in which "IPK" and dextrose were used. To interpret the curve, it is necessary to accept 5 million as the average cell count of placental blood. The blood is diluted one half, with preservative leaving 2,500,000 as an initial factor.

4. *Is the Blood of Use Clinically, and If So Under What Conditions?*—We have used the bloods in the following conditions. These are picked at random: malnutrition, secondary anemia, postpartum hemorrhage, cholecystogastrostomy, pyloric obstruction, carcinoma of the sigmoid, duodenal ulcer (gastrectomy), splenic anemia, carcinoma at the head of the pancreas

(jaundice), obstructing prostate, vomiting and diarrhea, erythroblastosis, papilloma of the bladder and carcinoma of the stomach.

We have made sixty-four transfusions, using seventy-eight flasks. This has been accomplished without a serious reaction and no fatalities.

While carrying out this study, we have compared the blood count just previous to transfusion to the blood count four days following transfusion, with the results given in table 1.

TABLE 2.—The Number of Cases and Percentage of Incidence in Each Blood Type of the 120 Cases in Which Both Maternal and Placental Bloods Were Alike

Total		O		A		B		AB	
Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
120	100.0	64	53.3	41	34.2	11	9.2	4	3.3

The interpretation of our results would lead us to agree with Stavskaya's⁷ report that the blood is of more use in stimulation therapy than in substitution. We are studying the effect of placental blood on the reticulocyte count but our data at present are not sufficient to warrant a conclusion.

TECHNIC

1. *Establish a More Aseptic Technic of Collection.*—To prevent contamination, Dr. Goodall⁹ suggested that a sterile towel with a hole in the center be applied

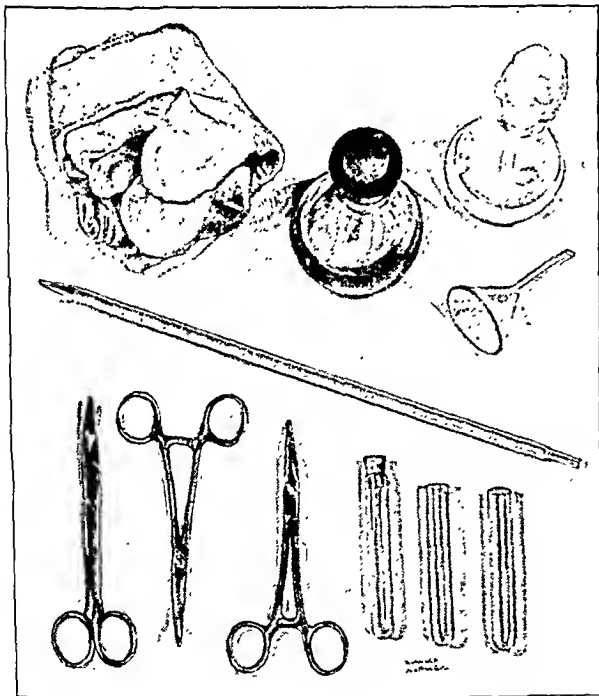


Fig. 2.—Table prepared for the collection of placental blood.

to the surgeon's gown. We have modified this technic by using large sterile cloth mittens that are slipped on over the surgeon's gloves and wrists, thereby preventing contamination when handling the cord.

2. *Reduce the Percentage of Reactions.*—Since 1934 all the intravenous solutions of dextrose and sodium chloride have been manufactured in our hospital under the supervision of the intravenous service.

Agreeing with Dr. Florence Seibert¹⁰ that pyrogens are the cause of most of the reactions when intravenous fluids are used, and realizing that pyrogens multiply when exposed to the air, we have preserved our blood and its diluting fluid in air-tight flasks, using stazon

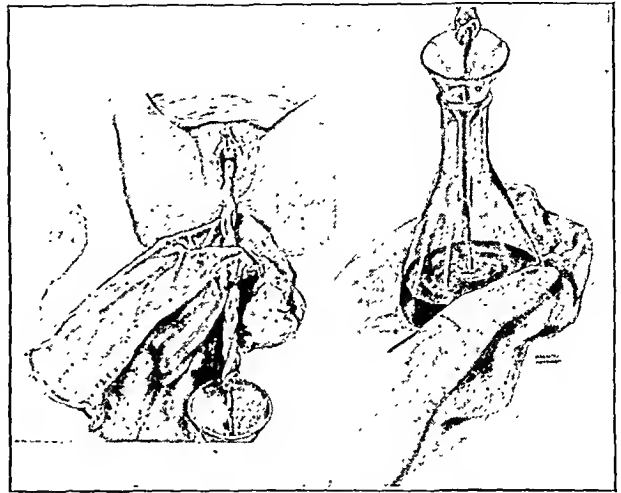


Fig. 3.—Use of the sterile mittens in collecting placental blood.

rubber stoppers instead of the familiar gauze stoppers. Reactions are also avoided if the blood is used for transfusion before hemolysis takes place. Our percentage of transfusion reactions is 4.6. This statement may be modified to the extent that since the establishment of the following technic no reactions have occurred: (1) fractional transfusions of more than one flask, (2) the use of blood before the twenty-second day and (3) the use of air-tight containers.

3. *Simplifying the Securing of a Sample of Blood for Direct Typing.*—Our experimental work and the work of others show conclusively that any disturbance of the blood while in storage hastens hemolysis. Knowing by the label that a certain flask is of a certain

TABLE 3.—Placental Blood Types in Entire Series

Maternal Blood Type	O		A		B		AB	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
O	64	35.8	25	14.0	4	2.2	..	....
A	13	7.3	41	22.9	2	1.1	2	1.1
B	6	3.4	2	1.1	11	6.1	3	1.7
AB	..	....	..	....	2	1.1	4	2.2

type is not sufficient reason to use that flask for transfusion. A direct typing must be done. If a flask is to be uncorked and a sample obtained with a pipet and found to be incompatible, this flask will hemolyze much sooner than an unopened flask. To make it unnecessary to disturb the blood, a pilot tube is attached to the outside of the flask. This tube contains a specimen of the blood and diluting fluid. Whenever transfusion is contemplated with this flask, a sample of the blood in the tube is removed for direct typing, and if it is found incompatible the blood has not been disturbed.

PLACENTAL AND MATERNAL BLOOD GROUPING

There were 179 cases in which the type of blood in both maternal and placental blood was determined. An analysis of these blood groupings revealed some very interesting data.

10. Seibert, Florence B.: Cause of Many Febrile Reactions Following Intravenous Injections, *Am. J. Physiol.* 71: 621-651 (Feb.) 1925.

In 120 cases, or 67 per cent of the total series, the maternal and placental bloods were of the same type. These 120 cases were further subdivided with the results seen in table 2.

Table 3 shows the relative incidence and percentage of incidence of the various combinations of blood groupings found between the maternal and placental bloods in the entire series of 179 cases.

TABLE 4.—*Placental Blood Type of Ninety-Three Cases in Which Maternal Blood Type Was O*

Placental Blood Type							
O		A		B		AB	
Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
64	68.8	25	26.9	4	4.3	..	....
Total		Total		Total		Total	
64	68.8	25	26.9	4	4.3	..	....

TABLE 5.—*Placental Blood Type of Fifty-Eight Cases in Which the Maternal Blood Type Was A*

Placental Blood Type							
O		A		B		AB	
Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
13	22.5	41	70.7	2	3.4	2	3.4
Total		Total		Total		Total	
13	22.5	41	70.7	2	3.4	2	3.4

Tables 4, 5, 6 and 7 show the breakdown of the cases by maternal blood groupings.

DESCRIPTION OF TECHNIC

Into a 300 cc. Erlenmeyer flask is placed 12.5 cc. of 50 per cent dextrose solution. To this is added, by weight, 100 cc. of freshly distilled water and the contents of an ampule of citro-seroid¹¹ (25 cc.). The formula of citro-seroid is sodium citrate 5 Gm., sodium chloride 7 Gm., potassium chloride 0.2 Gm., magnesium sulfate 0.04 Gm. and distilled water 1,000 cc. In Lindenbaum and Stroikova's³ original article this formula is referred to as "IPK." A stazon rubber stopper is loosely placed in the neck of the flask. The flask is wrapped and autoclaved. While the contents of the flask are cooling the stopper is inserted in the neck of the flask without the wrapping being removed. This allows the exterior of the flask to remain sterile.

The setup for the collection of the blood includes a flask containing the preservative, a pair of sterile mittens, a funnel, three small test tubes, a bottle of broth, a pipet, two Kelly clamps and a pair of scissors. Following delivery the cord is prepared with iodine, two clamps are applied and the cord is cut between the clamps. The gloved hands are now covered with a pair of sterile mittens. The cord is again sharply cut proximal to the clamp. The end of the cord is pointed downward and the blood collected in the flask through a funnel. The cord may be milked to add to the yield.

As the flow diminishes, blood is collected in two small test tubes, one for a Wassermann test and one for typing. The flask is slightly agitated and 10 cc. of the solution is obtained with a sterile pipet. One half of the content is used to inoculate the broth for a check on contamination; the other half is placed in the third tube and stoppered with a cork stopper. The stoppered test tube containing a mixture of the blood

and solution is attached to the flask with elastic bands. The flask is sealed air tight with a stopper and is not to be reopened until it is to be used for transfusion. The stoppered tube containing the mixture of blood and preservative is known as the pilot tube.

A tag is attached to the flask. On this tag is recorded the name of the patient, the collection number and the date and a space for type, Wassermann reaction and culture report. The flask is then placed on the lower shelf of the refrigerator and kept at a temperature of 38 F. When the blood has been typed and the Wassermann reaction and culture reported negative, these data are placed on the tag and the flask is placed on the shelf above ready for use.

Placental blood may be collected on cesarean section. In these cases there is no chance of contamination. The only variation from the technic used in normal delivery is that the blood collected for the Wassermann test and typing is obtained after the placenta has been delivered.

When transfusion is contemplated, a flask of suitable type is chosen. A sample of the blood in the pilot tube is removed for direct typing. Usually two or three flasks are used for a single transfusion. These flasks are warmed in a bath and a continuous intravenous injection of physiologic solution of sodium chloride is started with an open Kelly bottle. A funnel is placed in the neck of the bottle with a gauze strainer and the contents of one flask are poured into the bottle.

The average yield of a flask is 100 cc. of blood. If a larger amount of blood is desired it may be added in a fractional manner, each flask added separately with a small amount of saline solution intervening between the contents of the flasks. Reactions may follow if contents of two or more flasks are added together.

TABLE 6.—*Placental Blood Type of Twenty-Two Cases in Which the Maternal Blood Type Was B*

Placental Blood Type							
O		A		B		AB	
Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
6	27.3	2	9.1	11	50.0	3	13.6
Total		Total		Total		Total	
6	27.3	2	9.1	11	50.0	3	13.6

TABLE 7.—*Placental Blood Type of Six Cases in Which the Maternal Blood Type Was AB*

Placental Blood Type							
O		A		B		AB	
Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
..	2	33.3	4	66.7
Total		Total		Total		Total	
..	2	33.3	4	66.7

SUMMARY AND CONCLUSION

From our experience with a placental blood bank which was inaugurated one year ago, we favor dextrose and "IPK" as a preservative. We believe that the percentage of reactions during a transfusion need not be higher than a whole blood transfusion (1) if the blood is used before hemolysis sets in, (2) if the blood is used in a fractional manner and (3) if the containers are kept air tight. We also believe that the blood is safe, economical and efficacious.

29 Bay State Road.

11. Ayerst, McKenna & Harrison.

ADMINISTRATIVE PROBLEMS IN CON-
NECTION WITH PSITTACOSIS

AND THE IMPORTATION OF AUSTRALIAN PARROTS

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On Jan. 24, 1939, a shipment of fifty-five Australian parrots arrived at the port of San Francisco on the *S. S. Monterey* of the Oceanic Steamship Company. The cargo had been en route from Queensland, Australia, and was intended for exhibition at the Australian Building during the Golden Gate International Exposition. The birds had been obtained from an aviary in Queensland and sixty-two were apparently healthy at the time they left the port of origin. En route seven, mostly King parrots, died. On arrival, the shipment passed through quarantine and was isolated on January 25 contrary to the usual custom at the Australian Pavilion on Treasure Island, which was declared a quarantine area by the United States Public Health Service. The collection of psittacine birds was inspected by the representatives of the United States Public Health Service and the State Department of Agriculture. According to a statement from the representative of the Department of Agriculture, the parrots were "in good health." Notwithstanding three days after arrival ten dead birds (two King parrots [*Alisterus*], three Crimson parrots [*Platyercus*], two cockatoos, one Blue-Cheeked parrot, one Yellow-Mantled parrot and one Blood-Stained cockatoo) were delivered to the George Williams Hooper Foundation, University of California, in accordance with an agreement between the foundation and the Surgeon General, United States Public Health Service, which requires the examination of all dead psittacine birds of importations held in quarantine in the ports of San Pedro and San Francisco. Gross examination of the cadavers revealed general emaciation, moderate to severe hemorrhagic enteritis, and small and pale spleens.

According to subsequent reports, the cages had been held outside the exposition buildings during a rainy night of January 25. The deaths of the nine parrots were attributed to exposure. One bird, found dead on arrival at the port of San Francisco, was included in the delivery made at the laboratory of the Hooper Foundation. Although the usual markings of psittacosis were absent, the organs were injected into mice. Within five days some of the mice died with lesions and microscopic appearances suggestive of psittacosis. Ultimately the virus was demonstrated in nine of the ten birds. On February 1 one dead King parrot and one Blood-Stained cockatoo in an advanced state of decomposition were submitted for examination; the King parrot was emaciated and the enlarged spleen contained the virus of psittacosis. The cause of death of the cockatoo was not determined. On February 13 these observations were reported to the representative of the United States Public Health Service and to the Director of Public Health of San Francisco, who had not been advised of the arrival of the shipment despite the fact that the sanitation of Treasure Island is entirely

under his jurisdiction. Investigation conducted by the San Francisco health department on February 14 disclosed the fact that the parrots were still housed in the Australian Building and that the caretaker considered the quarantine to have expired on February 7 and 8. A check-up by the representative of the San Francisco Department of Public Health revealed that ten birds were missing. On inquiry it was found that the parrots had died, and since it was presumed that the quarantine had been lifted it was not deemed necessary to send the cadavers to any laboratory for examination. In fact, they were buried in the rear of the building. Apparently, the representative of the Australian exhibit had not been advised that the quarantine period invariably extends fifteen days from the date of the last death. Since the last bird had died on February 1 the quarantine would still have been in force on February 14 and the cause of death of the ten birds which succumbed between February 8 and February 14, in all probability to psittacosis, would have been definitely established. At the time the San Francisco health department made the inspection, thirty-one live and one dead King parrots were found. The director of public health of San Francisco requested the immediate removal of the thirty-one parrots to the Angel Island Quarantine Station.

The King parrot found dead on February 13 was examined the next day and presented the lesions of acute psittacosis with extensive necrosis in the liver. On direct examination the exudate covering the pericardium was teeming with elementary bodies. Epidemiologically, this observation amply confirmed previous observations that improper care and exposure activate the latent virus in carriers so frequently present among imported parrots, and acute infections may follow within two to three weeks among the cage mates. The systematic investigations of Burnet¹ on psittacosis in wild Australian parrots in 1935 fail to mention the King parrot (*Alisterus* or *Aprosmictus scapularis*). However, in a more recent report by Burnet² (1939), notable deaths among this species in the wild state in various sections of Australia attest its susceptibility. The experiences with the Australian shipment indicate that the King parrot may have escaped nest infection and thus proved highly susceptible as an adult. The majority of the psittacine birds which died en route belonged to this species. It is reasonable to suspect that they became infected by exposure to the carriers which were in the shipment.

On February 18 a Sulphur-Crested cockatoo was found dead with the gross lesions of pneumonia and enteritis; no virus was found.

A close clinical examination of the remaining thirty-one psittacine birds at Angel Island left the impression with a group of investigators who are familiar with bird diseases that, with the exception of a King parrot, a Blood-Stained cockatoo, a Crimson parrot and a quarrion, the shipment consisted of apparently healthy specimens. However, in the light of past experiences it was fully realized that a fair percentage of the parrots were carriers. Under the ideal conditions of housing in separate cages and uniform temperature there was little likelihood that further deaths would occur. In fact, between February 15 and March 1 the sick birds greatly improved and without a previous history

From the Department of Public Health, San Francisco (Geiger and Crowley) and the Hooper Foundation for Medical Research, University of California (Meyer and Eddie).

1. Burnet, F. M.: Psittacosis in Wild Australian Parrots, *J. Hyg.* 35: 412 (Aug.) 1935.

2. Burnet, F. M.: Psittacosis in Wild Australian Parrots, M. J. Australia, to be published; Psittacosis in Australia, Sixth Pacific Congress, to be published.

of the shipment or laboratory observations the parrots would doubtless have been released. To permit the exhibit of survivors of a consignment of parrots in which deaths have occurred would, however, have meant courting disaster. Recent experiences in the London zoo amply attest such possibilities. In order to exhaust every means to decide the fate of the shipment and to test some newer diagnostic methods, it was decided to bleed the thirty-one parrots and to subject their blood serum to complement fixation tests with the psittacosis antigen. At the time of the bleeding on March 1 the sick King parrot and one quarrion were killed and the autopsy of both revealed residuals of a psittacosis infection with positive virus. The serum tests yielded a fairly large percentage of positive or suggestive reactions with the psittacosis antigen. The director of public health of San Francisco therefore refused the admission of the shipment to Treasure Island. On March 9 the remaining twenty-nine "healthy parrots" were bled to death and examined. One carrier was found among the corellas (*Kakatoe sanguinea*); one of the quarrions (*Nymphicus hollandicus*) and three of the Sulphur-Crested cockatoos (*Kakatoe galerita*) harbored the psittacosis virus in the enlarged spleens and livers.

COMMENT

The experiences collected in connection with the importation of Australian parrots for exhibition purposes to the American continent amply confirm similar observations previously reported by Levinthal³ in 1935 in England and the studies of Burnet² on native birds collected in the forests of Queensland, Brisbane and Victoria. Since spontaneous psittacosis is widely distributed in the psittacine birds of the Australian archipelago, the risk of reintroducing this malady into aviaries of other countries is great. Ornithologists and inspectors should by this time appreciate the fundamental fact that a clinical examination is utterly useless in judging the state of health of a shipment of parrots. Laboratory examinations by properly qualified and experienced workers are paramount in deciding the admission of a consignment. Such examinations are particularly indicated when the past history of the shipment reports fatalities en route. Unfortunately this type of information is not always available since the shipment is not accompanied by a reliable caretaker. The shipping companies have paid little or no attention to these dangerous consignments. How many passengers have been exposed to the risk of psittacosis by these careless methods of transportation remains unknown. Fortunately, only two persons came in contact with the shipment under discussion. One of the men developed a severe "influenza"; unfortunately, he refused a complement fixation test and consequently the exact nature of his illness presents an unsolved and intriguing problem, since psittacosis is suspected.

From an administrative point of view the handling of the importations left a great deal to be desired. The parrots were not quarantined in an area specially reserved for purposes of this kind but were housed on an exhibition ground at a time when a great many working men could have readily been exposed to the contagion. There was no supervision by the authority entrusted with the maintenance of the quarantine. The collection and the transmission of the dead birds were left to the discretion of a caretaker. It is to his credit that he did the work well and carried out instructions

implicitly. Doubtless he could have contracted psittacosis, and one wonders who would have assumed the responsibility for this illness, since this work was done under the instructions from the federal authorities; but his maintenance was paid by the consignee.

On numerous occasions, attention has been called to the inadequacy of the present quarantine regulations governing the importation of psittacine birds. A period of fourteen days is rarely sufficient to complete the mouse inoculation tests required to prove the presence or absence of the virus in the organs. Present and past experience has shown that acute psittacosis infections frequently develop during the quarantine period or shortly thereafter. Apparently healthy birds are released to the importer or dealer, who in turn promptly sells them to the public. Recently a Panama parrot was returned to a bird shop. Examination disclosed acute psittacosis and the significant fact that the bird had been released from quarantine two weeks before. The present regulations doubtless have protected the United States from widespread outbreaks of the character observed in 1929-1930. However, there is ample evidence to connect the South American and Mexican importations with human infections in California, New York and Oregon. Moreover, it is not unlikely that these shipments may have contributed to the maintenance of psittacosis in bird shops and aviaries of the United States.

In order to be effective, the period of quarantine should be extended to not less than three months, preferably six months. Finally, to derive the full measure of benefit from such a measure, the freedom of the importation from disease should be determined by laboratory tests. For larger parrots the blood serum complement fixation test done by an experienced laboratory may be valuable, since sufficient blood may be readily collected from one of the wing veins. One should, however, weigh judiciously the risk to which the person holding the parrots during the act of bleeding may be exposed. The three psittacosis infections in laboratory personnel reported from Germany by Haagen and Krückeberg⁴ in connection with the organization of control measures amply attest the probable dangers. Since the large and expensive parrots are usually held separately, the cages may be covered with dampened cloths while putting the birds under anesthesia; thus the dispersion of the virus particles adherent to feathers into the air may be reduced to a minimum. In any event, it is advisable to employ, if in any way practicable, those who have had psittacosis or whose serum tests would indicate resistance to the infection.

Shipments of parrotlets or smaller psittacine birds should be treated in a manner similar to those of parrakeets. A sample of from 10 to 20 per cent of the importations should be killed and examined post mortem, and the organs tested for virus by mouse inoculations. Occasionally the virus is weak and repeated passages extending over several weeks may be required to demonstrate it conclusively.

The various procedures just outlined will furnish reasonably dependable information relative to the existence of psittacosis in a consignment. Parrots whose blood serum gives positive complement fixation reactions may or may not be carriers or shedders of the virus. However, there is no reasonable doubt that they have had contact with the psittacosis virus. Psittacine birds with enlarged spleens which are bacteriologically sterile

3. Levinthal, W.: Recent Observations on Psittacosis, *Lancet* 1:1207 (May 25) 1935.

4. Haagen, E., and Krückeberg, V.: Veröffentlich. n. d. Geb. d. Vögelgesundheit, 48: 381, 1937.

on lifeless mediums but yield no virus on mouse passage tests must be considered very suggestive of psittacosis. The shipment may harbor a few carriers which may, under adverse environmental conditions, suffer from relapses and may become dangerous shedders. On the other hand, the absence of anatomic signs coupled with the absence of deaths among the parrots during the prolonged period of observations gives reasonable assurance that active psittacosis is in all probability not present in the importation. While in quarantine, cages with riccbirds (*Padda oryzivora*) should be suitably distributed throughout the rooms or building to test for the contamination of the air with virus which originates from the desiccated excreta of carriers or casks.

The procedures outlined will ultimately confront the health officer with important decisions. It may be necessary to rule that any consignment of parrots or parrakeets must be destroyed if active psittacosis infection is proved or even suspected. Any other procedure, in particular the release of survivors of a group in which deaths have occurred, is incompatible with sound public health practice. Doubtless, the health officer will be confronted with the accusation of ruthless slaughter. In case the shipments consist of parrakeets and parrotlets, he should remain adamant in his decision. On the other hand, as an alternative there may be permitted the periodic blood testing of the large and expensive parrots. Should the tests reveal no new infections over a period of six months, there may be safely transmitted the healthy birds selected from an infected shipment to the importer. The disadvantages of the latter procedure are largely economic, and until means have been found to defray the costs of the tests and those of an extended quarantine it is doubtful whether the bird dealers are prepared to risk importation of tropical birds. Thus the trade in psittacine birds and with it the danger of psittacosis would be enormously reduced. There remains, however, another source of trouble—importations to zoological gardens. It would doubtless be disastrous to prohibit or to curtail the exhibit of psittacine birds in these institutions, which are of great educational value. Fully cognizant of its paramount importance to society, the British Ministry of Health has exempted the consignments of birds of the parrot family for zoological gardens from the regulations which govern the importations to Great Britain. Recent experiences in London⁵ have prompted the Zoological Society to impose a three months quarantine on all newly acquired parrots arriving at the zoological gardens. Precautionary measures have been adopted to protect the personnel supervising the birds while in quarantine and to dispose of the excreta in a sanitary manner. The wearing of rubber gloves, masks and goggles by the attendants looking after the birds is mandatory. Similar steps should be taken in the United States. In fact, if and when the directors of the zoological gardens agree to a three to six months quarantine in approved buildings and under expert supervision, the federal authorities and the local health officer may grant permission to admit psittacine birds to zoological gardens without previous isolation at the port of entry.

Only too often the health official has to meet arguments propounded by representatives of the bird trade that human infections due to exposure of imported

psittacine birds are rare. In this connection it is important to emphasize that the course of the disease is by no means characteristic and is more readily camouflaged by the diagnosis of influenza. Moreover, individuals showing no clinical signs of illness may, none the less, be infected. With the aid of the complement fixation test, these silent infections may be detected. It is doubtless good public health practice to insist on a blood examination of persons who have been exposed to a consignment of diseased parrots.

Evidence produced in this report leaves no doubt that the trade in wild parrots and cockatoos introduces new problems in the control of psittacosis and makes it doubtless expedient to take protective measures.

PELLAGRA IN INFANCY AND CHILDHOOD

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During the past four years we have been studying the natural course of the development of pellagra in an area in which the disease is endemic. The habitual environment and dietary of more than 800 pellagrins in the Nutrition Clinic of the Hillman Hospital, Birmingham, Ala., have been studied. Since it seemed likely that each member of the household would be subjected to the same type of diet as the patient, we extended our studies to include the families of these pellagrins. Accordingly, the nutritional status of each member of the household was ascertained and we found that from one to six persons, including infants and children, showed evidence of pellagra. (It is interesting to note that blacktongue, a canine analogue of pellagra, was found in the dogs fed scraps of the food eaten by these families.) A diagnosis of pellagra was made in 194 children and in six infants, and in each case the diagnosis was confirmed by therapeutic tests. These studies are still in progress, but certain points concerning the manifestations of pellagra in infancy and early childhood have been clarified and form the basis of the present communication.

The children of pellagrous parents have been examined repeatedly, with particular attention directed toward the diet of the mother during pregnancy and lactation and of the child since birth, toward the physical and mental development of the child, and toward the presence or absence of lesions diagnostic of pellagra.

A careful history of the mother often revealed that her diet during pregnancy and lactation was inadequate and that, as a result, the quality of her breast milk was probably poor and the supply often insufficient for the child's needs. The nursing infants, therefore, had to be weaned soon after birth and were given some sort of food, which in many cases was inadequate for their nutritional needs. As they grew older, the majority of these children had poor appetites and usually ate very irregularly. Most of them preferred carbohydrate foods and often refused most of the other foods offered.

5. Troup, A. G.; Adam, Robert, and Bedson, S. T.: Outbreak of Psittacosis in the London Zoological Gardens, *Brit. M. J.* 1: 51 (Jan. 14) 1939.

From the Department of Medicine of the Cincinnati General Hospital, Cincinnati, and the Hillman Hospital, Birmingham, Ala. This investigation was aided by grants to the University of Cincinnati College of Medicine from the Rockefeller Foundation, the John and Mary R. Markle Foundation and Mead Johnson & Co.

The parents seldom attempted to change the food habits of the children, even if a good diet was made available. Analysis of the dietaries of such children shows that in most cases their diets were unbalanced and failed to supply in adequate amounts the foods essential for proper nutrition.

These children usually are underweight and underdeveloped for their age and appear to be undernourished and in ill health. Their parents state that they are irritable, easily frightened and "fretful" and that they cry a great deal. They are listless, tired and apprehensive and they do not manifest the normal interests of childhood. Those of school age find it difficult to concentrate and as a rule have made poor progress in school. Although the children seem too tired to play, they cannot rest. They do not sleep well at night but instead toss about and frequently awake crying. Many of them complain of soreness of the tongue and lips and of burning and pain in the stomach. Usually they suffer from constipation but they may have occasional attacks of diarrhea during the spring and summer months.

The response of infants and children to antipellagria therapy is as dramatic as it is in adults. The administration of nicotinic acid or yeast is followed by rapid improvement, and recent studies have shown that similar improvement follows the administration of monocarboxylic and dicarboxylic acids of pyrazine.¹ The preparation and use of these two chemical compounds have recently been described by one of us.² The total daily dosage of nicotinic acid and of the monocarboxylic and dicarboxylic acids of pyrazine is from 50 to 300 mg. We suggest 10 mg. tablets of nicotinic acid for children up to 6 years of age and 20 mg. tablets from 6 years of age up to puberty. They should be given not less than one hour apart. The monocarboxylic or dicarboxylic acid of pyrazine is dissolved in water and given in divided doses. One and a half ounces (45 Gm.) of brewers' yeast is recommended for children up to 6 years of age and 2 ounces (60 Gm.) for children from 6 years of age up to puberty. The daily dosage of yeast is mixed with milk and given in divided doses. The advantages of using crystalline chemical compounds are the ease of administration and rapidity of action. Yeast, although it is less easily administered, supplies several essential nutrients which these children lack.

Even in the absence of diagnostic lesions of pellagra the disease should be suspected in infants and children of families who have subsisted for long periods of time on an inadequate diet. Frequent examinations often reveal early signs of the disease. The administration of one of the therapeutic agents specific for pellagra in such cases offers a valuable therapeutic test, for these children will show prompt improvement following such therapy if early pellagra is present.

The representative history presented here illustrates the development of pellagra with typical diagnostic lesions early in childhood, and the response to diet and yeast therapy:

CASE 1.—R. J. A., an American white boy aged 3 years, was admitted to the pediatric ward of the Hillman Hospital with characteristic pellagra. The following history was obtained from his mother and father: He was allowed to eat whatever he chose and no attempt was made to have him eat anything he didn't like. His diet usually consisted of rice, honey, syrup, jelly, peanut butter, corn bread, biscuit crust, and occasionally oranges

and prunes. Occasionally he drank a small amount of butter-milk but always refused sweet milk. During the spring of the previous year he had an attack of pellagra which was characterized by a symmetrical erythema over the hands, elbows, knees and around the neck. For the past six months he had occasional diarrhea and vomiting, resulting in a steady loss of weight.

Physical examination showed that the child was undernourished and poorly developed and was unable to walk. There was an area of erythema over the nose and malar surfaces of the cheeks, and large areas of pigmented, desquamating skin over the elbows, dorsum of the wrists, hands, and lower third of the forearms. A smaller area was present on the right side of his neck (collar of Casal).

The child was placed on a high caloric, high vitamin diet, supplemented with 15 Gm. of yeast in iced milk three times a day. Feedings had to be given frequently and in small amounts throughout the day and night. Although on admission he refused to take anything but fluids, he began taking semisolid foods such as scrambled eggs and applesauce on the fourth day in the hospital. His appetite improved remarkably and within ten days he was eating everything in a high caloric diet. The acute lesions over the face and dorsum of the hands healed first and the more chronic ones later. On discharge from the hospital, the pigmented skin on his face, hands and arms was clear and he appeared more alert mentally.

The following case history illustrates pellagra without characteristic lesions in an 11 months old infant. The relationship of the nutritional state of the mother to the child, the necessity for repeated examinations of children of pellagrous parents, the value of the therapeutic test in establishing a diagnosis of the disease and the response to nicotinic acid therapy are demonstrated clearly.

CASE 2.—J. McC., a white boy aged 11 months, was admitted to the pediatric service of the Hillman Hospital because of diarrhea. Various treatments were instituted, including extensive trials on scraped apple, pectin preparations, neoprontosil, paregoric, crystalline vitamin B₁, skimmed milk, acidophilus milk, evaporated milk and mashed banana. There was no improvement in the diarrhea during this period. The following history was given by the parents: The child's mother has always eaten an unbalanced diet, high in carbohydrate and low in protein, minerals and vitamins, despite the fact that a liberal and varied food supply was available until eight years ago. During the past eight years, however, the family income has been irregular and always inadequate for their food needs. The mother and the six other children showed diagnostic evidence of pellagra during 1939 and all were under treatment.

The diet of the mother preceding the birth of this child was inadequate both quantitatively and qualitatively. She seldom had more than one meal a day, which consisted of dried beans, potatoes and occasionally oatmeal with a small amount of evaporated milk. Following the birth of the child her diet remained unchanged, and although she had little milk she nursed him until he was 2 months old. For the first two months of the child's life he received an insufficient amount of breast milk which, because of the mother's deficient diet, was probably of poor quality. At the age of 2 months he had pneumonia. Because he was undernourished, the doctor advised weaning him and prescribed for him a mixture containing 4 ounces (120 cc.) of evaporated milk and the juice of one orange daily. When he was 6 months old the quantity of evaporated milk was increased to 14 ounces (420 cc.). In addition he was given one egg, one serving of green beans or turnip greens and three graham crackers daily. He usually took all the food prescribed, and his diet, since he was 6 months old, had been adequate except in its vitamin D content. He had intermittent diarrhea, however, and failed to gain weight. One week before admission, the diarrhea became severe and since this time he had refused most of his food.

Because of the failure of the child to respond to various accepted methods of therapy for diarrhea and in view of the family history, a diagnosis of pellagra was made even though

1. The yeast, nicotinic acid and monocarboxylic and dicarboxylic acids of pyrazine were furnished by Mead Johnson & Co.

2. Bills, Charles E.; McDonald, Francis G., and Spies, Tom D.: Antipellagria Action of Pyrazine-2,3-Dicarboxylic Acid and Pyrazine Monocarboxylic Acid, *South. M. J.* 32: 793 (Aug.) 1939.

there were no characteristic lesions of the disease. One hundred and twenty-five mg. of nicotinic acid daily was added to his milk for two days. Within twenty-four hours the diarrhea disappeared and there was marked improvement in his general physical condition and appetite. Convalescence was rapid. The diagnosis of infantile pellagra, therefore, was confirmed by therapeutic test.

The following case history illustrates pellagra in early childhood and the response to treatment with monocarboxylic acid of pyrazine:

CASE 3.—B. H., a white boy aged 16 months, was admitted to the nutrition clinic of the Hillman Hospital with severe superficial stomatitis. The following history was given by the parents: The mother had always eaten an unbalanced diet, high in carbohydrates and fat, low in protein, minerals and vitamins. Until the child was 12 months old he received only breast milk. At this time, in addition to breast milk, which he continued to take until he was 14 months old, he began eating potatoes, dried beans, bread and occasionally an orange. He was allowed to eat as much of these foods as he wished and the amount he ate varied from time to time. He gained weight and seemed well until he was 14 months old, at which time he had "colitis" and for two weeks ate but little food, lost weight and became very weak. He was taken to a physician who advised weaning him. Since this time he had 1 pint of buttermilk daily, small amounts of oatmeal, potatoes and crackers, and occasionally an egg. His appetite was poor, he was not well, and he did not gain the 6 pounds (2.7 Kg.) he lost during his illness. Two weeks prior to admission he began refusing to eat and since this time he had only a small amount of oatmeal and buttermilk daily. The day he was admitted he became stuporous and was taken to a physician, who advised admitting him as an acute emergency case.

On admission the child was emaciated and apathetic. His tongue and buccal membranes were covered with superficial grayish ulcerations surrounded by fiery red erythema. No other physical abnormalities were noted. On two successive days the child was given 200 mg. of monocarboxylic acid of pyrazine, which was dissolved in sugar water. Twelve hours after administration the child willingly took food and his apathy disappeared. Many of the ulcerations had begun to heal and the erythema had vanished. One week later his mouth was entirely healed. He was alert mentally and was rapidly regaining his lost weight.

These studies suggest that infants and children who have subsisted on inadequate diets or whose parents have pellagra should be examined frequently for signs of the disease. The prognosis for a child is usually better than it is for an adult, but unless proper therapy is instituted the disease is likely to become increasingly severe as the person grows older until finally the skin, alimentary tract and nervous system become involved. Recovery is rapid and complete if a well balanced diet is given, supplemented, when necessary, with nicotinic acid, yeast or monocarboxylic or dicarboxylic acids of pyrazine.

SUMMARY AND CONCLUSIONS

1. The present study shows that, in an area in which pellagra is endemic, the disease is common among infants and children.

2. Nutritional histories often reveal that the mothers of these children subsisted on inadequate diets during pregnancy and lactation, thus establishing a definite relationship between the diet of the mother and the nutritional state of the infant.

3. Lesions characteristic of the disease are seldom seen in infancy but frequently appear early in childhood. In the absence of typical lesions, the administration of one of the therapeutic agents specific for pellagra offers a valuable therapeutic test in confirming a diagnosis of latent pellagra.

THE ELECTROCARDIOGRAPHIC CHANGES IN ACUTE PERICARDITIS

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PHILADELPHIA

Since it is usually a complication of a more easily recognized disease, acute pericarditis in the absence of an obvious pericardial friction rub or of a striking pulsus paradoxus is frequently overlooked. Despite the fact that a definite electrocardiographic pattern almost pathognomonic of acute pericarditis has been described, the value of this method of diagnosis has not been generally recognized. In our limited experience, moreover, several electrocardiograms typical of acute pericarditis have been erroneously attributed to coronary occlusion.

In 1929 Scott, Feil and Katz¹ described transitory elevation of the RT segments in all three leads of the electrocardiogram in a case of hemopericardium and in one of purulent pericarditis. These changes were attributed to cardiac tamponade resulting from increased amounts of pericardial fluid and it was emphasized that this type of electrocardiogram could be differentiated from that of acute myocardial infarction. Since then electrocardiographic changes have been described by others² in cases of pericarditis, hemopericardium and stab wounds of the heart. In most of these reports the electrocardiographic changes were likewise thought to be caused by ischemia of the myocardium resulting from cardiac tamponade. Experimental work on animals, meanwhile, showed that definite and reversible changes in the RS-T segments and T waves could be produced by increasing the intrapericardial pressure.³ No constant electrocardiographic pattern was observed in these various studies, but frequently the changes closely resembled those seen clinically.

In 1937 we⁴ reported a study of fourteen cases of acute pericarditis in which serial electrocardiograms

From the Morris W. Stroud Jr. Fellowship in Cardiology, the Medical Services and the Ayer Clinical Laboratory of the Pennsylvania Hospital.

1. Scott, R. W.; Feil, H. S., and Katz, L. W.: The Electrocardiogram in Pericardial Effusion: I. Clinical, *Am. Heart J.* 5: 68 (Oct.) 1929.

2. These include:
Purks, W. K.: The Occurrence of a Coronary T Wave in Purulent Pericarditis, *South. M. J.* 24: 1032 (Dec.) 1931.

Elkin, D. C., and Phillips, H. S.: Stab Wounds of the Heart, *Electrocardiographic Studies of Two Cases*, *J. Thoracic Surg.* 1: 113 (Dec.) 1931.

Porter, W. B., and Bigger, I. A.: Nonfatal Stab Wounds of the Ventricles, *Am. J. M. Sc.* 184: 799 (Dec.) 1932.

Harvey, John, and Scott, J. W.: Changes in the Electrocardiogram in the Course of Pericardial Effusion with Paracentesis and Pericardiectomy, *Am. Heart J.* 7: 532 (April) 1932.

Clowe, G. M.; Kellert, Ellis, and Gorham, L. W.: Rupture of the Right Auricle of the Heart, *ibid.* 9: 324 (Feb.) 1934.

Koucky, J. D., and Miles, George: Stab Wounds of the Heart, *Arch. Int. Med.* 56: 281 (Aug.) 1935.

Schwab, E. H., and Herrman, George: Alterations of the Electrocardiogram in Diseases of the Pericardium, *ibid.* 55: 917 (June) 1935.

Wood, Paul: Electrocardiographic Changes of a T₂ Pattern in Pericardial Lesions and Stab Wounds of the Heart, *Lancet* 2: 796 (Oct. 2) 1937.

3. These works include:
Katz, L. N.; Feil, H. S., and Scott, R. W.: The Electrocardiogram in Pericardial Effusion: II. Experimental, *Am. Heart J.* 5: 77 (Oct.) 1929.

Foulger, Margaret, and Foulger, J. H.: The Blood Pressure and Electrocardiogram in Experimental Pericardial Effusion, *ibid.* 7: 744 (Aug.) 1932.

Bay, E. B.; Gordon, Wayne, and Adams, Wright: Electrocardiographic and Blood Pressure Changes in Experimental Pericardial Effusion and Occlusion of the Venae Cavae, *ibid.* 8: 525 (April) 1933.

Randles, F. S.; Gorham, L. W., and Dresbach, Melvin: Changes in the RS-T Component of the Electrocardiogram Produced by Experimental Rupture of the Auricles of the Dog's Heart and by Pericardial Injection, *ibid.* 9: 333 (Feb.) 1934.

Herrmann, George, and Schwab, E. H.: Some Experimental and Clinical Electrocardiographic Observations on RS-T and T Changes in Pericarditis, *Tr. A. Am. Physicians* 49: 229, 1934.

4. Vander Veer, J. B., and Norris, R. F.: The Electrocardiographic Changes in Acute Pericarditis, *Am. Heart J.* 14: 31 (July) 1937.

were taken. In addition to the usual three leads a chest lead, with the apex of the heart and the left leg (lead 5 of Wolferth and Wood⁵), was employed as a routine. A characteristic electrocardiographic pattern was present in five of seven cases of purulent pericarditis and in one case of hemopericardium but in none of six cases of nonpurulent pericarditis. This pattern consisted of elevation of the RT segments in the three limb leads, most marked in lead 2, without the occurrence of significant Q waves. No definite changes were observed in the chest lead. These acute changes persisted for only a few days and in some cases returned to normal despite progression of the disease, with increasing amounts of pericardial fluid and signs of cardiac tamponade. Postmortem examinations were done in ten of the eleven fatal cases. Correlation of the observations

tion to the conventional limb leads. A similar electrocardiographic pattern was found in nearly 50 per cent of the cases of nontuberculous pericarditis and in two of twenty cases of tuberculous pericarditis. Deflections of the RT segments in the chest leads were at times more marked than in the limb leads. They also concluded that the changes of the RT segments were usually caused by subepicardial myocarditis.

Since our previous report we have been using a different precordial lead in the study of cases of pericarditis. This lead is one of those which has recently been recommended for routine use by the American Heart Association and the Cardiac Society of Great Britain and Ireland.⁷ By these organizations, lead 4 F (apex and left leg) was given slight preference to lead 4 R (apex and right arm) as a lead for ordinary use. Lead 4 F is the inverted mirror image of old lead 5 of Wolferth and Wood and, in both of these leads, deviations of the RT segments in acute pericarditis are usually minimal or absent.⁸ In contrast to this, we have found that elevation of these segments in lead 4 R may be even greater than in the limb leads.⁹ To illustrate this point and to reemphasize the importance of the electrocardiogram in the diagnosis of acute pericarditis, the following cases are reported:

REPORT OF CASES

CASE 1.—D. R., a Negro aged 55, admitted to the medical service of Dr. Garfield G. Duncan Nov. 16, 1937, for four days had symptoms typical of lobar pneumonia. On examination, signs of consolidation were elicited over the lower lobe of the left lung. The temperature remained elevated between 101 and 104 F. *Pneumococcus* type II was cultured from both the sputum and the blood. A pleuropericardial friction rub, heard near the apex of the heart November 20, disappeared a few days later. November 28, 45 cc. of cloudy fluid, thought to be removed from the pericardial sac, showed no growth on culture. The pericardial sac was not again tapped. November 30, 120 cc. of cloudy but sterile fluid was withdrawn from the left pleural cavity, but on subsequent occasions small amounts of purulent fluid aspirated from the left pleural cavity gave pure cultures of *pneumococcus* type II. Roentgenograms of the chest at first confirmed the clinical impression of lobar pneumonia in the lower lobe of the left lung and later of a small empyema of the left pleural cavity. The heart shadow was at all times enlarged, but no progressive increase in size was demonstrated. The patient continued to have a high fever and became increasingly dyspneic and cyanotic. The superficial veins of the neck were engorged and the liver became enlarged and tender. Slight peripheral edema was noted. Digitalization had little beneficial effect on the cardiac failure and he died December 11, twenty-five days after admission and twenty-nine days after the onset of the illness.

Of the laboratory data, the electrocardiograms were of especial interest. Repeated electrocardiograms, the first of which was taken November 22, two days after the friction rub was first heard, showed elevation of the RT segments in all leads. A gradual return of these changes to normal began November 26, and by December 10, the day before death, the only abnormalities were diphasic T waves in all leads, which may have been secondary to digitalization (fig. 1).

The anatomic diagnosis was: lobar pneumonia of the lower lobe of the left lung (*pneumococcus* type II); marked fibrinopurulent pericarditis and superficial myocarditis (*pneumococcus* type II); empyema of the left pleural cavity (*pneumococcus* type II); atelectasis of the lower lobe of the left lung; chronic passive congestion of the lungs, liver, spleen and pancreas; hypoplasia of the bone marrow.

7. Joint Recommendations of the American Heart Association and the Cardiac Society of Great Britain and Ireland: Standardization of Precordial Leads, *J. A. M. A.* 110:396 (Jan. 29), 681 (Feb. 26) 1938; *Am. Heart J.* 15:107 (Jan.), 235 (Feb.) 1938.
8. Edwards, J. C., and Vander Veer, J. B.: A Study of the Chest Leads of the Electrocardiogram with an Evaluation of the Positions of the Precordial Electrode, *Am. Heart J.* 16:431 (Oct.) 1938.
9. The exact technic that we employed in taking this lead (4 R) has been recently described in a report by one of us.⁴

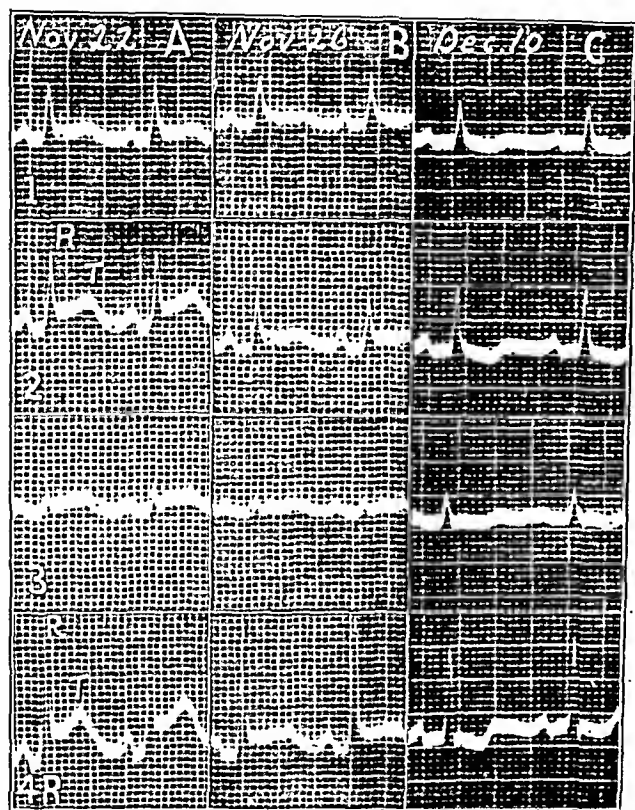


Fig. 1 (case 1).—A, record taken two days after a pleuropericardial friction rub was heard, shows an elevation of the RT segments in the three limb leads, greatest in lead 2, and a striking elevation of the RT segments in the precordial lead (apex and right arm). This is the typical pattern of acute pericarditis. B, record taken four days later, shows the changes still present though less marked. C, record taken a few hours before death, shows that RT segments have returned to the normal level and the T waves are diphasic in all leads. Some of this T wave change is probably "digitalis effect," as the patient was receiving full doses of this drug. Postmortem examination revealed 650 cc. of thick pus in the pericardial sac, empyema (both *pneumococcus* type II) and evidence of congestive heart failure.

made on clinical, electrocardiographic and postmortem examinations indicated that there was little or no relation between the amount of pericardial fluid and the electrocardiographic changes. The conclusion was reached that this typical electrocardiographic pattern was associated with superficial myocarditis secondary to inflammation of the epicardium.

Bellet and McMillan⁶ subsequently reported a larger series of cases of acute pericarditis in which the three chest leads of Wolferth and Wood⁵ were used in addi-

5. Wolferth, C. C., and Wood, F. C.: The Electrocardiographic Diagnosis of Coronary Occlusion by the Use of Chest Leads, *Am. J. M. Sc.* 183:30 (Jan.) 1932.
6. Bellet, Samuel, and McMillan, T. M.: Electrocardiographic Patterns in Acute Pericarditis, *Arch. Int. Med.* 61:381 (March) 1938.

At necropsy 650 cc. of thick green pus was found in the pericardial sac and about 400 cc. in the left pleural cavity. Pure cultures of pneumococcus type II were obtained from both these exudates. The thick purulent epicardial exudate was already organizing and there was no cellular infiltration of the underlying muscle. The outer portion of the myocardium of both ventricles, however, was pale staining. Many of the fibers contained droplets of fat and the fibrils were broken. Most of the nuclei were vacuolated. Since the lower lobe of the left lung was evidently compressed by the pleural exudate, the alveolar walls were partially collapsed. Nowhere in sections of the lungs was there any evidence of bronchitis or pneumonia. Large patches of edema and "heart failure" cells, however, were present in the parenchyma. The splenic pulp and the central portions of the lobules of the liver were engorged with blood, and the acini of the pancreas were shrunken. The activity of the bone marrow of a rib and vertebral body was subnormal. The immediate cause of death was thought to be congestive heart failure.

The clinical diagnosis of acute pericarditis secondary to lobar pneumonia was confirmed by the electrocardiogram. The elevation of the RT segments persisted for only a week even though pus continued to be present in the pericardial sac. It is noteworthy that at necropsy most of the 650 cc. of pus in the pericardial cavity was posterior to the heart because of anterior intrapericardial adhesions. The return of the electrocardiogram to normal, the failure to demonstrate a progressive enlargement of the pericardium and the failure to aspirate purulent fluid from what was thought to be the pericardial sac influenced the clinicians against surgical drainage of the pericardium. The fever continued, however, and digitalization had no influence on the signs of heart failure. Since there was no residual pneumonia at necropsy, and the apparent cause of death was cardiac failure, surgical drainage of the pleural and pericardial cavities might have been life saving.

CASE 2.—M. L., a white woman aged 67, admitted to the medical service of Dr. David L. Farley July 17, 1938, had noticed weakness and shortness of breath for a number of months and had been acutely ill with fever and cough, productive of thick yellow sputum, for four or five days. The day before admission, persistent pain in the lower left part of the chest was first experienced. On examination the patient was senile and acutely ill. Herpetic lesions were seen about the lips. She was dyspneic and cyanotic but there was no peripheral edema. The contour of the chest suggested emphysema. Evidence of consolidation was found at the bases of both lungs. The area of cardiac dullness was slightly increased. Although the heart sounds were very faint and a marked pulsus paradoxus was present, a pericardial friction rub was not heard. On fluoroscopy no definite pulsation of the heart was seen and a roentgenogram showed patches of pneumonia in the lower lobes of both lungs. After several unsuccessful attempts to aspirate fluid from the pericardial sac, on July 23, 330 cc. of cloudy fluid was obtained at the apex of the heart in the fifth left intercostal space. Before the fluid was completely removed the pulsus paradoxus disappeared and the cyanosis and dyspnea were lessened. In a smear of this fluid, numerous gram-positive cocci were seen but no growth occurred on culture. Because of the return of cyanosis, dyspnea and pulsus paradoxus on August 1 and 2, 10 cc. and 250 cc. of cloudy fibrinous fluid respectively were removed from the pericardial sac. Air injected at the time of the last paracentesis was shown in a roentgenogram to be in the pericardial cavity. Cultures of both these specimens, however, showed the presence of *Staphylococcus aureus*.

During August further attempts at removing fluid from the pericardial sac were unsuccessful. August 3 and 26, 250 cc. of slightly cloudy but sterile fluid was aspirated from the left pleural cavity. At first the patient's temperature varied between 98 and 101 F., but during August the temperature slowly returned to normal. At the same time the signs of consolidation in the lungs gradually became less marked and the heart sounds

became louder. A pericardial friction rub was never heard. In September, however, although pulsus paradoxus was only infrequently present, the patient became dyspneic and cyanotic. The liver was enlarged and tender, and edema of both legs appeared. Late in September the right leg became increasingly swollen, red and tender. Incision and drainage of the leg because of a suppurative cellulitis were necessary. *Staphylococcus aureus* was cultured from the pus. The patient recovered satisfactorily from this infection and the signs of congestive failure diminished with digitalization. Temporary auricular fibrillation was noted and partial heart block with occasional dropped ventricular beats was observed after the administration of digitalis. Because of senile dementia the patient was transferred to another hospital on October 26.

For much of her stay in the hospital there were a moderate leukocytosis and slight anemia. Small amounts of albumin were present in the urine. At first the blood urea nitrogen

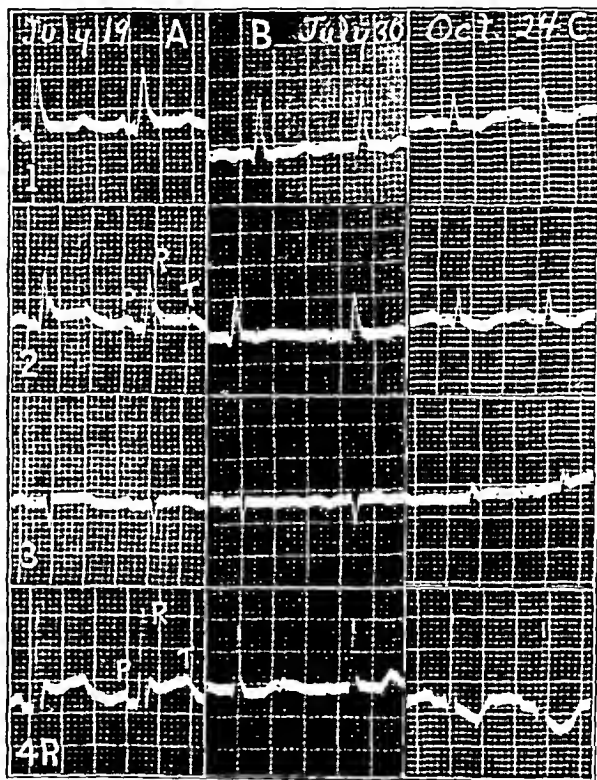


Fig. 2 (case 2).—Bronchopneumonia. A, a routine record taken two days after hospital admission, shows the characteristic pattern of acute pericarditis, which was not suspected clinically. Note the elevation of the RT segments in all leads. These changes persisted for nearly ten days and gradually subsided. Purulent fluid with *Staphylococcus aureus* was obtained on pericardial tap. B shows auricular fibrillation, which was transient, and return of the T waves to the normal level. C, record taken three months later, shows that there is a lowering of the amplitude of the QRS complexes in the limb leads and diphasic T waves. No evidence of pericarditis was present at this time, but digitalis was being given because of mild cardiac failure.

varied between 30 and 53 mg. per hundred cubic centimeters but in September a normal level was present. Other laboratory data were irrelevant. After admission repeated electrocardiograms showed marked elevation of the RT segments in leads 1, 2 and 4. These changes returned to normal July 30. During August the T waves of leads 1, 2 and 4 first became diphasic and then inverted, and a slight lengthening of the PR interval was noted. No further change of the RT segments had occurred when the patient left the hospital (fig. 2).

A routine electrocardiogram was responsible for the discovery of acute pericarditis in this patient, who was acutely ill with bronchopneumonia. Because of the patient's age and the apparent subsidence of a mild pericarditis following aspiration, operation was deemed inadvisable. It was felt that the typical electrocardio-

graphic pattern of pericarditis as well as the clinical condition excluded the possibility of coronary occlusion.

CASE 3.—D. G., a white boy aged 13 years, admitted to the medical service of Dr. David L. Farley June 22, 1938, complained of anorexia and diarrhea. He was known to have had rheumatic heart disease since the age of 6 years and had attended the cardiac clinic of the Pennsylvania Hospital. For two weeks before admission he had fever, loss of appetite and slight diarrhea. On admission, the previous diagnosis of mitral stenosis and insufficiency and aortic insufficiency was confirmed. The systolic blood pressure was 120 and the diastolic 30 mm. of mercury. He appeared feverish and acutely ill. At first the patient's temperature was elevated daily as high as to 103 F. but the fever gradually subsided and he appeared improved. In the hospital he had no diarrhea. During August, however, he became worse and his temperature varied between 99 and 102 F. A pericardial friction rub was first suspected August 11 and by August 13 was marked to the left of the sternum, from the second to the fourth interspace. A pulsus paradoxus was not noted at any time and the venous pressure was not determined. He complained of precordial pain, became dyspneic and had a dry, nonproductive cough. The liver became larger but there was no peripheral edema. The patient was thought to have an acute exacerbation of rheumatic carditis and early congestive heart failure. In spite of the severity of the illness, his family signed his release from the hospital August 19.

Repeated blood counts showed moderate anemia and leukocytosis. The sedimentation rate at all times was much increased. Roentgenograms of the chest showed a progressive increase in the size of the heart, particularly to the left, but fluoroscopically

August 12 elevation of the RT segments in all leads of the electrocardiogram was first noted and was thought to be typical of acute pericarditis (fig. 3).

The acute pericarditis in this case undoubtedly resulted from rheumatic fever. At the time of admission there was no evidence of pericarditis, although

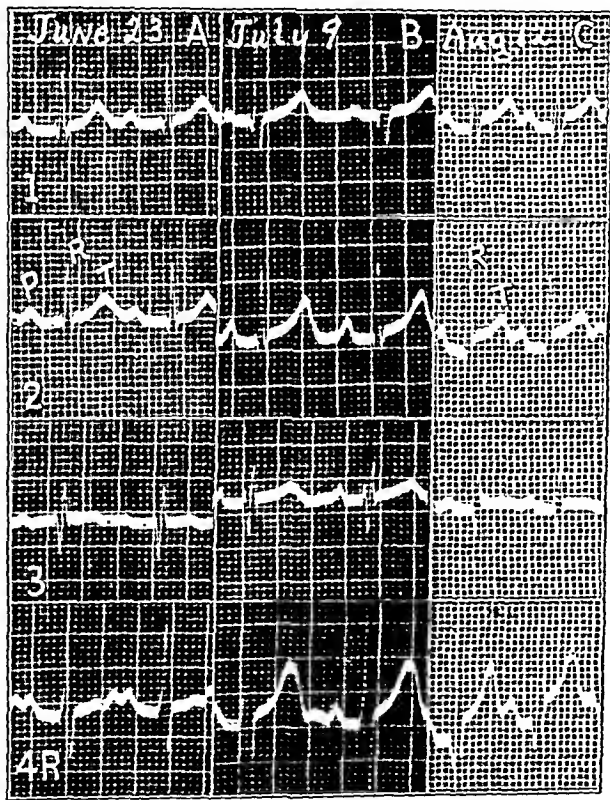


Fig. 3 (case 3).—Active rheumatic heart disease. A, record taken just after admission to the hospital, shows partial heart block (PR interval 0.24 second) but no definite evidence of active rheumatism with fever, dyspnea and precordial pain, shows the typical pattern of acute pericarditis. A loud pericardial friction rub was subsequently present for several days. No digitalis was being given. Note the elevation of the RT segments in all leads, greatest in leads 2 and 4.

cardiac pulsations were definitely visible. An electrocardiogram taken the day after admission showed a partial heart block (PR interval of 0.24 second) but by July 9 this abnormality had disappeared and the PR interval was 0.18 second. On

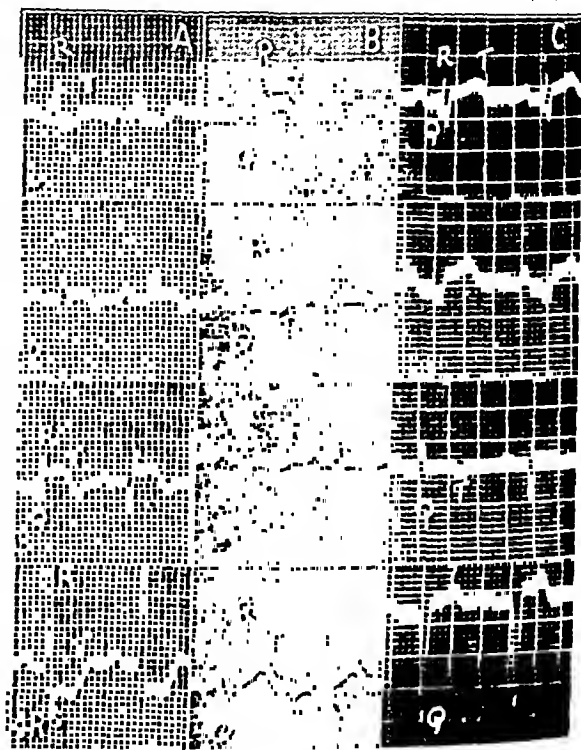


Fig. 4.—A, electrocardiogram of a patient with a recent posterior myocardial infarction. Note the elevation of the RT segments in leads 2 and 3, greatest in the latter, and the slight depression of the RS-T segments in lead 1. The precordial lead (4 R) shows a considerable depression of the RS-T segments. Note also the definite Q waves in lead 3, which became more prominent as the T waves rapidly became inverted in leads 2 and 3. The T waves in leads 1 and 4 returned quickly to normal. B, record of a patient with a recent anterior myocardial infarction. Definite elevation of the RT segments are present in leads 1 and 2 with beginning inversion of the T waves. Note also the definite Q waves in these leads and that the RT elevation is slightly higher in the first lead. Slight depression of the RT segments is seen in lead 3. Lead 4 shows a relatively deep Q wave and some RT elevation. The presence of definite Q waves in leads 1 and 4, with a slight reciprocal action of the RT segments in leads 1 and 3, makes the diagnosis of myocardial infarction quite definite. C, electrocardiogram of a patient with a combined anterior and posterior infarction. Elevation of the RT segments is seen in all the limb leads, greatest in lead 2. Q waves are present in all leads, however, and there are marked changes in the QRS complex of the chest lead with the loss of the initial positive deflection (R wave). There was subsequently a rapid change in and as record with deep inversion of the T waves in leads 1 and 2 and an increase in the size of the Q waves in these leads. The deep Q waves persisted in the precordial lead and the T waves became sharply inverted. (The precordial lead taken originally in this case was the old lead 5. It has been reprinted by inverting and reversing the negative so that it conforms to the new terminology. This in no way alters the interpretation and makes it comparable to the other records.) Although the changes in the RT segments per se in this record conform to the pattern of acute pericarditis, the development of typical Q waves and the marked changes in the precordial lead easily differentiate it from this condition.

the electrocardiogram showed a temporary partial heart block (delayed PR interval). The electrocardiogram then returned to normal and, following an exacerbation of the infection, the typical clinical and electrocardiographic signs of acute pericarditis were observed.

COMMENT

A definite and characteristic electrocardiographic pattern is found in many cases of acute pericarditis. This typical pattern consists of elevation of the RT segments in the three limb leads and in the chest lead 4 R (apex of heart and right arm) which we have employed. In the case of the limb leads, elevation may be especially marked in lead 2 or in leads 1 and 2 together. The RT segments may also be more strik-

ingly elevated in the chest lead than in any of the limb leads. These changes may be caused by any type of pericarditis but most frequently by acute purulent pericarditis or hemopericardium. The abnormalities of the electrocardiogram are usually found early in the disease, are transient and may persist for only a few days. It is especially important to remember that the electrocardiogram may return almost to normal even though the infection and inflammation of the pericardial sac may be continuing and the pericardial effusion increasing. In contrast to acute pericarditis, most cases of chronic pericarditis show no definite electrocardiographic pattern, and abnormalities are usually limited to nonspecific changes in the T waves.

The most common lesion with which the electrocardiogram of acute pericarditis is confused is that of coronary occlusion. Since the clinical manifestations of precordial pain, fever, pericardial friction rub, leukocytosis and the like may be present in both diseases, the differentiation between them may at times depend largely on the interpretation of the electrocardiogram. In the case of myocardial infarction caused by coronary occlusion, the early transient abnormalities of the electrocardiogram are usually characterized by reciprocal deflections in leads 1 and 3. Thus in anterior infarction the elevated RT segments in lead 1 are usually associated with slight depression of these segments in lead 3, and in posterior infarction the elevation of the RT segments in lead 3 are also associated with depression of these segments in lead 1 (fig. 4 A). In the case of coronary occlusion, furthermore, definite Q waves are often present in leads 1 or 3 (fig. 4 B), but in acute pericarditis significant Q waves are generally absent in all leads except when they have been present before the onset of the pericarditis. Acute myocardial infarction involving both the anterior and the posterior wall of the left ventricle may give an elevation of the RT segment in all leads similar to that seen in acute pericarditis.¹⁰ In these rare instances, however, the presence of Q waves in the limb leads and changes in the precordial lead establish the identity of the lesion (fig. 4 C). The recently described electrocardiographic pattern of acute lateral infarction, moreover, does not in any way resemble that of acute pericarditis.¹¹ Finally, if there is a return toward normal in the electrocardiographic pattern and particularly if the patient survives, it has been our experience that the subsequent tendency for the T waves to become inverted is much less marked in acute pericarditis than in coronary occlusion.

Until recently the abnormal deflections of the RT segments in cases of acute pericarditis and hemopericardium were explained largely on the basis of myocardial ischemia secondary to cardiac tamponade. Increased amounts of pericardial fluid were thought to increase the intrapericardial pressure to such an extent that coronary insufficiency resulted. To corroborate this view there were several experimental studies on animals in which an increase in intrapericardial pressure produced electrocardiographic changes, some of which closely resembled the pattern which had been described clinically.³ These changes were reversible in most instances. Recent clinical studies, however, demonstrate that the typical pattern of acute pericarditis is frequently seen with no increase in the amount of pericardial fluid and that a marked pericardial effusion

may accumulate slowly or rapidly without significant deflections of the RT segments. Postmortem examination in a number of cases has also indicated that the typical changes in the electrocardiogram are associated with and are probably caused by a subepicardial myocarditis. If the inflammation does not involve the myocardium, however, the pericarditis even though purulent may cause little or no change in the electrocardiogram.

Like any laboratory aid, the electrocardiogram is of greatest value when it gives positive evidence. Negative evidence must always be considered with caution. The electrocardiogram in acute pericarditis may return almost to normal within a few days, even though the changes have previously been striking and even though the patient has not improved. We wish to emphasize, however, that a definite electrocardiographic pattern typical of pericarditis has been described and that the importance of the electrocardiogram in the diagnosis of this disease has been established.

SUMMARY

1. The definite and characteristic electrocardiographic pattern seen in many cases of acute pericarditis was found in the three cases here presented.

2. The electrocardiographic pattern of acute pericarditis can be differentiated from that of acute myocardial infarction.

3. In cases of acute pericarditis, the changes in the electrocardiogram are generally caused by subepicardial myocarditis.

4. Lead 4 R (apex and right arm) is more valuable than lead 4 F (apex and left leg) in demonstrating the electrocardiographic changes in acute pericarditis.

5. The electrocardiogram is important in the diagnosis of acute pericarditis.

302 South Nineteenth Street.

Clinical Notes, Suggestions and New Instruments

AN UNSUCCESSFUL METHOD OF BIRTH CONTROL

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The physician called on to advise his patients with regard to birth control is constantly on the lookout for some method just as effective as but simpler in technic than the commonly accepted methods of vaginal diaphragm or condom used with an intravaginal jelly.

One such product, marketed now for several years, consists of a jelly which is forcibly blown into the vaginal vault by a special applicator. The jelly itself does not have an unusual formula, consisting of a gum tragacanth base, boric acid, sodium chloride, oxyquinoline sulfate, lactic acid and glycerin. It does not melt at body temperature. This very effective type of applicator "splashes" the jelly into the vicinity of the cervix, and in the advertising material a contrast medium picture shows the external os well plugged by jelly.

The theoretical consideration of such a method nearly convinces one of its simplicity and effectiveness. The product appears even more attractive after one reads photostatic copies of letters from physicians who report using it successfully in their practice, one such report even coming from the head of the obstetric department in a university hospital. However, following is the record of twenty-three patients who used this method—patients in a small town practice where one's birth control failures do not become lost from sight but "come home to roost" on one's own confinement calendar. This series, while neither large nor observed over a long period of time, never-

10. Wolferth, C. C., and Wood, F. C.: Acute Cardiac Infarction Involving Anterior and Posterior Surfaces of the Left Ventricle, *Arch. Int. Med.* 56: 77 (July), 1935.

11. Wood, F. C.; Wolferth, C. C., and Bellet, Samuel: Infarction of the Lateral Wall of the Left Ventricle: Electrocardiographic Characteristics, *Am. Heart J.* 16: 387 (Oct.), 1938.

theless permits certain definite conclusions. These patients were all of average or above average intelligence, all had had the method fully explained to them and, from careful questioning, all apparently followed directions closely.

Of twelve nulliparous patients, ten have thus far successfully used this method over an average time of 10.1 months, the shortest period of observation being six months and the longest eighteen months. In the nulliparous group there were two failures, one after two months and the other after three months. In the parous group were eleven patients. Successful were three, with an average time of observation of ten months. Pregnancies resulted in eight of the eleven. Two became pregnant one month after beginning this method, two more became pregnant in three months; the longest period of protection was eight months and the average for the group was only 4.1 months.

CONCLUSION

Twenty-three patients were studied who used as a birth control method a jelly forcibly sprayed into the vaginal vault with a special applicator. In the group of twelve nulliparous patients two became pregnant; of the eleven parous patients eight became pregnant.

This method of birth control is only fairly reliable for nulliparous women and is markedly unreliable after there has been a pregnancy.

HYPERSENSITIVITY TO SOLUTION OF POSTERIOR PITUITARY

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In 1936 I¹ reported a case of profound shock following the administration of solution of posterior pituitary. To this patient, following a spontaneous abortion, solution of posterior pituitary was given in 0.5 cc. doses at half hour intervals for four doses. Approximately a half hour after the last injection the patient was in shock. Later 1 cc. of solution of posterior pituitary was given, which almost immediately put her into a profound and frightening shock condition.

I am here reporting another case of hypersensitivity to solution of posterior pituitary. This is being done to add another case to the all too meager literature and to try to make the physician more cognizant of the bizarre and sometimes dangerous reactions that may follow the administration of a commonly used drug.

REPORT OF CASE

Mrs. F. F., a tertigravida aged 27, was admitted to the hospital May 14, 1939, with a history of having had vague abdominal and sacro-iliac pains at regular intervals for about twelve hours. Two weeks before she had entered the hospital and had remained there twenty-four hours for the same complaint. At that time she was discharged after the uncomfortable condition had been controlled with sedatives. After thirty-six hours of vague abdominal discomfort it was thought that the wiser procedure would be to induce labor. The patient was at term and also, as an added deciding factor, she lived 24 miles from the hospital.

At 6 a. m. 2 ounces (30 cc.) of castor oil was given. At 6:30 she had a bowel action and a hot, high soapsuds enema was given. As this was being expelled (6:40) 2 minims (0.13 cc.) of solution of posterior pituitary was given hypodermically. Ten minutes later the patient had urticarial wheals over the whole body. She was gasping for breath and was nauseated, the tongue, face and legs were swollen, there was marked pallor and she had the sensation of impending death. The blood pressure, which had been 140 systolic, 80 diastolic, was 76 systolic, 50 diastolic. Epinephrine was given immediately and most of the symptoms disappeared in a short time or were markedly lessened. Vaginal examination at 8 o'clock revealed a cervix effaced and one and one-half fingers dilated.

The presenting part, the vertex, was dipping into the pelvis. At this time the membranes were ruptured artificially. She was delivered at 2:28 p. m. by elective low forceps of a normal boy baby weighing 8 $\frac{3}{16}$ pounds (3,686 Gm.). The placenta was expelled three minutes afterward. During labor morphine one-eighth grain (0.008 Gm.), scopolamine $\frac{1}{100}$ grain (0.0006 Gm.) and pentobarbital sodium $7\frac{1}{2}$ grains (0.5 Gm.) were given in divided doses. The labor was not abnormal—just what would be expected from one that had been induced.

The patient had had two previous deliveries, in 1936 and 1938. She had been nauseated for the entire duration of both of these pregnancies. The second one had been complicated by polyhydramnios. The first labor had been short, the second long. After both she had received 1 cc. of solution of posterior pituitary with no untoward results.

During this pregnancy, the third, she had had only the symptoms that a nervous multipara would have. There were no signs of toxemia. The Wassermann reaction was negative. She did have polyhydramnios, however. At no time were there any allergic signs or symptoms, and the past history was negative for any allergic manifestations.

On her third postpartum day, with her permission, 1 minim (0.06 cc.) of solution of posterior pituitary was injected hypodermically. Almost immediately she had the same reaction that she had had before. The urticaria was worse, particularly on the thighs and back, itching was more intolerable, and dyspnea was not quite as marked and the blood pressure did not drop as far. This may have been because we gave epinephrine as soon as we were sure that an anaphylactic reaction was starting. The hands, feet and face were more swollen than at the time of the previous reaction. Epinephrine was repeated three times, morphine one-sixth grain (0.01 Gm.) was given once. In spite of this, twelve hours later she was very uncomfortable. She complained bitterly of abdominal cramps; the uterus seemed to be in tetanic contraction most of the time. The next day her condition was normal, and three weeks later it was still normal.

COMMENT

Because of the constant and universal use of the drug, it seems strange that more cases of hypersensitivity to solution of posterior pituitary have not been reported. Hasson casually mentions that there have been cases previous to his reported one in 1930. De Lee in a personal communication says he has observed the phenomenon and Dieckman, quoted by De Lee, warns against the possibility. Twelve references were found in the literature, most of the cases being similar to the one reported here. Simon, and Pendleton and his associates subjected their patients to scratch tests with different brands of solution of posterior pituitary with positive results, but the exact mechanism of the phenomenon is not definitely known. Simon denies that there is excessive oxytocic action accompanying the reaction, while Pendleton insists that there is. It is interesting to note that in my case the first injection did not cause tumultuous uterine contractions. Three days afterward, however, when 1 minim was given, uterine cramps were very painful. My patient would not permit scratch tests to be made either on her or on her baby.

There have been several series of cases of postpartum shock reported in the recent literature, in some of which the etiologic factors have been unexplained. It would be interesting to know to how many of these patients solution of posterior pituitary had been given. Perhaps many more cases of shock occur from this cause than one suspects. For this reason I should hesitate before giving large doses and particularly repeated doses of solution of posterior pituitary. In cases of postpartum hemorrhage from atonic uteri, ergonovine preparations are probably safer and should be more efficacious. It is suggested that, when solution of posterior pituitary is given, epinephrine 1:1,000 be ready for instant use. If there is a reaction which cannot be controlled by epinephrine, magnesium sulfate might be tried intravenously.

Masonic Temple.

From the Obstetric Service, Danville Community Hospital.
1. McMann, Walter: Pituitary Shock, *Am. J. Obst. & Gynec.* 31: 1047 (June) 1936.

Special Clinical Article

TREATMENT OF PERITONITIS

CLINICAL LECTURE AT ST. LOUIS SESSION

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From the surgeon's point of view, peritonitis arising from perforations and leakage from intra-abdominal viscera is of chief interest. Since there is no specific therapy for peritonitis, treatment may be divided into procedures for the removal of the source of the infection and supportive measures to aid natural defenses. When the treatment is being planned, an estimate should be made of the pathologic condition, the altered physiologic function and changes in body chemistry, and the methods to be employed should be based on this estimate in each individual case.

Factors in the treatment of acute peritonitis worthy of special consideration may be outlined and discussed under the following headings:

1. Operation and abdominal drainage.
2. Decompression of the distended intestine.
3. Maintenance of the intestinal tone.
4. Use of peristaltic stimulants.
5. Maintenance of water and chemical balance.
6. Food supply.
7. Local application of heat.
8. Antitoxic serum therapy.
9. Chemotherapy.
10. Bed posture.
11. Oxygen therapy.
12. Blood transfusions.

OPERATION AND ABDOMINAL DRAINAGE

In the early stages of a perforated abdominal viscus it is logical to remove the source of the infection or close the leak by operation to prevent general peritoneal contamination. The results of early operation before abdominal distention and intestinal stasis have developed have been satisfactory. After the infection has become generalized and abdominal distention and inhibition of intestinal activity have occurred, operation is probably of little value unless there is a local accumulation of pus. Conservative treatment of general peritonitis, first advocated by Ochsner and now considerably elaborated, is fundamentally sound. Since peritonitis secondary to appendicitis has received the greatest attention, the value of the conservative method of treatment may be based on this type of infection. Unfortunately a unanimity of opinion does not exist among surgeons concerning the operative and nonoperative treatment of peritonitis due to appendicitis. However, if the issue is not clouded by the inclusion of local or early peritonitis and localized abscess, the weight of evidence is in favor of the nonoperative or conservative method of treatment. Mont Reid¹ warns that the total mortality of acute appendicitis may actually be increased unless the entire medical profession learns the clear indications for conservative therapy. It seems obvious that in a discussion of the treatment of general peritonitis only those cases presenting the clinical signs and symptoms of such infection should be segregated for nonoperative

treatment. In cases in which there is abscess formation, resolution may result if judicious restraint is practiced by the surgeon.

The futility of attempting to drain the peritoneal surface is now generally recognized. As early as 1905 Yates² concluded that drainage of the general peritoneal cavity is physically and physiologically impossible. Any operative procedure designed to expose infected areas and place multiple drains in contact with the peritoneum can only do harm. There is a growing belief that complete closure of the abdomen in the presence of diffuse peritonitis is preferable to any type of drainage. Buchbinder and his associates³ observed that abdominal drainage increased the mortality in experimental peritonitis. Clinical reports have also indicated a reduction of mortality in acute peritonitis when the abdomen is closed without drainage.⁴ Since there is no universal agreement concerning drainage of peritoneal infections, definite recommendations applicable to all cases are difficult to make. When localized collections of pus or necrotic material are encountered at operation, drainage is indicated. Massive drainage is never indicated. Drains should not be placed on the assumption that purulent exudate will collect at a certain site and the presence of drains will prevent it. Any drain within the abdominal cavity is soon surrounded by adhesions and acts as a foreign body. The principle of placing drains so that contact with the peritoneal surface is minimal is good physiologic surgery. If drains are used for diffuse peritoneal infections they should be placed near, but not on, the original source of infection and should be removed early. When purulent exudates are found within the abdomen, adequate drainage of the abdominal wall is essential. Much suturing in the presence of infection adds foreign material and closes contaminated areas which predispose to the development of serious wound infection. In severe infections the peritoneum should be sutured and the remainder of the wound packed open or loosely closed with sutures passed through the full thickness of the abdominal wall down to the peritoneum.

Various procedures have been suggested for cleansing the abdominal cavity at operation. This type of treatment should be abandoned. Complete removal of all infection by washing or chemical sterilization of the peritoneum is quite impossible and contrary to known physiologic principles. Careful removal of excessive exudate by suction as part of the operation is in order, but extended efforts to cleanse the peritoneal surfaces disturb the natural protection against infection. As an infection progresses over the peritoneal surface a defensive exudate is elaborated which, when disturbed or removed, increases rather than decreases absorption. The experimental work of David and Sparks⁵ has shown that a well developed plastic peritonitis almost completely prevents the passage of *Bacillus coli* from the peritoneal cavity into the lymphatic or blood streams. This was found true also of the diphtheria toxin. From the normal peritoneum or in the presence of a transudate, both *Bacillus coli* and diphtheria toxin passed freely into the blood and lymph streams.

2. Yates, J. L.: An Experimental Study of the Local Effects of Peritoneal Drainage, *Surg., Gynec. & Obst.* 1: 473 (Dec.) 1905.

3. Buchbinder, J. R.; Droegemueller, W. A., and Heilman, F. R.: The Effect of Drainage upon Experimental Diffuse Peritonitis, *Surg., Gynec. & Obst.* 53: 726 (Dec.) 1931.

4. Cottis, G. W., and Ingham, H. W.: The Nondrainage Treatment of Peritonitis, *New York State J. Med.* 35: 49 (Jan. 15) 1935. Rhodes, G. K., and Fernald, John: Peritonitis and Drainage, *California & West. Med.* 42: 79 (Feb.) 1935.

5. David, V. C., and Sparks, J. L.: Peritoneum as Related to Peritonitis, *Ann. Surg.* 88: 672 (Oct.) 1928.

From the University of Kansas Hospitals, Kansas City, Kan.
Read in the Surgical Division of the General Scientific Meetings at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

1. Reid, M. R.: The Appendicitis Problem, *Surgery* 3: 601 (April) 1938.

A careful selection of cases for operation is necessary. The presence or absence of intestinal distention aids much in the decision. When there is no distention, operation is usually successful. When diffuse infection, abdominal distention, rapid pulse and dehydration are present, conservative nonoperative treatment is the choice.

DECOMPRESSION OF THE DISTENDED INTESTINE

Any rational treatment of intestinal distention must be considered from the standpoint of the effect of such distention on the organism. Is distention a part of nature's protective mechanism or is it evidence of an advanced pathologic condition? Certainly the degree of distention with reduction of peristaltic activity must be considered in estimating the condition of the patient. When auscultation of the abdomen reveals intestinal sounds, peristalsis is present in some degree. Audible peristalsis is a more hopeful sign than a completely silent abdomen. As distention develops, the blood supply of the bowel is reduced by intraluminal pressure. Excessive distention causes tissue destruction or gangrene. Absorption from the intestine is diminished as the intestine distends. Toxic products may be absorbed through the peritoneum when the blood supply to the intestinal wall is destroyed. Decompression of the intestine prevents necrosis of tissue from lack of blood supply, prevents peritoneal absorption and aids in maintaining the tone of the intestinal muscle. This treatment is then effective by preventing dangerous complications due to overdistention during the height of the infective process.

Continuous gastric and duodenal nasal suction as described by Wangenstein⁶ is indicated in the treatment of intestinal distention resulting from peritonitis. The problem is not unlike that of intestinal obstruction. Constant suction through an indwelling nasal tube removes not only the liquid content of the bowel but the equally important gas and swallowed air that are always present. As signs of improvement in the patient's condition develop, the indwelling tube may be used for testing the return of function of the stomach and intestine. By clamping the tube for a period of two or three hours and measuring the intake and output of liquid, one can make an estimation of function. If the aspirated liquid is less than the intake, it may be assumed that peristalsis is again active and the tube may be removed. While the tube is in place the patient may be permitted to drink water and other liquids, which will pass freely through the tube. Drinking and chewing gum add much to the patient's comfort by satisfying thirst and keeping the mouth moist.

The Miller-Abbott⁷ double lumen tube is useful in emptying the entire small intestine above an obstruction and is applicable to the treatment of intestinal distention due to peritonitis. After the technic of its use has been mastered, excellent results may be expected with this type of tube drainage.

The principal danger of continuous suction treatment of the stomach and upper part of the intestinal tract is the reduction of essential secretions, especially the chlorides. Ulceration in the stomach and esophagus and infection of the middle ear in babies have been mentioned as complications of the indwelling tube. The advantages of the tube far outweigh its disadvantages, and the latter are mentioned only as a safeguard.

The use of enterostomy as a means of decompressing the distended intestine complicating diffuse peritonitis is somewhat questionable. When decompression is most needed the intestine has usually lost its propulsive power and when such a condition exists only a short segment will be drained by enterostomy. After peristalsis has been restored, drainage of the intestinal content is not needed. When true organic obstruction or adhesive obstruction has developed with active peristalsis, enterostomy may be indicated. Organic occlusion requires surgical release, whereas acute inflammatory adhesions causing obstruction will usually subside after temporary drainage and permit restoration of intestinal function. High jejunostomy is no more efficient than suction drainage and is not indicated in the treatment of peritonitis.

Under the heading of intestinal decompression and drainage may also be considered the use of enemas. Liquids given in quantity by rectum, when the intestine is inactive, are frequently difficult to expel and may increase distention and discomfort. Animal experiments have shown that the solutions usually employed for enemas do not stimulate peristalsis in the small intestine and therefore would not aid in reducing its distention.⁸ When the critical stage of the disease has passed and intestinal function has begun to be restored, small enemas may be given with benefit. The colon tube may be useful in any stage of the disease to aid in removing gas from the colon.

MAINTENANCE OF THE INTESTINAL TONE

To maintain the intestinal tone is to maintain the intestinal circulation. The decompression methods discussed obviously aid in maintaining and restoring intestinal tone. Morphine is known to stimulate rhythmic contractions of the intestinal muscle and raise the muscle tone as evidenced by increased intraluminal pressure.⁹ Morphine may then be given with assurance in the treatment of peritonitis not only to increase the muscle tone but in sufficient quantity to make the patient comfortable, promote rest, relieve anxiety and minimize thirst. Overdosage signals are cyanosis and respirations below 15 per minute. When the patient begins to improve, morphine should be promptly diminished and when peristalsis has been restored it should be discontinued entirely. Since hypertonic sodium chloride solutions stimulate intestinal tone and peristalsis, it is reasonable to believe that by maintaining the blood chlorides at a normal level the tone of the intestinal musculature will be favorably influenced. To prevent overdistention of the bowel with its resulting disturbed circulation and at the same time to avoid disturbance of the efforts of the body to protect itself against infection is the principle of such treatment.

USE OF PERISTALTIC STIMULANTS

In view of the generally accepted opinion concerning the protective mechanism of diminished intestinal activity in peritoneal infections, the use of any stimulant which will produce active peristalsis during the acute stage of the disease may be considered harmful. Some clinical evidence has been presented which seems to negative this point of view. Potter¹⁰ has used doses of 1 cc. of pitressin intramuscularly, beginning at the time of operation and given thereafter every

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6. Wangenstein, O. H.: The Early Diagnosis of Acute Intestinal Obstruction with Comments on Pathology and Treatment, *Tr. Western S. A.*, 1931, p. 483.

7. Miller, T. G., and Abbott, W. O.: Intestinal Intubation: A Practical Technic, *Am. J. M. Sc.* 187: 595 (May) 1934.

two to four hours until intestinal tone has been regained. Brown¹¹ has expressed doubt about the protective mechanism of intestinal distention against infection and has recommended peristaltic stimulants at the first sign of toxic intestinal paralysis. Since the value of such stimulants is somewhat controversial, they should be used with discrimination. A fall in blood pressure with evidence of shock after the use of pitressin and prostigmine has been observed. When used, the dosage should be small at first and increased if reaction is not noted. The blood pressure is a valuable guide in controlling the patient's tolerance. Indiscriminate use of peristaltic stimulants in all cases of intestinal distention is bad therapy. Further and more scientific research in the clinical application of these preparations is very desirable.

MAINTENANCE OF WATER AND CHEMICAL BALANCE

Since vomiting and inability to assimilate liquids when given by mouth occur with peritonitis, dehydration and loss of essential secretions of the upper part of the gastrointestinal tract assume great importance. When vomiting is excessive, hypochloremia, disturbed acid-base balance and nitrogen retention may result. These changes can be determined by chemical analysis of the blood, which should be done in all cases of serious illness from peritonitis. After a few days of inability to take food, nutritional disturbances may ensue with lowering of the total blood protein, predisposing to general edema and edema of the lungs.¹²

The disturbance in water and chemical balance is best treated by parenteral administration of sodium chloride and dextrose solutions. Ringer's or Hartman's solution may be used, if preferred, instead of physiologic solution of sodium chloride. Sufficient sodium chloride should be given to maintain the chloride content of the blood at a normal level. The quantity of water and chloride necessary will vary with individual patients. Since the daily liquid intake of the average normal adult patient is from 2 to 3 liters, it is reasonable to assume that the sick patient will require at least similar quantities. Coller and Maddock¹³ have quite accurately estimated that a sick patient showing definite signs of dehydration has lost liquid approximately equal to 6 per cent of his body weight. A patient weighing 60 Kg. would therefore require 3,600 cc. of water to combat existing dehydration. To this should be added in the first twenty-four hours of treatment 2,000 cc. to replace the insensible loss through the skin and lungs during that period, plus 1,500 cc. to make up the normal urine output. The total liquid requirement for the seriously dehydrated patient in the first twenty-four hours would equal the sum of 3,600 cc. plus 2,000 cc. plus 1,500 cc., or 7,100 cc. After the initial dehydration has been corrected, the daily necessary intake of liquid will usually not exceed 3,500 cc. When the water deficiency of any patient is estimated, the quantity lost by vomiting or suction, bleeding, drainage from fistulas, diarrhea and massive exudate must be determined and a like quantity restored to the body. As the patient improves and begins to retain liquid and food taken by mouth, the parenteral intake should be proportionately decreased.

As a practical plan for administering the estimated 3,500 cc. of water required in twenty-four hours, it

is suggested that 2,000 cc. of solution be given by vein in the forenoon and 1,500 cc. by hypodermoclysis in the afternoon and evening. Patients who absorb solutions slowly when given by hypodermoclysis should receive the entire daily quantity by vein. The injection of solution should be discontinued before 11 p. m. so that rest during the night will not be disturbed.

Proctoclysis is a time-honored method of supplying liquid to ill patients and undoubtedly has definite merit in selected cases. However, when given to the patient sick with peritonitis it may increase existing distention and discomfort. It is also frequently difficult to estimate accurately the quantity absorbed by the body, since unknown quantities may be expelled about the intake tube or with bowel movements. Proctoclysis is therefore considered inferior to parenteral methods of administration of liquid, especially during the acute stage of peritonitis with abdominal distention.

It is possible to give a patient too much water and sodium chloride. Clark¹⁴ has called attention to the danger of overburdening a weakened circulatory system by rapidly increasing the blood volume. General edema and edema of the lungs may result with excessive hydration when the solution given contains too much sodium chloride. At the first sign of edema the sodium chloride intake should be reduced or discontinued and the injected solution continued as a 5 per cent dextrose solution. Coller and his associates¹⁵ have determined that for each hundred milligrams per hundred cubic centimeters which the plasma chlorides need to be raised to reach the normal the patient should be given 0.5 Gm. of sodium chloride per kilogram of body weight. If this rule is followed and frequent estimations of the blood chlorides are made, the danger of excessive chloride intake will be reduced to a minimum.

FOOD SUPPLY

To maintain metabolic balance during the destructive activity of disease would approach the ideal in therapy. Since this is not possible, especially in diseases of the gastrointestinal tract which prohibit the normal intake of food, parenteral feeding must be used as a poor substitute. At present dextrose is the food of choice which may be given safely intravenously or hypodermically. It is usually given by vein in a 5 or 10 per cent solution. A 5 per cent solution of dextrose is isotonic and may also be given by injection under the skin. Dextrose is particularly valuable in supplying liver glycogen and stimulating diuresis. Recognition of the importance of liver and kidney damage in many disease conditions has emphasized the therapeutic value of dextrose.

Very recently Mueller¹⁶ has recommended the intravenous administration of a 5 or 10 per cent solution of alcohol in the treatment of peritonitis. The alcohol is added to the dextrose and saline solutions to furnish additional, much needed calories. He estimates that 2 liters of 5 per cent dextrose will supply about 400 calories, and if 100 cc. of alcohol is added nearly twice as many calories are available.

Solutions injected intravenously should be given slowly, usually at a rate not exceeding from 60 to 80 drops a minute. The rate of administration of hypodermoclysis must be governed by the rate of

11. Brown, H. P.: Peristalsis and Peritonitis, *Ann. Surg.* **100**: 167 (July) 1934.

12. Jones, C. M., and Eaton, F. B.: Postoperative Nutritional Edema, *Arch. Surg.* **27**: 159 (July) 1933.

13. Coller, F. A., and Maddock, W. G.: The Water Requirements of Surgical Patients, *Ann. Surg.* **98**: 952 (Nov.) 1933.

14. Clark, J. H.: Acute Cardiac Dilatation: Ever Present Danger in Intravenous Injections, *J. A. M. A.* **89**: 21 (July 2) 1927.

15. Coller, F. A.; Bartlett, R. M.; Bingham, D. L. C.; Maddock, W. G., and Pedersen, Svend: The Replacement of Sodium Chloride in Surgical Patients, *Ann. Surg.* **108**: 769 (Oct.) 1938.

16. Mueller, Sterling: The Use of Alcohol Intravenously with Special Reference to Its Value in Severe Peritonitis, *S. Clin. North America* **19**: 401 (April) 1939.

absorption. Excessive tumefaction of the tissues should be avoided. Discomfort may be minimized by adding 50 cc. of 0.5 per cent procaine hydrochloride solution to each liter of liquid to be injected.

LOCAL APPLICATION OF HEAT

Judging by clinical observations, the application of moist or dry heat to the abdomen is of value in the treatment of peritonitis. Experiments have shown that heat at a temperature usually applied clinically will penetrate the abdominal walls of children and thin adults.¹⁷ Ochsner¹⁸ believes that heat stimulates peristalsis. Patients are often made more comfortable by heat applied to the abdomen. Heat may also favorably influence the blood supply to the peritoneum. The dangers of heat therapy are almost nil if the skin is adequately protected against blistering.

ANTITOXIC SERUM THERAPY

Serums have been used with apparent benefit by some authors.¹⁹ Because of the great variety of organisms which may infect the peritoneum from the gastrointestinal tract, the use of polyvalent serums, antitoxic to all pathogenic bacteria causing peritonitis, would be necessary to estimate the true value of such treatment. To date, the benefit derived from serum therapy has not been sufficiently convincing to warrant its routine use.

CHEMOTHERAPY

The value of specific drug therapy is yet to be determined. Sulfanilamide and the newer allied chemicals have not yet proved their worth in the treatment of peritonitis.

BED POSTURE

The semisitting and Fowler positions increase vital capacity and add to the patient's comfort. What effect such positions have on localizing infection in the lower part of the abdomen is difficult to determine. It is possible that gravity may be a factor in preventing the extension of the infection from the lower to the upper part of the abdomen, especially before distention and plastic exudates limit the spread of liquid infectious material.

OXYGEN THERAPY

A certain degree of anoxemia develops in patients with peritonitis as a result of reduced vital capacity, intestinal distention and toxemia. Oxygen should be given to such patients early in the treatment and not as a last resort after cyanosis has developed and dissolution is imminent. Fine and his associates²⁰ have made the important observation that the administration of high concentrations of oxygen promote the absorption of gas from the distended intestine. The importance of oxygen therapy has been emphasized by Thalheimer,²¹ who has stressed the conclusions of Haldane that mild degrees of anoxemia have serious effects on the nervous system and that moderate or severe degrees may be fatal. Oxygen may be given by nasal tube. If the end of the tube is properly placed in the oropharynx, a flow of 6 liters of oxygen a minute will furnish a 50 to 60 per cent concentration to the patient.

17. Carlson, H. E., and Orr, T. G.: The Penetration of Moist Heat Applied to the Abdomen and Its Effect on Intestinal Movements, *Arch. Surg.* 30: 1036 (June) 1935.

18. Ochsner, Alton: Postoperative Treatment Based on Physiologic Principles, *South. Surgeon* 4: 197 (June) 1935.

19. Priestley, J. T.: Further Observations on Serum Therapy in Treatment of Peritonitis Secondary to Appendicitis, *Proc. Staff Meet., Mayo Clin.* 11: 213 (April 1) 1936. Gundel, M., and Süssbrich, F.: Ergebnisse weiterer klinischer und mikrobiologischer Untersuchungen über die Peritonitis und ihre Serumphylaxe und -therapie, *Klin. Wchnschr.* 13: 1238 (Sept. 1) 1934.

20. Fine, Jacob; Sears, J. B., and Banks, B. M.: Effect of Oxygen Inhalation on Gaseous Distention of the Stomach and Small Intestine, *Am. J. Digest. Dis. & Nutrition* 2: 361 (Aug.) 1935.

21. Thalheimer, William: When Is Oxygen Therapy Indicated and How Is It Best Given? *Mod. Hosp.* 38: 105 (Feb.) 1932.

BLOOD TRANSFUSIONS

If the disease is prolonged or if anemia develops, transfusions are indicated. Inability to take protein foods by mouth soon causes nutritional disturbances resulting in a decrease in the total blood proteins which predisposes to edema. Transfusions cannot be given in sufficient quantity to restore the blood protein to normal but may be of definite value as a supporting measure.

COMMENT

Since treatment of acute peritonitis is still somewhat controversial in some of its aspects, positive or unqualified statements concerning methods of therapy would hardly be justifiable. Published mortality rates, which vary from 1.5 to 50 per cent, indicate that there has not been a uniform understanding of the pathology of peritonitis and its complicating disturbances of physiology and chemistry. The impression is gained by reading statistical reports that too much emphasis has been placed on total mortality rates and not enough on the segregation of similar pathologic processes with an accurate estimate of the death rate in each group.

Much of the treatment outlined here is unnecessary in mild types of peritonitis. In the fulminating types of infection any treatment may fail. Uniformity of opinion concerning the treatment of peritonitis cannot develop unless a uniformity of pathologic states is considered by every one studying the subject.

315 Alameda Road.

Council on Physical Therapy

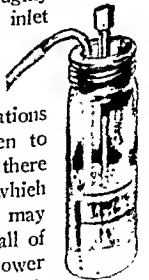
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

AIRCO OXYGEN HUMIDIFIER ACCEPTABLE

Manufacturer: Air Reduction Sales Company, 181 Pacific Avenue, Jersey City, N. J.

The Airco Oxygen Humidifier is designed to humidify oxygen administered to patients by the oropharyngeal method. When the oxygen passes through the wash bottle, it contains sufficient water vapor not to dry the mucous membrane of the pharynx or larynx at the point where the catheter rests.

The unit consists of a cylindrical bottle, roughly 6 by 15 cm., with tubes attached to a special inlet and outlet to lead from the oxygen tank to the patient. The inlet tube is incorporated in the cap and extends nearly down to the bottom of the cylinder. There are a number of perforations at the distal end of the tube to allow oxygen to bubble through. In addition to an outlet tube there is also incorporated in the cap a spring valve which serves to limit the amount of pressure which may be built up inside the glass cylinder. On the wall of the bottle are lines designating the upper and lower level to which the bottle should be filled with water.



Airco
Oxygen
Humidifier.

If the container is properly filled to the level indicated, there is no danger of blowing water over into the delivery tube. This holds true with oxygen flows of from 4 to 10 liters per minute. (One rarely, if ever, uses more than 8 to 10 liters per minute with a nasal or oropharyngeal catheter.) If the bottle is filled to the top level, the relative humidity of the oxygen delivered ranges from 35 to 50 per cent, with from 4 to 6 liters of oxygen flow per minute.

The humidifier was tested in a clinic acceptable to the Council and found to function adequately. The relative humidity

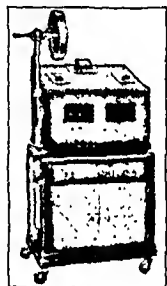
of the oxygen delivered is somewhat low, but no injurious clinical effects were observed. No pharyngitis was seen or other irritation attributable to insufficient humidity. The amount of humidity required for nasal or oropharyngeal administration of oxygen is an individual problem with each patient anyway. The unit was used interchangeably with another humidifier of known efficiency and no clinical difference was observed. The volume of water is rather small and must be replenished frequently.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Airco Oxygen Humidifier for inclusion in its list of accepted devices.

LIEBEL-FLARSHEIM IMPROVED SW2-C STANDARD MODEL SHORT WAVE GENERATOR ACCEPTABLE

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati.

This unit is similar to the Liebel-Flarsheim SW2-C Model Short Wave Generator previously accepted by the Council (*THE JOURNAL*, Nov. 23, 1935, p. 1682) except that it has been improved to allow for an increase in power output. It is recommended for medical and minor surgical purposes. Applications may be made by inductance cable, treatment drum, cuffs, pads and orificial electrodes, and the unit may be employed to induce fever for hyperpyrexia treatments.



Liebel-Flarsheim Improved SW2-C Standard Model Short Wave Generator.

The unit is supplied in a portable wooden cabinet with separate subcabinet and in this form the net weight is about 76 pounds and the shipping weight is about 110 pounds. It is also supplied optionally in a one-piece all metal cabinet and in this form the net weight is 163 pounds and the shipping weight is 265 pounds.

Two oscillator tubes are utilized in a tuned plate, tuned grid, circuit generating a wavelength of about 22.6 meters. The patient, cable and drum circuits are inductively coupled to the oscillator. A filter is employed in the supply line for the purpose of minimizing line feed-back for possible radio interference. The circuit also incorporates a device which protects the oscillator tubes from overload and gives an audible signal when the unit needs readjustment. An electric fan provides forced-draft ventilation.

The firm submitted engineering data to support its claim for the power output of the machine. This is as follows:

Calorimetric Method.—The temperature rise induced in a given amount of water in a given time indicates an average output of 465 watts on the pad circuit and 470 watts on the cable circuit, with an input of 1,160 watts and 1,175 watts respectively.

Photoelectric Cell Method.—Two 300 watt bulbs were arranged in parallel. Measurement of light indicated an average on the cable circuit of 540 watts output with 1,185 watts input, and on the pad circuit 495 watts output with 1,180 watts input.

Tests were carried out for the Council to substantiate these claims. Three separate calorimetric tests were carried out with the apparatus, and the results showed that the claimed output of 470 watts at an input of 1,160 watts could be obtained readily.

The unit was operated at full load for two hours. The transformer temperature rise was found to be low enough to meet the requirements of the Council.

To provide evidence as to the functioning of the machine in heating the human body, the firm submitted a series of tests performed in a reliable clinic.

Treatments were given for twenty minutes each in accordance with the patient's tolerance. For the coil technic, four turns of the cable were wrapped around the thigh with approximately 1 inch spacing of turkish toweling. Two turns were taken high up on the thigh, then about 4 inches of spacing was allowed for inserting the thermocouples, and two more turns were taken below the incision. When the treatment drum was used it was applied over the thigh, as close to the skin and as nearly over the point where the temperatures were read as the

thermocouples would permit. For the cuff technic, two cuff electrodes with approximately one half inch of felt spacer under each were wrapped around the thigh with about 4 inches spacing between the proximal edges.

A Chapman orificial electrode also was used. This electrode was drilled out so that a thermometer could be passed through

Average Temperatures of Six Observations

	Deep Muscle, Degrees F.		Oral, Degrees F.	
	Initial	Final	Initial	Final
Coil technic	98.6	106.3	98.6	98.9
Treatment drum technic	98.4	105.8	98.5	98.8
Cuff technic	98.0	105.3	98.4	98.8

and be in actual contact with the cervical tissue, giving temperature readings from the cervix and not the interior portion of the electrode. A large short wave pad was used as the

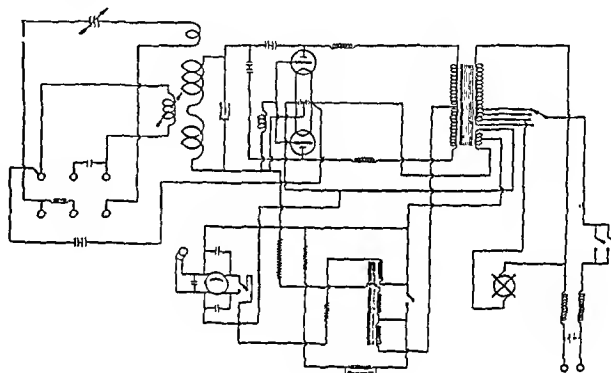


Diagram of circuit.

dispersive electrode and was spaced 2 to 3 inches from the lower part of the abdomen by means of a folded turkish towel. The thermometer was left in position throughout the treatment. The duration of each treatment was thirty minutes.

Average of Six Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
101.5 normal	110.2

Nine other tests were made at another hospital, giving the results shown in the table.

Average of Nine Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
98.6	109.6

In addition, eight fever treatment charts were submitted as evidence of the efficacy of the unit in supplying heat for hyperpyrexia. The Liebel-Flarsheim Fever Cabinet was used.

Average of Eight Observations

Initial, Degrees F.	Time Required to Reach 106 F.
97.9	1 hour 41 minutes

The unit was tried in a clinic acceptable to the Council. It was found to give satisfactory service and to perform in accordance to the claims submitted by the manufacturer.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Liebel-Flarsheim SW2-C Improved Standard Model Short Wave Generator for inclusion in its list of accepted devices.

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SATURDAY, OCTOBER 14, 1939

SIGMUND FREUD: 1856-1939

On September 22, in his eighty-third year, Sigmund Freud, founder of psychoanalysis, died in London. Men in the future may evaluate fully his contribution to medicine. No doubt much of his teaching will be modified and some of it will be discarded. Certain, however, is the revolutionary influence he has had on psychiatry. Freud was born in 1856 in Freiberg, a small provincial town of Moravia, then belonging to the Austro-Hungarian Empire, a son of simple Jewish parents. His nationality and his race influenced his career. He became a physician though later confessing that his secret desire had been to become a novelist. He was destined to be a profound student of human nature.

In his medical studies Freud was stimulated far more by Charcot and Bernheim in France than by his Viennese teachers. The Vienna Medical School was dominated by the mechanistic attitude of Virchow's cellular pathology. In the light of that concept the unity of the human being as manifested in the functioning of the highest integrating centers (personality) was lost. Freud began his medical career as a neurologist, with contributions on aphasia and on infantile cerebral palsy. Like many of his contemporaries, he soon became aware of the sterility, ineffectiveness and fundamental inadequacy of current neurologic practice in the care of the neuroses. In a search for more light he went to Charcot, whose fame was then at its peak. Charcot had demonstrated experimentally that ideas can produce bodily symptoms. By hypnotic suggestions he had succeeded in reproducing artificially in his patients hysterical symptoms similar to those of which they complained spontaneously.

From Bernheim's and Liébeault's post-hypnotic experiments in Nancy Freud learned that unconscious psychologic processes may influence overt behavior. Next came the observations of Joseph Breuer in Vienna, with whom Freud collaborated after his return from France. The real discoverer of psychoanalysis was Breuer's famous patient Anna, who began to talk

freely under hypnosis of forgotten experiences. This reminiscing while under hypnosis was not simple remembering. It involved a dramatic display and expression of repressed emotions. This verbal outburst of emotions in hypnosis, which had such a beneficial effect on Anna's hysterical symptoms, Freud and Breuer called "cathartic hypnosis"; Anna herself gave it the name "talking cure."

These two factors, remembering of forgotten traumatic emotional experiences and the expression of pent up emotions, have remained two important therapeutic factors in psychoanalysis. Cathartic hypnosis, however, lacked one important element of modern psychoanalytic technic: insight, the intellectual digestion of the repressed forgotten emotional experiences. Under hypnosis the conscious personality of the patient was entirely eliminated. Freud recognized this defect of hypnotic therapy. He tried to reproduce the procedure without hypnosis and during these attempts discovered the most fundamental dynamic fact of psychology—the fact of repression and resistance. In the waking state patients could not face these repressed emotions which came to the surface in hypnosis. Our resistance toward the recognition of emotions, wishes and tendencies which are painful and in conflict with accepted standards Freud called repression. During patient experimentation between 1895 and 1900 Freud discovered the method of free association by which he was able to circumvent the emotional resistance of patients against facing and recognizing their unconscious motive forces. In free association, conscious control is eliminated. The patient gives free course to his ideas, which drift—now converging toward, now receding from, the pathogenic repressed material. During this procedure, more and more of the unconscious repressed material becomes conscious. The physician's role is not active. His influence on this process of self revelation consists mainly in increasing the patient's courage and confidence to face his real self. Now sexual matters, which had been shunned by physicians and patients but which are nevertheless a significant part of our lives, began to become apparent as determining factors in some psychologic disorders. Challenging the hypocritical attitude of his time, Freud described sexual phenomena objectively. The first rejection with which his views were met was mainly due to the publication of these discoveries.

The aim of psychoanalysis, as Freud conceived it, was not to tell people unpleasant truths about themselves but to cure patients by giving the integrative powers of their rational and conscious personality an opportunity to deal with those psychologic forces which were excluded from their conscious mind. Most important was the discovery that repressions may go back to early childhood, when the infantile ego is too weak to deal with the onslaught of violent emotions. Under certain conditions, when these repressions are too excessive, the repressed impulses find a morbid outlet in

neurotic and psychotic symptoms: irrational fears and ideas, depressions, delusions and the whole gamut of psychopathologic phenomena. Psychoanalytic therapy is based on the principle that the mature conscious ego can deal with repressed emotions which the childish ego cannot tolerate.

Most shocking to contemporary attitudes was the discovery of what Freud called the "family tragedy." Naturally, the first emotional difficulties in which the child becomes involved concern its parents. The typical combination of love and hate which the small child feels toward his parents Freud called the "Oedipus complex." More recently, the application of psychoanalysis to children has become a source of important information about early emotional and intellectual development.

The emotional reactions to the freudian observations and formulations made objective evaluation extremely difficult. They permeated scientific discussions and developed strange accusations. Freud was accused of pansexualism, mysticism, dogmatism and unsound speculation. Moreover, Freud was held responsible for every vagary of his actual disciples and many a pseudoscientist who claimed to speak in his name. He was a pioneer working in an unknown territory—the dynamics of the mind; naturally his first generalizations were somewhat vague groping attempts. Nevertheless many of his observations have already passed the test of scientific scrutiny. The facts of repression, resistance, transference, infantile sexuality and its typical manifestations in family life, the unconscious emotional origin of psychoneurotic and many psychotic symptoms, the principal laws of psychodynamics as observed in such mechanisms as rationalization, projection and overcompensation form the basis of both normal and morbid psychology.

Sigmund Freud was 35 years old when he returned from Paris to Vienna and laid the foundations of psychoanalysis. Failing to be accepted and supported by his colleagues in Vienna, including at last even Breuer, he worked for ten years entirely alone. Gradually a few students began to gather around him. Among these early followers were Karl Abraham, Sandor Ferenczi, Max Eitingon, Karl Jung, Alfred Adler, Wilhelm Stekel, Otto Rank, Hans Sachs, Ernest Jones, and others whose names did not become so well known. Some of these pupils were unwilling to follow completely along the untrodden paths into which Freud was leading them. Chief among these dissenters were Jung, Adler and Rank. Yet already psychoanalysis has become firmly established in psychology, in education and in medicine. The technic of psychoanalytic therapy has become standardized and is taught to psychiatrists in psychoanalytic institutes. A number of well trained psychoanalysts are united in scientific societies. The effects of emotional factors on physiologic and pathologic processes are being studied by adequate methods. Such generalities as worry, fear and

overwork as causes of physical disturbances are being replaced by precise descriptions of the emotional factors. By this pathway Freud's influence on general medicine will be most felt in the future. But his influence on our times cannot be evaluated by restricting attention to the medical implications of his teachings alone. All the scientific fields which deal with man's relation to man and all the social sciences have received a new impetus from his dynamic psychology.

DISTRICT COURT IN TEXAS RULES STATE MAY REQUIRE CITIZEN- SHIP IN LICENSURE OF PHYSICIANS

Citizenship may lawfully be required by the state of Texas of an applicant for a license to practice medicine, as a condition precedent to the issue of a license, in the opinion of the district court of Travis County, Texas, in a case brought by a citizen of Mexico.¹ Such a requirement was held not to deprive an alien of any right guaranteed him by the federal constitution. As far as available records show, this is the first time that a court has been called on to pass directly on this question. Under the provisions of the constitution a state cannot deny to an alien the right to follow a "common occupation" under the same conditions that it imposes on citizens. The practice of medicine, the Texas court observed, is not "a common occupation" but is a profession impressed in many instances with semiofficial duties.

Physicians have duties in connection with many important matters relating to the public welfare: duties in connection with governmental birth, sickness and death records; with the execution of certificates of inability of witnesses, or even of the defendant, to attend trial; with matters relating to communicable diseases and quarantine; with the execution of certificates of freedom from disease, required by law in connection with the issuance of marriage licenses, and with the enforcement of state and federal narcotic laws, and many other duties of similar nature. All these duties are imposed on physicians by the government in the furtherance of policies adopted by the state for the welfare of the people as a whole. A physician who is a citizen will be better able to cooperate with the state in carrying out its policies than a physician of foreign allegiance and training who is unfamiliar with the ideals and institutions of our country.

In epidemics, the court pointed out, the closest cooperation is required between the medical profession and various governmental agencies. The virtual end of epidemics of many diseases, such as cholera and smallpox, has resulted from the close partnership that has been maintained between the practicing physicians and

1. Manuel Garcia-Godoy v. State Board of Medical Examiners (Texas), in the District Court of Travis County, Texas, 53d Judicial District, No. 61938.

administrative agencies of the state and federal governments. For the preservation of gains that have been made and in the furtherance of similar objectives, the court thought that the legislature had a perfect right to declare it to be of utmost importance that the practice of medicine be limited to citizens. Again, in time of war the services of physicians constitute a necessary and most important link in our fighting forces; the court thought that physicians who have not signified a belief in the fundamental ideals of this country would be in a position to exert a subversive influence tending to undermine and destroy those ideals and to thwart the attainment of the objectives for which we might

be fighting. For these and other reasons the court felt that it was within the police power of the state to deny to aliens the right to practice medicine to the end that public health, safety and morals might be furthered and preserved.

The court, incidentally, expressed great difficulty in understanding why Texas had ever permitted examinations for medical licensure to be conducted in any language other than English, believing a thorough knowledge of our language to be of prime importance to a physician if he is fully to understand the information imparted by a patient and if he is adequately to give instructions to that patient.

CITIZENSHIP AS A CONDITION PRECEDENT TO MEDICAL LICENSURE IN THE UNITED STATES¹

Numerous alien physicians, and particularly physicians from Germany and the nations it has taken over, have been coming into the United States during recent years for permanent residence. In some states difficult

Germany and Austria.² During the following fiscal year, which ended June 30 last, immigrant physicians numbered 1,384, of whom 819 came from Germany, which during that year included the area formerly known as Austria. During the fiscal year 1931, immigrant physicians numbered 329, while during the fiscal year 1939, just ended, they numbered 1,384.

Statutes and Regulations Governing License to Practice

Citizenship Required		First Papers Required		Neither Citizenship nor First Papers Required
By Statute	By Regulation of Medical Examining Board	By Statute	By Regulation of Medical Examining Board	
Arkansas ¹ Delaware ¹ Florida Georgia ² Idaho Louisiana ³ Nebraska New Hampshire ⁴ New Jersey South Dakota Texas Wyoming	Alabama ¹ Iowa ⁵ Kansas Kentucky Michigan Minnesota ⁶ Missouri Montana Nevada North Carolina Oklahoma South Carolina Tennessee Washington West Virginia	Connecticut Illinois ⁷ Massachusetts ⁸ New Mexico New York ⁹ Pennsylvania Rhode Island ¹⁰ Wisconsin ¹¹	Colorado ¹² Maine Maryland ¹² Mississippi North Dakota Ohio Oregon Utah Virginia	Arizona California District of Columbia Indiana Vermont

1. In Alabama and Delaware, citizenship is required of graduates of foreign medical schools.

2. In Georgia, persons who had resided in the state for at least three months prior to March 23, 1939, who were graduates of a medical school approved by the Association of American Medical Colleges or the State Board of Medical Examiners of Georgia, who had practiced in a foreign state or country for at least twenty years and who had filed first citizenship papers may be issued temporary permits valid for six years. If at the end of that period full citizenship is not obtained, no further license may be issued.

3. In Louisiana, temporary permits may be issued to applicants who have taken out first naturalization papers. By board ruling, licentiate must obtain full citizenship within the time limit prescribed by the federal law on penalty of withdrawal of temporary permit.

4. In New Hampshire, citizenship is required of all applicants except citizens of "a Canadian province in which like privilege is granted to citizens of the United States."

5. In Iowa, citizenship is required of graduates of foreign medical schools, except Canadian schools.

6. In Minnesota, citizenship is required of all applicants except citizens of Canada.

7. In Illinois, the law provides that an applicant shall have obtained first citizenship papers "or having made such declaration of intention, has filed a petition for naturalization within thirty days after becoming eligible to do so."

8. In Massachusetts, licentiate must complete naturalization within five years or else the license is revoked.

9. In New York, licentiate must obtain full citizenship in ten years or else his license is revoked.

10. In Rhode Island, by board regulation, licentiate must obtain full citizenship within five years.

11. In Wisconsin, the law provides that an applicant who by reason of his nationality is ineligible to citizenship, who was a graduate of a reputable professional college in the United States prior to June 22, 1933, and who possesses all other qualifications to secure a license, at least one of whose parents is a native of Wisconsin, shall be licensed.

12. In Colorado and Maryland, first citizenship papers are required of graduates of foreign medical schools.

situations have been created. During the eight federal fiscal years immediately preceding June 30, 1938, 3,165 immigrant physicians arrived, of whom 1,221 came from

How and where these 4,549 alien physicians are now located, what they are doing and what their prospects are of establishing themselves in the practice of their profession, if they have not already done so, is not known. Those who have not yet become United States

1. The data in the table and accompanying it, so far as they relate to statutory requirements, have been compiled by the Bureau of Legal Medicine and Legislation from the statutes of the several states. The data relating to regulations promulgated by state boards of medical examiners have been compiled from information supplied the Council on Medical Education and Hospitals of the American Medical Association by the boards of medical examiners of the several states.

2. Immigration of Alien Immigrant Physicians, J. A. M. A. 112:737 (Feb. 25) 1939.

citizens or even taken out first papers are confronted by statutes and regulations which, except in four states and the District of Columbia, will bar them from licenses to practice. The various statutes and regulations in force governing the matter are herein briefly summarized.

Current Comment

PITUITARY EXTRACT AND LABOR

Although the use of pituitary extract after delivery and in some instances during the final stage of labor has become almost a routine procedure, the questions relating to its indications or possible harmfulness have not yet been settled. Recent reports serve to reopen this important problem. Williams¹ studied fifty normal primiparas given solution of posterior pituitary immediately after the birth of the child and fifty controls treated in exactly the same manner except for the pituitary. Curiously the incidence of postpartum hemorrhage was more than doubled in the pituitary extract series, although the number of patients was too small to warrant definite conclusions on the etiologic role of the drug. There was an average reduction of about five minutes in duration of the third stage of labor for the pituitary group. One contraction ring was encountered, but whether this was due to uterine manipulations or pituitary extract could not be stated. Percival² observed the effects of the intramuscular injection of 5 units of solution of posterior pituitary immediately after the birth of the child in sixty-nine cases of labor. During the same period seventy-four control cases were observed and recorded under similar conditions. He also emphasized that the number of cases studied was too small for the results to carry conviction. As far as the investigation has gone, the intramuscular injection of 5 units of solution of posterior pituitary directly after the birth of the child showed that the duration of the third stage was not appreciably affected, the average loss of blood was less, the incidence of postpartum hemorrhage was less and also there was no tendency for the chorion to be retained; there was no tendency for a contraction ring to form and there was no case of pituitary shock. Clayton³ found, however, that the average duration of the third stage was slightly shorter in cases in which pituitary was given, that the incidence of postpartum hemorrhage of more than 20 ounces (600 cc.) was not reduced and that there is danger of hour glass spasm of the uterus with the ensuing risk of manual removal of the placenta. The definitely uncertain results of the administration of solution of posterior pituitary as obtained by these observers indicate the need for reviewing the entire question of its routine administration. If pituitary extract can be demonstrated to be without the desired effect and even harmful, it should certainly be omitted as a routine procedure in spite of its present wide acceptance and use.

1. Williams, B. L.: The Effects of Injection of Pituitary Extract Immediately After Delivery, *Proc. Roy. Soc. Med.* 32: 920 (June) 1939.

2. Percival, R. C.: On The Effects of Pituitary Extract (Posterior Lobe) in the Third Stage of Labor, *Proc. Roy. Soc. Med.* 32: 923 (June) 1939.

3. Clayton, S. G.: The Effects of Injections of Pituitary Extract Immediately After Delivery, *Proc. Roy. Soc. Med.* 32: 926 (June) 1939.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Seventh Course on Postgraduate Study.—The committee on postgraduate study of the state medical society offered its seventh course at the University of Arkansas School of Medicine, Little Rock, October 10-11. The speakers included:

- Dr. Barnett P. Briggs, Chronic Nontuberculous Infections of the Respiratory Tract.
- Dr. Robert Lee Hoffmann, Kansas City, Mo., After Urinary Antiseptics: What About Kidney Infections?
- Dr. Paul F. Stookey, Kansas City, Mo., Diagnosis and Treatment of Meningitis.
- Dr. Oliver C. Melson, The Role of the Internist in the Care of Patients with Thyroid Disease.
- Drs. George V. Lewis and Carl A. Rosenbaum, Surgical Treatment of Hyperthyroidism.
- Dr. William R. Brooksher, Fort Smith, Ark., Roentgen Irradiation in the Treatment of Toxic Goiter.
- Dr. Edgar V. Allen, Rochester, Minn., Occlusal Disease of the Peripheral Arteries.
- Dr. Robert L. Schaefer, Detroit, Clinical Indications of Anterior Pituitary-like Sex Hormone.
- Dr. Stuart P. Cromer, dean, The Medical School in a Program of Graduate Medical Instruction.
- Dr. Paul C. Williams, Dallas, Texas, A Classification of the Arthritides: A Clinical Demonstration.
- Dr. Joy K. Donaldson, Appendicitis: Errors in Management and Educational Needs.
- W. E. Hutchison, D.D.S., A Dentist Talks to Physician Friends.
- Drs. Paul L. Mahoney and John S. Agar, Effects of Drugs in the Nose.

CALIFORNIA

Lectures on Family Relations.—A series of lectures on family relations is being offered at the University of California in Wheeler Auditorium, Berkeley, Tuesday afternoons at 4 o'clock. The lectures are designed among other things, to clarify personal and emotional factors associated with sex and human relations, to survey objectively a demonstrable situation regarding sex and society and to consider means of applying this knowledge to individual and social welfare. Chauncey D. Leake, Ph.D., professor of pharmacology at the university's medical school, will direct the series.

Lectures on Mental Hygiene.—The Mental Hygiene Society of Northern California will present a series of lectures on "Mental Health in Action" at the Mount Zion Auditorium, San Francisco. The speakers will be:

- Dr. Walter L. Treadway, U. S. Public Health Service, San Francisco, October 18, The Poor, the Sick, the Bad.
- Ernest R. Hilgard, Ph.D., Stanford University, October 25, Motives in Industry.
- Dr. Herbert E. Chamberlain, Sacramento, November 1, Mental Hygiene in Daily Life.
- Dr. Jacob Kasanin, San Francisco, November 8, Psychoanalysis and Mental Health.
- Norman Fenton, Ph.D., Stanford University, Calif., November 15, Mental Hygiene and the Teacher.

DISTRICT OF COLUMBIA

University News.—Dr. George W. Thorn, Baltimore, lectured before the naval medical and dental officers on duty in the District and vicinity October 9 on "Supportive Treatment of Infections."

New Department of Psychology and Psychiatry.—The Catholic University of America, Washington, recently created a department of psychology and psychiatry under a grant from the Rockefeller Foundation. The work of the department of psychology, which had been in existence since the founding of the university, has been extended to form the department of psychology and psychiatry. Dr. Thomas V. Moore is head of the department.

Society News.—The Urological Society of the District of Columbia will be addressed by Drs. James T. Priestley, Rochester, Minn., November 8, on "Surgical Procedures in Urology."—At a meeting of the Washington Heart Association November 15 Dr. Tinsley R. Harrison, Nashville, Tenn., will discuss recent advancements in the study of hypertension and renal disease.—Dr. Nolan D. C. Lewis, New York, addressed the section on gastro-enterology of the Medical Society of the District of Columbia October 2 on "The Nervous and Mental Signs of Gastrointestinal Disorders."

ILLINOIS

Postgraduate Instruction in Down State Cities.—A new program of postgraduate education has been adopted by the Illinois State Medical Society which will include several one-day conferences to be held in certain cities of the state. The first conference will be held at the Dunlap Hotel, Jacksonville, November 9, with the following program given by Chicago physicians:

Dr. Robert S. Berghoff, Heart Disease.
Dr. Warren H. Cole, General Surgery.
Dr. Cleveland J. White, Dermatology.
Dr. Philip H. Kreuscher, Orthopedic Surgery.
Dr. Julius H. Hess, Pediatrics.
Howard J. Shaughnessy, Ph.D., Public Health.
Dr. James H. Hutton, Endocrinology.
Dr. Frederick H. Falls, Obstetrics.

Each paper will be followed by discussions. Additional details may be obtained from Dr. Frank Garm Norbury, Jacksonville, or Dr. Berghoff, 30 North Michigan Avenue, Chicago.

Chicago

Seminars on Psychologic Problems.—Dr. Franz Alexander, director, Institute for Psychoanalysis, will conduct the first of a series of five seminars for physicians on "Psychologic Problems in General Medical Practice" October 17. Other lecturers will be:

Dr. Helen Vincent McLean, October 31, Neurotic Gains from Illness.
Dr. Thomas M. French, November 14, Psychologic Aspects of Asthma.
Dr. Leon J. Saul, November 28, Psychologic Aspects of Hypertension.
Dr. Therese Benedek, December 12, Premenstrual Emotional Difficulties.

Clinical Heart Session.—The clinical section of the Chicago Heart Association will hold its first meeting of the season at Michael Reese Hospital October 27. Among the participants will be Dr. Soma Weiss, professor of medicine, Harvard Medical School, Boston. Subsequent meetings of the section will be held monthly at one of the heart clinics of the city. Questions should be sent to Dr. Clayton J. Lundy, secretary of the clinical section, Chicago Heart Association, 203 North Wabash Avenue.

Technical Adviser Appointed on Industrial Hygiene.—Dr. Ludwig Teleky, formerly of Düsseldorf, Germany, has been appointed technical adviser to the division of occupational hygiene of the state department of public welfare, where he will be associated with Dr. Milton H. Kronenberg, chief of the division. Dr. Teleky graduated at the University of Vienna in 1896. He has served as honorary secretary of the Austrian Central Organization for Prevention of Tuberculosis and editor of its journal and as medical expert in the Workers Accident Insurance of Vienna and Lower Austria. In 1939 Dr. Teleky was awarded the Devoto prize of the Reale Istituto Lombardo di Scienze and letters in Milano for the best publication in industrial hygiene.

Society News.—At a meeting of the Chicago Laryngological and Otolological Society October 2 the speakers were Drs. Chevalier L. Jackson, Philadelphia, on "Surgical Treatment of Cancer of the Larynx" and Elmer W. Hagens, "Pathology of the Inner Ear in a Case of Deafness from Cerebro-Spinal Meningitis."—The Illinois Psychiatric Society was addressed October 5 by Max K. Horwitz, Ph.D., and Drs. Erich Liebert and George A. Wiltrakis, Elgin, Ill., on "Metabolism of the Brain Before and After Insulin and Metrazol Treatment as Determined by Oxygen and Carbon Dioxide Content of the Blood"; Maxwell Gitelson, "Concerning the Direct Psychotherapy of Children," and Jules H. Masserman, "Use of Phantasy Tests in Differential Psychiatric Diagnosis."—Dr. Ernest A. Pribram discussed "Management of Diabetes Based on Modern Conception of Carbohydrate Metabolism" before the German Medical Society of Chicago October 3.

Rush College to Be a Graduate School.—Plans are under way to establish a center for graduate training at Rush Medical College within the near future. This announcement was made simultaneously with the news that undergraduate work will be discontinued at Rush in 1942, to provide completion of training for the class entering the autumn session in 1940. Undergraduate training will be continued at the Department of Medicine of the University of Chicago, and after 1942 will be offered there exclusively. The board of managers of Presbyterian Hospital, the teaching unit of Rush, has voted that the hospital remain in its present location on the west side of Chicago. According to a release from the school, decision to establish Rush as a center of graduate medical training terminates discussions as to the ultimate status of Rush, which have been carried on intermittently since 1916. In that year the university approved plans for the south side school which was opened in the autumn of 1927. Rush was chartered in 1837 and has been in operation since 1842, merging with the University of Chicago in 1924 after twenty-six years' affiliation.

KANSAS

Cancer Program.—A statewide lay education program on skin cancer will be carried out during 1939-1940 under auspices of the Kansas Federation of Women's Clubs, Women's Field Army of the American Society for the Control of Cancer and the Kansas Medical Society. An effort will be made to present programs in every town in the state with the local county medical society participating.

Society News.—The Shawnee County Medical Society was addressed in Topeka October 2 by Dr. Paul C. Colonna, Oklahoma City, on "Diagnosis and Treatment of Acute Hematogenous Osteomyelitis."—At a meeting of the Golden Belt Medical Society in McPherson October 12, the speakers were Drs. Letteer G. H. Lewis, McPherson, on "Vitamin K in Relation to Biliary Tract Disease"; Murray C. Eddy, Hays, "Management of Gallbladder and Biliary Tract Disease from the Standpoint of the Surgeon"; Cecil D. Snyder, Winfield City, "Gastric Surgery," and Francis A. Carmichael Jr., Kansas City, "Low Back Pain from the Standpoint of the Neurosurgeon."

MAINE

Annual Fall Clinic.—The Maine Medical Association will hold its annual fall clinical session at Waterville October 25-26. Meetings will be held at the Sisters, Thayer and Elm City hospitals. Wednesday evening there will be a panel discussion on modern anesthesia with the following speakers: Drs. Frederick T. Hill, Waterville, chairman; Howard M. Clute, Marion Fletcher Eades and Sidney C. Wiggins, New York. Gilbert Clapperton, Lewiston, and Paluel J. Flagg, Boston. The session Thursday evening will be the regular meeting of the Kennebec County Medical Society, with Dr. Elliott C. Joslin, Boston, discussing diabetes.

MICHIGAN

Society News.—Dr. Lawrence W. Smith, Philadelphia, discussed "Temperature Factors in Cancer and Embryo Cell Growths" before the Wayne County Medical Society October 9. Dr. Russell L. Haden, Cleveland, will speak October 16 on "The Etiology and Diagnosis of Leukemia."

Neurologic Society Changes Name.—At its first annual meeting in Rochester September 28, the Detroit Society of Neurology and Psychiatry officially changed its name to the Michigan Society of Neurology and Psychiatry. The speakers at the meeting included Drs. Louis A. Schwartz on "An Analyzed Case of Hypertension" and James Clark Moloney, "Comments on the Unconscious."

Field Consultant in Pediatrics.—Dr. Warren E. Wheeler, Dayton, Ohio, has been appointed to the staff of the bureau of maternal and child health of the state department of health as field consultant in pediatrics. His services will be available to local health departments and medical societies on request. The appointment of Dr. Wheeler is a part of the state society's program of postgraduate education for physicians throughout the state (THE JOURNAL, August 5, p. 517). Dr. Wheeler graduated at Harvard Medical School, Boston, in 1933.

MINNESOTA

Society News.—The Minnesota Academy of Medicine was addressed in St. Paul October 11 by Dr. Lee W. Barry on the various types of cesarean section.—Dr. James S. Reynolds, Minneapolis, discussed blindness before the Hennepin County Medical Society at its first meeting of the season in Minneapolis October 2.—At a meeting of the Minneapolis Surgical Society October 5 Dr. Arthur R. Metz, Chicago, spoke on "Chronic Duodenal Stasis."—Dr. Jens E. Meulengracht, Copenhagen, discussed "Principles Underlying the Treatment of Hemorrhagic Peptic Ulcer" in a Mayo Foundation lecture in Rochester August 31. Dr. Meulengracht is chief of Bispebjerg Hospital and professor of medicine at the University of Copenhagen.

MISSOURI

New Trachoma Hospital.—The cornerstone of the Missouri Trachoma Hospital, Rolla, was laid recently. Speakers included Dr. Arthur T. McCormack, Louisville, commissioner of health of Kentucky, and Governor Lloyd Stark. The Missouri State Medical Association was represented by Dr. Eldon C. Bohrer, West Plains. The hospital is located west of Rolla on a five acre tract. When completed it will be the largest hospital of its kind in the world.

pleted, the T shaped building will have a capacity of seventy beds with laboratories, equipment for visual training, recreation and assembly room. It will cost \$136,000.

Society News.—At a meeting of the St. Louis Medical Society September 26 the speakers were Drs. Louis L. Turcotte and John Althert Key on "Fractures of the Vertebrae During Metrazol Therapy"; Paul O. Hagaman, "Treatment of Streptococcal Infections," and William B. Kountz, "Treatment of Peripheral Vascular Diseases."—Drs. Alexis F. Hartmann and Henry L. Barnett, St. Louis, discussed sulfanilamide before the Jackson County Medical Society September 26.—Dr. Thomas G. Miller, Philadelphia, will address the Kansas City Academy of Medicine October 20 on "Recent Advances in Gastroenterology."—At a meeting of the Kansas City Southwest Pediatrics Society September 19 the speakers were Drs. Francis A. Carmichael Jr. and Edwin H. Schorer on "Diagnosis of Cerebral Conditions in Childhood" and "The Business Side of Pediatrics" respectively.—Dr. Thomas M. Paul, St. Joseph, discussed "The Physiologic Basis for the Therapeutic Effects of 'Splenic Extract'" before the Buchanan County Medical Society, St. Joseph, October 4.

NEW JERSEY

Society News.—Dr. William Goldring, New York, will address the Academy of Medicine of Northern New Jersey, Newark, October 19 on "Clinical Aspects of Hypertension and Arterial Heart Disease." Dr. John H. Garlock, New York, will address the section on surgery October 24 on "Surgical Treatment of Carcinoma of the Thoracic Esophagus."

Changes in State Board of Health.—Drs. Frederick P. Lee, Paterson, and Walter G. Alexander, Orange, have been appointed members of the state board of health. Robert P. Fischelis, Phar.D., secretary of the state board of pharmacy, has also been appointed a member of the board under a new law increasing the membership to include a registered pharmacist.

NEW YORK

Society News.—Capt. Rollin L. Bauchspies, M. C., U. S. Army, assistant professor of military science and tactics, Syracuse University School of Medicine, addressed the Onondaga County Medical Society, Syracuse, October 3 on "Medical Service of the U. S. Army in the Field."—Drs. Joseph R. Wiseman and David F. Gillette, among others, will address the Syracuse Academy of Medicine October 17 on "Drug Allergy with Specific Reference to Trypsinamide."—Drs. Gordon D. Hoople, Syracuse, and Marguerite P. McCarthy, Solvay, addressed the Allergy Society of Syracuse October 11 on "Bronchoscopy in the Diagnosis and Treatment of Asthma" and "Analysis of Results in Treated Hay Fever Patients at the Allergy Clinic" respectively.—Dr. Norman H. Jolliffe, New York, addressed the Medical Society of the County of Nassau, Garden City, September 26 on "Recent Advances in Vitamin Therapy (Vitamin B Complex)."—Dr. Philip L. Forster, Albany, addressed the Medical Society of the County of Albany September 27 on "Fat Embolism."—Dr. John H. Ferguson, Syracuse, addressed the annual joint meeting of the Syracuse Academy of Medicine with the Utica Academy of Medicine at the Teugega Golf Club in Rome September 21 on "Crime Detection and the Doctor."

New York City

First Harvey Lecture.—Dr. Arne W. K. Tiselius, Uppsala University, Uppsala, Sweden, will deliver the first Harvey Society Lecture of the current series at the New York Academy of Medicine October 19 on "Electrophoretic Analysis and the Constitution of Native Fluids."

Medicine in Newspaper Forum Program.—One session of the ninth annual Forum on Current Problems sponsored by the New York *Herald-Tribune*, which will be held at the Waldorf-Astoria October 24-26, will be devoted to "Science on the Side of Civilization." Arthur H. Compton, Ph.D., professor of physics, University of Chicago, will give the keynote address, and the other speakers will be Drs. Perrin H. Long, Baltimore, on the development of sulfanilamide in treatment of disease; Francis Carter Wood, New York, progress in the treatment and control of cancer, and Allan Roy Daboe, Callander, Ont., physician to the Dionne quintuplets, "Better Citizens Through Stronger Children."

The Twelfth Graduate Fortnight.—The twelfth Graduate Fortnight of the New York Academy of Medicine will be held October 23 to November 3. The subject will be "The Endocrine Glands and Their Disorders." There will be round table

conferences at the academy building each morning and clinics at hospitals in the afternoons. Evening sessions will be held at the academy with the following speakers:

- Dr. Herbert M. Evans, Berkeley, Calif., Historical Sketch of the Development of Endocrinology.
- Dr. James B. Collip, Montreal, Can., Physiology of the Anterior Lobe of the Pituitary Gland.
- Dr. Leopold Lichtwitz, New York, Pituitary Hypothalamic Syndromes.
- Dr. Leo M. Davidoff, Brooklyn, Hypopituitarism and Hyperpituitarism.
- Dr. Elmer L. Sevringhaus, Madison, Wis., Therapeutic Application of Female Sex Hormones.
- Dr. David Marine, New York, Physiology and Principal Interrelations of the Thyroid.
- Dr. James H. Means, Boston, Hypothyroidism.
- Dr. Harold Thomas Hyman, New York, Medical Aspects of Hyperthyroidism.
- Dr. Frank H. Lahey, Boston, Surgical Treatment of Hyperthyroidism and Other Diseases of the Thyroid Gland.
- Dr. Walter B. Cannon, Boston, The Adrenal Medulla.
- Dr. Robert F. Loeb, New York, Adrenal Insufficiency.
- Dr. Cyril N. H. Long, New Haven, Conn., The Adrenal Cortex.
- Dr. Bernard S. Oppenheimer, New York, The Cushing Syndrome: Neoplasms of the Adrenal Gland.
- Dr. Hugh H. Young, Baltimore, Overfunction of the Adrenal Cortex.
- Dr. Rollin T. Woodyatt, Chicago, Relation of Diabetes to the Endocrine System.
- Dr. John F. Fulton, New Haven, Conn., The Influence of the Central Nervous System upon Endocrine Activity.
- Dr. William G. MacCallum, Baltimore, Physiology and Pathology of Parathyroids.
- Dr. Henry L. Jaffe, New York, Hyperparathyroidism.
- Philip E. Smith, Ph.D., New York, Physiology of the Ovaries.
- Carl R. Moore, Ph.D., Physiology of Testes and Therapeutic Application of Male Sex Hormones.
- Dr. Robert T. Frank, New York, Puberty, Menstruation and Pregnancy.
- Dr. Ephraim Shorr, New York, Menopause.

Several of the programs for the evening sessions were arranged in cooperation with other medical societies and sections of the academy.

NORTH CAROLINA

Symposium on Diseases of the Lungs.—A three day symposium on diseases of the lungs and thorax will be held at Duke University School of Medicine and Duke Hospital, Durham, October 19-21. The speakers will include:

- Dr. Edward C. Churchill, Boston, Anatomical and Physiological Considerations Involved in the Surgical Treatment of Intrathoracic Lesions.
- Dr. Frederick T. Lord, Boston, Clinical Aspects and Diagnosis of Pulmonary Lesions.
- Dr. Daniel M. Brumfiel, Saranac Lake, N. Y., Pneumoconiosis.
- Dr. Chester A. Stewart, Minneapolis, Evolution of Tuberculosis in Children.
- Dr. Harry A. Bray, Ray Brook, N. Y., Clinical Diagnosis of Early Pulmonary Tuberculosis.
- Dr. Cameron Haight, Ann Arbor, Mich., Surgical Treatment of Pulmonary Tuberculosis.
- Dr. William DeW. Andrus, New York, Mediastinal and Other Thoracic Tumors.
- Dr. Isaac A. Bigger, Richmond, Va., Trauma to the Thorax.
- Dr. Charles R. Austrian, Baltimore, Medical Treatment of Suppurative Diseases of the Lungs.
- Dr. Dickinson W. Richards Jr., New York, Pulmonary Fibrosis and Emphysema: Recent Methods of Diagnosis and Treatment.
- Dr. William F. Rienhoff Jr., Baltimore, Surgical Treatment of Lung Abscess and Bronchiectasis.
- Dr. Stuart W. Harrington, Rochester, Minn., Clinical Manifestations and Surgical Treatment of Diaphragmatic Hernia.
- Dr. Maxwell Finland, Boston, Treatment of Pneumonia.
- Dr. Daniel C. Elkin, Atlanta, Ga., Postoperative Pulmonary Complications.
- Dr. Gabriel Tucker, Philadelphia, Bronchoscopy in the Diagnosis and Treatment of Intrathoracic Disease.

OREGON

Society News.—Dr. Conrad A. Loehner, Salem, addressed the Lane County Medical Society, Cottage Grove, September 17 on "Barbiturates and Hypnotics."—Dr. Peter H. Rozendal, Klamath Falls, was elected president of the state association of city and county health officers at the annual meeting in Portland September 1-2. Drs. David R. Rich, La Grande, and Walter H. MacDougall, Oswego, were elected vice presidents and A. Edward Bostrom, Portland, reelected secretary.

Lectures by Dr. Goodpasture.—A series of lectures will be given by Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, Tenn., before the Portland Academy of Medicine October 23-25. His subjects will be: "Investigations of Virus Infections and Immunity by Means of Chick Embryo Technique"; "Experimental Bacterial Infections of the Chick Embryo," and "A Consideration of Pathogenesis of Virus and Bacterial Infection, with a Review of Some Virus Diseases."

PENNSYLVANIA

Personal.—Dr. Tom Outland, Sayre, Pa., has been appointed chief surgeon at the Elizabethtown State Hospital for Crippled Children to succeed Dr. James R. Martin, who was appointed James Edwards professor of orthopedic surgery at Jefferson Medical College, Philadelphia (*THE JOURNAL*, August 26, p. 866).—Dr. Theodore Wollak, superintendent of the Torrance State Hospital, Torrance, since 1936, has resigned, it is reported.

Society News.—Dr. Carl J. Wiggers, Cleveland, addressed the Washington County Medical Society, Washington, September 13 on "Physiology in the Practice of Medicine."—At the first fall meeting of the Dauphin County Medical Society, Harrisburg, September 5 the speakers are Drs. Ross H. Childerhose, on "Diagnostic Features and Modern Medical Treatment of Tuberculosis"; William Devitt, Allenwood, "Surgical Treatment of Tuberculosis," and Clarence R. Phillips, "Proper Relationship Between the Lay Organization and the Medical Society."

UTAH

Dr. Freudenberger Named Acting Dean.—Clay B. Freudenberger, Ph.D., professor of anatomy, University of Utah School of Medicine, Salt Lake City, has been appointed acting dean during the absence of Dr. Lyman L. Daines, dean, who has been seriously ill since early in September. News at the university includes the promotion of Dr. Edward I. Hashimoto as assistant professor of anatomy, and the construction of an addition to the medical school building which will increase the facilities by 50 per cent, it is reported.

Hobby Show.—The Salt Lake County Medical Society devoted its meeting September 11 to a hobby show. Under the leadership of Dr. Fuller B. Bailey, the following, among others, displayed their work: Drs. George A. Allen "Live Birds"; Quince B. Coray, "Painting and Charcoal Drawings"; Orlando L. Ross, James Albert Peterson and Edward S. Pomeroy, "Water Colors and Paintings," and Thomas F. Welsh and Ralph C. Pendleton, "Photography."

State Medical Election.—Dr. Alfred C. Callister, Salt Lake City, was chosen president-elect of the Utah State Medical Association at a meeting of the house of delegates at the University of Utah, Salt Lake City, September 4. Other officers include: Drs. Warren O. Christenson, Wellsville, Edwin M. Neher, Salt Lake City, Wilford J. Reichmann, St. George, David E. Ostler, Richfield, vice presidents; David G. Edmunds, Salt Lake City, secretary; Richard P. Middleton, Salt Lake City, treasurer. The next meeting of the state association will be held in Ogden in 1940.

Control of Venereal Disease.—The state department of health has established a bureau of venereal disease control to cooperate with the U. S. Public Health Service in launching a statewide program. Dr. Welby W. Bigelow, Salt Lake City, has been named director of the bureau. Subsidized by federal funds, the state board has adopted a revised system of reporting venereal diseases, and the distribution of free antisyphilitic drugs for indigents and those in low income groups is being made available to regularly licensed physicians. To facilitate reporting as well as free antisyphilitic drug distribution to the private physicians, a system has been set up whereby the physicians will report cases to and receive drugs from their respective district health officers except in Davis and Salt Lake counties. Physicians in these counties will apply respectively to the Davis County health department at Farmington and to the state board of health in Salt Lake City. District health offices are located at Ogden, Cedar City, Price, Provo and Richfield.

GENERAL

Reprints on Infantile Paralysis.—A limited number of bulletins entitled "Care During the Recovery Period in Paralytic Poliomyelitis" are available for distribution by the National Foundation for Infantile Paralysis. No charge will be made. The association is sending copies to members of the American Academy of Orthopedics and the American Orthopedic Association, but interested physicians may have them on request. The brochure is technically designated "Public Health Bulletin No. 242, Revised 1939," U. S. Public Health Service. Requests should be directed to the foundation at 120 Broadway, New York.

Leaflet for Patients Explains Gonorrhea.—The U. S. Public Health Service has issued a leaflet entitled "Gonorrhea the Crippler," designed for physicians to distribute to their patients. The division of venereal diseases prepared it in response to a recommendation by an advisory committee in January 1938, urging the development of a campaign for education of the public and issuance of printed materials. The text

explains the symptoms, points out the fallacies of several common beliefs and gives practical advice, with emphasis on care by a physician. This folder is one of a "dollar-a-hundred" series on venereal disease published by the service. It is available from the Superintendent of Documents, Washington, D. C., at \$1 a hundred copies.

Aero Medical Meeting.—The eleventh annual meeting of the Aero Medical Association of the United States will be held at Hollywood-by-the-Sea, Florida, November 3-5, with headquarters at the Hollywood Beach Hotel. The speakers on the scientific program include:

Dr. Charles L. Leedham, Randolph Field, Tex., The Syndrome of Vasomotor Instability as Seen in Examination of Cadet Applicants for Flying.

Ross A. McFarland, Ph.D., Boston; Dr. Ashton Graybiel, Boston; Dr. Eric Liljencrantz, San Francisco; Col. Arnold D. Tuttle, Chicago. An Analysis of the Physiologic and Psychologic Characteristics of Two Hundred Civil Air Line Pilots.

Lieut. Comdr. William W. Davies Jr., Pensacola, Fla., Some Observations on Cadet Selection.

One feature of the program will be a forum on airline medical problems.

Meeting of Health Officers.—The annual institute of instruction on the practical administrative affairs of the health officer will constitute the yearly session of the International Society of Medical Health Officers in Pittsburgh October 16. The session will be in cooperation with the health officers' section of the American Public Health Association. Among the speakers will be:

Edward Henry Lewinski Corwin, Ph.D., The Problem of Cost Accounting in Public Health.

Dr. Huntington Williams, Baltimore, Practical Staff Policies of a Health Department.

Dr. John L. Rice, New York, Increasing Administrative Efficiency.

Henry F. Vaughan, Dr.P.H., Detroit, Organizing the Health Department for an Epidemic.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., will speak.

New Society of Physical Therapy Physicians.—Dr. Frank H. Ewerhardt, St. Louis, and Dr. William Bierman, New York, were chosen president and president-elect respectively of the Society of Physical Therapy Physicians at its organization and first annual meeting during the annual session of the American Congress of Physical Therapy in New York September 5-8. Other officers include Drs. Frank H. Krusen, Rochester, Minn., and John S. Coulter, Chicago, vice president and secretary-treasurer respectively. Although the group met informally in 1938, the society was not officially organized until the recent meeting. Its membership will be restricted to physicians who devote themselves exclusively to the practice of physical therapy in contradistinction to those of the American Congress of Physical Therapy, which includes all ethical physicians and surgeons who are interested in physical therapy while engaged in general practice. The membership will be limited to 100 bona fide specialists who have devoted at least five years to this specialty and have or are holding teaching and directoral positions in physical therapy in America. Membership will be offered to qualified men by individual invitation, according to the *Archives of Physical Therapy*. The 1940 session will be held separately but during the annual session of the congress at Cleveland.

Government Services

Physicians Wanted for the CCC

Vacancies now exist in the CCC in the eighth corps area wherein the services of physicians can be utilized as civilian employees (physicians) or as contract physicians. Applicants should be graduates of approved medical schools and should address their applications to the surgeon, eighth corps area, Fort Sam Houston, Texas. Consideration will be given to applicants as follows: (1) Medical reserve officers who are eligible for active duty and promotion. They may be placed on duty under classification P-2 at the initial rate of pay of \$2,600 per year. (2) Physicians who are not members of the medical reserve corps can be placed on duty as contract physicians at the initial rate of pay of \$2,600 per year. Applicants must consider themselves physically qualified; if selected, they must report to their first place of assignment at their own expense and if found physically qualified will be appointed at the respective rates. If on being relieved from duty, either at the request of the individual or for the convenience of the government, the return transportation must also be at the expense of the individual.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 23, 1939.

The London Hospitals in Wartime

The London hospitals have been cleared as far as possible of ordinary patients, mainly with the object of transferring them to places safer from air raids and also to provide accommodations for the large number of casualties expected from this cause. But they still maintain 20 per cent of their accommodations for cases of urgent illness or casualties apart from air raids. One restriction is imposed: only cases from the district in which the hospital is situated are admitted. In normal times the reputation of the hospitals drew patients from far and wide, even from overseas. Operations are now performed in rooms specially equipped on the lower floors. A limited outpatient service is maintained. The enormous medical machine which was created almost overnight for the treatment of casualties from air raids is kept "ticking over." In certain directions medical services are necessarily curtailed. The use of radium is an example. Most of the national stock of radium has been buried at the foot of a 50 foot hole specially drilled for use in war time at one of the hospitals. The radium and its containers are in a steel cylinder, which before being lowered was loaded at the well head by an operator who stood for protection behind a thick block of lead. This valuable stock of radium is thus protected against risk of accident not only with the object of preserving it but as a safeguard against the damage which might be caused if it should be scattered by an explosion. For the present, high voltage roentgen therapy will be used instead of radium treatment wherever possible. The resumption of radium treatment in some parts of the country will soon be considered.

The Use of Poison Gas and Bacteria in War

In the House of Lords, Viscount Halifax, Secretary of State for Foreign Affairs, stated that the British ambassador in Berlin, when asking for his passports from the German government, presented a note inquiring whether the Geneva Gas Protocol of 1925, which prohibits the use of poisonous gas and bacteriologic methods, would be observed by the German government. That government had now replied in the affirmative through the Swiss minister in London as follows: "The German government will observe for the duration of the war the prohibitions which form the subject of the Geneva Protocol. It reserves full liberty of action in the event of the provisions of the protocol being infringed by the enemy." But we are taking no risks in this matter. Not only the fighting forces but every civilian has a gas mask, and in London no one goes any distance without taking his mask. There are special ones for young children and for babies, who could not wear an ordinary mask, a protective helmet in which air is kept circulating by a bellows. Instruction in the use of this helmet is given daily to mothers at the centers for air raid precautions.

The Need for Pharmaceutic Reform

At the British pharmaceutic conference Mr. J. Rutherford Hall referred in his presidential address to the misleading and fraudulent advertisements of nostrums which the government did not control in any way. There was need for some central authority to recognize proper and reliable medicaments. A combination of the British Pharmacopoeia and the United States Pharmacopoeia might be the first stage in securing a Universal Pharmacopoeia. But this did not solve the whole difficulty in settling what were proper and reliable medicaments. New drugs and methods of treatment were being constantly introduced.

Some standing authority was therefore necessary, with power to act and make recognitions and regulations as occasions arose. He had in mind some such body as the Council on Pharmacy and Chemistry of the American Medical Association, which published an approved list of new and nonofficial remedies, the purpose of which was to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicines. Such a body, to be effective, would need legal sanction.

The welter of names and the confused nomenclature of medicaments called loudly for some simplification. The same substance should not be put on the market under different proprietary names. There should also be some limit to the putting up of known substances under a proprietary name and so overloading the pharmacy shelves. The public was protected against poisoning by the Pharmacy and Poisons Act, which confined the sale of poisons to duly qualified pharmacists. There was a strong case for much wider control. It would be in the interest of the community that the dispensing and distribution of all medicaments should be similarly confined to pharmacists. Though they might know little or nothing about pathology and should not presume to diagnose or prescribe, they knew enough to be able to warn a purchaser that the article he wanted was contraindicated.

Red Cross Relief Fund

The British Red Cross Society has issued an appeal for funds, stating that in this war it is certain there will be vast suffering and distress and that the relief of the sick and wounded of the fighting forces and of the civilian population will call for much voluntary effort and financial support. Considerable voluntary help has already been secured, but it remains to find the money necessary to pursue the work. In the great war and indeed at all times appeals made by the British Red Cross Society have obtained a good response. Though the fund was opened only a few days ago, \$375,000 has already been subscribed. Individual donations are as high as \$5,000.

Royal College of Surgeons Takes Precautions Against Air Raids

The more valuable contents of London's museums, libraries and art galleries which would be irreplaceable if destroyed by air raids have been removed to places of safety in basements or to the country. The world-famous Hunterian collection of surgical specimens at the Royal College of Surgeons has been removed to a bomb-proof vault in the college basement. All the more important manuscripts, books and pictures in the college library have been sent to the country.

BERLIN

(From Our Regular Correspondent)

Aug. 24, 1939.

Meeting of Neurologists and Psychiatrists

The Society of German Neurologists and Psychiatrists met this year in Wiesbaden. The president, Professor Rüdin, Munich, pointed out that psychiatry in its efforts for improving racial hygiene performed a timely and progressive service. He credited psychiatry with having been the first division of medicine to point out to the state and the national socialist party the dangers latent in psychopathic persons and to give impetus to the well known legal measures taken. It is fallacious to assume, he said, that psychiatry would become increasingly superfluous, because psychopaths according to the laws governing racial hygiene would soon die out. This assumption involves the danger of deterioration for the psychiatric profession, whereas psychiatry requires the most competent physicians, because it deals with many dangerously ill with hereditary psychoses. "The individual therapist may bungle and mar

one or two human lives, but a poor psychiatrist, whole generations." Rüdín warned against undermining the reputation of psychiatrists.

Scientific attention was given, especially, to the psychic disorders attending advancing years. Max Bürger, the Leipzig clinician, treated the subject from the pathophysiologic point of view. He pointed out, as the basis of his own investigations, that processes characteristic of old age begin in youth and represent a basic phenomenon of life. Ferdinand Kehrer, psychiatrist in Münster, treated the subject from the clinical point of view and presented a systematic account of mental diseases in later life. A. von Braunmühl, Eglfing, Bavaria, showed how precipitations and swellings, modifications in the dispersion rate of the colloidal brain substance and other changes of a colloid chemical nature manifest themselves. G. Gischof-Kutzenberg spoke on the hereditary relations of the psychoses of advancing years. A special position must be accorded to involuntal depressions. Our knowledge, he said, of climacteric and pre-senile psychoses is still fragmentary. Besides, it appears that manic-depressive psychoses that make their first appearance in advancing years require special classifications and do not fit in the frame of hereditary manic-depressive insanity.

Seventieth Birthday of Prof. F. K. Kleine

One of the most deserving of German tropical scientists and for many years collaborator of Robert Koch, Prof. Friedrich Karl Kleine, has celebrated his seventieth birthday, far from his native land, in San Carlos on Fernando Poo (Spanish West Africa), where he is engaged in research work. When an officer in the public health service he was ordered in 1900 to report to the Robert Koch Institute in Berlin, where he soon became a co-worker of Robert Koch in his investigations of the significance of tuberculosis of cattle for human beings. In 1903-1904 he accompanied Koch to Rhodesia and Egypt on the expedition to study coastal fever in cattle and in 1906-1907 to East Africa to study trypanosomiasis. In 1908-1913 Kleine was in charge of the German campaign in East Africa for combating trypanosomiasis and was extraordinarily successful in his scientific activity. The best known result of this activity was the discovery that the agent must pass in the tsetse fly through an evolution similar to that of the malarial parasite in the anopheles mosquito. During the World War Kleine was ranking physician of the German forces in Cameroon. After the war he became divisional director and subsequently president of the Robert Koch Institute for Infectious Diseases in Berlin until his retirement from public service in 1934 on reaching the retirement age. Kleine enjoys an international reputation.

Small Families of Physicians

According to a report that appeared in *Volk und Rasse*, families of physicians are among the smallest of the German population. In 1938 about 21 per cent of the 27,800 physicians of Germany, exclusive of Austria and the Sudetenland, had no children. Fifty per cent had only one or two children; only 23 per cent had three or four children. Large families of five or six children were found in only 4.5 per cent. Conditions in Berlin, Munich and Leipzig were especially bad. Berlin with 32.2 per cent and Munich with 32 per cent showed the largest percentages in marriages without children.

Diabetic Retinitis

Dr. Reinhold Braun has treated diabetic retinitis in a critical examination of the 770 diabetic patients in Professor Umber's ward in the Hospital Westend in Berlin. One hundred and fifteen of these patients had modifications of the retina. Insulin produced no change. Older patients and those with serious diabetes were more frequently affected than younger ones. Of the factors contributing to metabolic disturbances in diabetes, acidosis and the secretion of ketone bodies seem to be most

causative of diabetic retinitis. Perhaps changes in the vascular system of the retina play a part; hypertonia is not involved. Moreover, a certain effect on the evolution of diabetic retinitis seems also to be attributable to the excretory functioning of the kidneys and to disturbances in the sympathetic nervous system and in the balance between the hormones of Langerhans' islands and the chromaffin system. Treatment of diabetic retinitis is almost completely unavailing; however, insulin is in no wise injurious to the retina.

Tuberculosis Among Sailors

The fight against tuberculosis occupies a prominent position in the hygienic welfare work connected with social insurance. The sailors' vocation is not favorable to tuberculous men, but quite the contrary, because of the strenuous work and the constant exposure to cold. Recognizing this the sailors' union about a year ago undertook to examine crews in active service for tuberculosis. About 18,000 examinations have been completed. Hereafter sailors will no longer be employed on German ships without certificates of examination. No charges are made to sailors for these tests.

Professor Riecke's Seventieth Birthday

Prof. Erhard Riecke, dermatologist, completed his seventieth year May 11. He had been full professor since 1920 in the department of dermatology and venerology in Göttingen and recently retired on reaching the retiring age. Riecke made a reputation by the publication of a textbook on cutaneous and venereal diseases, a book that enjoyed numerous editions and is the most widely used German textbook in this field.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 1, 1939.

Social Service in New Zealand

The social security scheme in New Zealand this year will cost £12,000,000, distributed over a population of only one million people. Payments include £6,910,000 in old age benefits, £1,050,000 for invalids, £1,010,000 for widows, £508,000 for sickness benefits, £306,000 for maternity benefits, £738,000 for hospitals, £100,000 for medical expenses and £459,000 for administrative expenses. Of the total cost £5,550,000 will be obtained from wages, £3,050,000 from other income and £2,000,000 from the consolidated fund. The budget has been received with hostility by the business sections of the community. The decision to increase the tax on gasoline by fourpence per gallon and that on beer by sixpence per gallon is particularly unpopular. Prof. A. H. Locker, leading economist, has stated that the budget appears to be mainly a stop gap and that the government is merely deferring the evil day when it will have to face its difficulties.

MATERNITY SERVICES CONTRACTS

After much dissension, the medical profession has now approved by ballot the acceptance of contracts for maternity services, under the social security scheme, and the government has been asked by the profession to legislate to make contracts binding on all practitioners who normally undertake maternity work. The effect will be that all mothers who desire state assistance will have this right, although any who do not wish to take the benefit may make independent arrangements. This decision, however, does not dispose of the larger question, which is still at issue between the British Medical Association and the government over the inauguration of the universal practitioner service. A powerful coercion on the profession may, however, come from the public. Several letters appearing in the press have pointed out that the community is now paying the social security tax but still has to pay for the services of a doctor. The writers suggest that instead of paying for medical

services twice over, as at present, doctors' bills should be ignored in future. If this idea "catches on," the British Medical Association will be forced irrevocably to obey the voice of the people as expressed in a democratic election.

Plumbism and Chronic Nephritis

As long ago as 1892, attention was drawn to the prevalence of lead poisoning among children in Brisbane. It was not until 1929, however, that serious attention was paid to the possible association of plumbism and chronic nephritis. Now the commonwealth department of health has issued a brochure on the subject consisting of a report by Dr. R. Elliott Murray including details of a method for the estimation of lead in biologic materials. At the present time about ninety persons below the age of 30 years and approximately the same number between the ages of 30 and 50 die annually from nephritis in Queensland, in excess of the number that would succumb to the disease were the death rate the same as that of Great Britain. The death rate below the age of 30 years is about the same as it was from 1917 to 1926, but above that age it has been steadily tending to increase. During the same period the annual total death rate from chronic nephritis at all ages has increased from an average of 403.5 to 558 per million of population. Murray has shown beyond doubt that plumbism does occur in children in Queensland. Investigating paint as a source of lead, he found that paint which retained its glossy hard surface would not yield any appreciable amount of lead on being rubbed with saliva moistened fingers. On the other hand, when the paint became weathered the danger rapidly became serious. He makes the observation that a weathered paint containing a low percentage of lead may yield more lead on being rubbed than a paint containing a higher proportion of lead but remaining in a better condition and suggests that the 5 per cent limit to the lead content of paint for veranda railings, gates and fences as enacted in 1923 may still allow dangerous amounts of the material to become available to children after weathering has occurred.

Considering the question whether plumbism is a factor in the causation of chronic nephritis in Queensland, Murray concludes that from a consideration of the past history of cases of nephritis and the later progress of cases of plumbism, together with the results of biochemical examination of nephritis cases, lead poisoning in childhood is a major factor in the causation of the abnormal Queensland incidence of chronic nephritis. Although it would appear possible that it is the sole factor responsible, it cannot be stated dogmatically that such is the case. It would appear probable that any other factor which can cause renal damage could act in conjunction with lead to aggravate the condition. The role of climate with its possible effects on acid-base and mineral metabolism cannot be accurately assessed, but while it may act as an adjuvant to other sources of renal damage there is sufficient evidence to allot to it a major role.

A National Memorial to Sir Truby King

The Royal New Zealand Society for the Health of Women and Children, more commonly known as the Plunket Society, has launched an appeal for a national memorial to its founder, the late Sir Truby King. Such an appeal has the whole-hearted support of the medical profession in New Zealand. It has been decided that £2,000 of the sum obtained shall be set aside to assist in the upkeep and maintenance of the home of Sir Truby King in Wellington, which he bequeathed to the society. A further £2,500 will be invested for the purpose of providing a postgraduate course for nurses trained in the Plunket system of child welfare, while smaller sums will be expended on a monument and a portrait of the founder of the Plunket Society.

It is too soon after the death of Sir Truby King to assess finally and with any accuracy his contribution to medical science. We can, however, pay homage to his personal attri-

butes. His untiring energy and selfless devotion to an ideal were known all over the world. He possessed a genius for organization of a high order, and to a remarkable degree he wielded the power of infusing others with his own enthusiasm. He was held in great honor by members of his profession, and their response to the appeal made by the council of the Plunket Society no doubt will be spontaneous.

Medical School for Queensland

The official opening of the new medical school of the University of Queensland on August 11 marks the final achievement in the campaign for the provision of facilities for medical education in this state. When in October 1936 the Faculty of Medicine was inaugurated, that function marked the successful issue of representations which had their commencement as early as the foundation of the university itself. The first actual proposals in 1913 were interrupted by the outbreak of the great war and shortly after its conclusion in 1922 arrangements were made for anatomic demonstrations to be given to certain of the dental students at the university. By slow degrees from this small beginning grew the skeleton structure of a medical course. In 1936 it was suggested that the inauguration of the faculty was of such importance that even makeshift provision, so far as buildings were concerned, would be better than delay, but the government after due consideration decided to provide buildings worthy of the new venture, and the recently completed medical school is a magnificent tribute to their recognition of its scope and importance. The building is a dignified example of Renaissance architecture and has been designed to incorporate all modern improvements in laboratory and lecture room design.

COPENHAGEN

(From a Special Correspondent)

Sept. 19, 1939.

The Hospital Habit

A generation or two ago it was the rule rather than the exception for residents of Copenhagen to be sick at home. Now most of them, when seriously ill, prefer hospital to home treatment. Support of these remarks is to be found in a study Dr. Povl Heiberg has undertaken with the object of showing how the hospital habits of his fellow countrymen have changed. He has studied his material in five year instead of one year periods to avoid the pitfalls inherent in small figures. In the five year period 1881-1885 only 29 per cent of all the deaths in Copenhagen occurred in hospitals, whereas the corresponding figure for the five year period 1931-1935 was 67 per cent. At the end of the last century only one in every three of the population of Copenhagen died in a hospital, whereas now two in every three do so.

This remarkable change has not been effected in an equal degree by the various diseases responsible for the deaths on record. Hospital treatment for such a disease as croupous pneumonia, for example, is not so much more common now than it was in the five year period 1886-1890, when 26 per cent of all the cases were admitted to a hospital. The corresponding figure for the five year period 1931-1935 was 37 per cent. On the other hand, only 28 per cent of all the deaths from pulmonary tuberculosis between 1896 and 1900 occurred in hospitals, whereas between 1931 and 1935 as great a proportion as 75 per cent did so. Indeed, in the case of syphilis and gonorrhea the tendency seems to be away from inpatient hospital treatment in favor of outpatient hospital treatment. Formerly, every fifth case of scabies was treated in hospitals, whereas now, thanks in large part to the quick efficiency of modern treatment, it is found necessary to provide hospital treatment for only some 3 per cent of these cases. This is just as well, for there are still some 5,000 to 6,000 cases of scabies notified in Copenhagen every year in spite of the compulsory treatment provided for this disease.

Denmark's Dietetic Habits

Dr. Johanne Christiansen, who seems to have become the uneasy dietetic conscience of her country, continues to wage war on her fellow countrymen's sins of omission and commission over the dinner table. Her special aversion is Dr. Hindhede, who did so much a generation ago to promote vegetarianism in Denmark. The duel between these two protagonists has been carried on outside as well as inside Denmark, and in 1934 Dr. Christiansen issued in a German medical journal a pug-nacious article with the ominous heading *Mein Kampf gegen Hindhede*. This autumn she has issued in Danish a fairly comprehensive summary of the faith which is in her. The Danes, she says, are laboring under the most embarrassing handicap of utterly misguided doctrines concerning the very elements of nutrition. They are fed on margarine, bacon, refined sugar and sophisticated flour, whereas what they need in the place of these mischief-making foods are milk, eggs, cheese, meat, fish, fruit, vegetables and wholemeal bread. The Danes in the Middle Ages lacked vitamin C and, before the introduction of potatoes, were subject to scurvy. The Danes of today suffer from a host of ills because natural and protective foods have largely been replaced by artificial foods from factories. As a race, Danes are far too plump, and it is no mere chance that in some Danish hospitals about 10 per cent of all the diagnoses on admission are obesity. It is temptingly easy for the medical profession to cope with this situation by prescribing various vitamin preparations with a view to repairing the mistakes of the menu, but how much more rational it would be to revise the menu and thus to make proprietary vitamin preparations superfluous! When a Dane falls ill, it has heretofore been the practice in hospital dietaries to reduce rather than increase his supply of vitamins, and he has been fed on pappy foods instead of on plenty of milk and on meat soups, which are an excellent vehicle for vegetables. Dr. Christiansen would also like to see her countrymen producing home-brewed beer containing plenty of vitamins B and C. The old Danish custom of mixing home-brewed beer with milk might well, she says, be revived.

Vitamin K Deficiency in Infancy

A good example of effective team work in Copenhagen is to be found in the hospital for children's diseases under Professor Bloch, the University Biochemical Institute under Professor Ege, and the obstetric departments A and B of the Rigshospital under Professor Hauch and Professor Rydberg respectively. The coordinators of this work are Drs. Dam, Tage-Hausen and Plum. Employing the technic elaborated by Dam and Glavind for the quantitative demonstration of prothrombin in the blood, they have succeeded in linking up in a clinical triad the following conditions heretofore regarded as independent of one another: icterus gravis neonatorum, anaemia neonatorum and hydrops congenitus. The connecting link, demonstrable in each case, is a well defined hypoprothrombinemia. Administration of vitamin K to the patients suffering from these conditions was so effective in rapidly raising the quantity of prothrombin in the blood that it seemed likely that these patients must have been suffering from vitamin K deficiency.

Last April a 26 day old boy was admitted to Professor Bloch's hospital suffering from jaundice, anemia and hemorrhages. Vitamin K deficiency being suspected, the rate of coagulation of the blood was investigated, the content of prothrombin in the blood being measured. It proved to be much reduced, and the child was therefore treated with vitamin K. Within a day of this treatment the hemorrhages ceased. This striking observation led to quantitative analyses of prothrombin in the blood of healthy children and others suffering from such conditions as icterus gravis neonatorum, anaemia neonatorum and congenital hydrops. The conclusion drawn from these studies is that under normal conditions there is a shortage of vitamin K

during the first few days after birth. No depot of vitamin K existing in the baby's body at birth, and the supply of this vitamin depending on the mother's milk and bacterial activity in the intestine, this temporary shortage of vitamin K is inevitable and is repaired only after the baby has begun to feed and the normal bacterial activities of the contents of the intestines have set in.

BUCHAREST

(From Our Regular Correspondent)

Aug. 18, 1939.

More Than a Thousand Centenarians in Rumania

The Central Statistical Institute, led by Prof. D. Sabin Manuila, has published a bulky volume with the title "Breviarul Statistic al Romanici." According to this book the number of persons in the kingdom reached in this year the figure of 19,535,398. Of these about 80 per cent, that is 15,926,178, live in villages and the number of the urban population is only 3,609,220. The number of children under 9 years of age is 4,822,698 and of persons from 70 to 80 is 323,355, from 80 to 90 is 61,212 and from 90 to 100 is 8,030. The number of persons over 100 years of age is 1,074. Since the last census in 1930 the birth rate has fallen from 35.2 per thousand to 31.5 per thousand. The death rate, however, did not follow the rate of decrease of the birth rate, decreasing only from 21.2 to 19.8.

Marriages

HENRY FRANZ ALBRECHT JR., Troy, N. Y., to Miss Catherine Elizabeth McArdle of Lawrence, Mass., recently.

JAMES D. SORRY, Madisonville, Ky., to Mrs. Margaret Johnson of Boston at Lexington, Ky., September 16.

WATSON WHARTON, Smithfield, N. C., to Miss Eddythe Hawkins of Johnson City, Tenn., August 17.

CHARLES McCRAW WOOD to Miss Florence Swan, both of Maroa, Ill., at Rochester, Minn., August 15.

SAMUEL A. ALESSANDRA, Dallas, Texas, to Miss Ethel Evelyn Prince of Timpson, September 1.

IVAN VINCENT BAMBERGER, York Haven, Pa., to Miss Myre E. Painter of York, September 20.

EDWARD KIRBY LAWSON, Penbrook, Pa., to Miss Bessie B. Stoner of Philadelphia, August 4.

ERNEST E. WIESNER, Brockton, Mass., to Miss Doris Billings of Lynn, September 8.

ALBAN PAPINEAU, Plymouth, N. C., to Miss Jeannette Edwards of Ayden, August 30.

EDWIN E. MCNIEL to Miss Marjorie Robertson, both of Honolulu, Hawaii, July 16.

ELLWOOD W. GODFREY, Ambler, Pa., to Miss Sophia Moore of Wynnewood, August 28.

WILLIAM N. GILMAN, Wenona, Ill., to Miss Dorris Louise Lec of Normal in August.

GRANT SANGER to Miss Margery Edwina Campbell, both of New York, September 30.

ALFRED A. GELLHORN, St. Louis, to Miss Olga Frederick of Nokomis, Ill., August 4.

JOSEPH MARCOVITCH, Dwight, Ill., to Miss Lillian Ganzer at Brooklyn, September 6.

WALTER J. PHILLIPS, Chicago, to Miss Helen Petkus of Cicero, Ill., August 20.

JOSEPH N. ROSE, Evarts, Ky., to Miss Myrtle A. Kennedy of Harlan, recently.

NATHAN R. ABRAMS to Miss Edna Silverstein, both of Cincinnati, August 20.

HANS SYZ to Miss Emily Sherwood Burrow, both of New York, August 12.

JOEL WRIGHT to Miss Onie May, both of Alpine, Texas, August 6.

Deaths

Harvey Cushing, one of the most distinguished of all surgeons in operative procedures on the brain, recognized as an accomplished author, educator, philosopher and leader, died in New Haven, Conn., Saturday, October 7, of coronary thrombosis. He was the fourth Cushing in a direct line to win distinction in a medical career.

Dr. Harvey Cushing was born in Cleveland, April 8, 1869, the ninth child in his family. His well known brother, Edward F. Cushing, M.D., a pediatrician, died in 1911; his father, Henry K. Cushing, formerly professor of obstetrics and gynecology in Western Reserve University School of Medicine, died in 1910; his grandfather Erastus Cushing died in 1893, and his great grandfather David Cushing Jr., of Massachusetts, died in 1840.

After receiving the bachelor of arts degree at Yale in 1891, where incidentally he also played baseball, Dr. Harvey Cushing

graduated from Harvard Medical School in 1895, receiving the degrees of master of arts and doctor of medicine. He entered the Massachusetts General Hospital as surgical intern, working with Dr. J. C. Warren. In 1896 he went to Baltimore as junior assistant in the surgical service of Halsted, becoming resident surgeon in 1897 and developing as instructor in surgery, assistant in surgery and associate in surgery. He made the first roentgenograms that were made at Johns Hopkins Hospital and did experimental studies on gallstones, the bacteriology of the alimentary canal, and cocaine anesthesia. In 1900 he studied abroad, traveling with Drs. William Osler and Thomas McCrae. On this trip Dr. Cushing studied in England, France and for a year in Kronecker's laboratory in Berne. Here he carried out some investigations suggested by Kocher on the physiologic relationships of intracranial tension. This work he continued in the laboratory of Mosso in Turin, Italy, and then for four months he worked with Sherrington in Liverpool studying the motor cortex in anthropoids. Late in 1901 he returned to Baltimore and asked for the post of neurosurgeon in the clinic. Here he remained until 1912,

during which time he became associate professor of surgery. He gave the Mutter lecture in Philadelphia in 1901. He became a member of the American Neurological Association in 1903 and president in 1923, a charter member of the American Society of Clinical Surgery in 1903 and president in 1921, a member of the American Physiological Society in 1905, a fellow of the American Surgical Association in 1906 and president in 1927. Dr. Cushing was secretary of the Section on Surgery and Anatomy of the American Medical Association in 1906-1907. He gave the Carpenter lecture in New York in 1906 and the W. M. Banks Memorial lecture in Liverpool in 1909 and the Harvey lecture in New York in 1910. During this period he developed his marvelous technic in neurosurgery. The earlier operations were failures, but Dr. Cushing's courage, precise technic and remarkable spirit began to yield success and his fame spread widely. During this period he developed and described the subtemporal decompressive operation and perfected hemostasis in operations on the brain and new technics for suture. His contributions to the physiology of the brain, the spinal fluid and the pituitary body were fundamental.

In 1912 Dr. Cushing became Moseley Professor of Surgery at Harvard and Surgeon-in-Chief to the Peter Bent Brigham Hospital. He received the master of arts from Yale in 1913, gave the oration of surgery at the International Congress of

Medicine in London in 1913 and was made a fellow of the Royal College of Surgeons, of the American College of Surgeons of which he became president in 1922 and of the Institute of Hygiene in London. He gave the Weir Mitchell lecture in Philadelphia in 1914 and was elected at that time a foreign member of the Société de neurologie in Paris, of the American Academy of Arts and Sciences and of the Washington Society of Arts and Sciences.

In 1914 came the great war, during which the remarkable service rendered by Harvey Cushing was universally recognized. He served with distinction in the British Expeditionary Force; he became surgical director of the United States Base Hospital No. 5 and was appointed senior consultant of neurologic surgery with the American Expeditionary Forces with the rank of colonel. For these services he received the Distinguished Service Medal of the United States, the Companion of the Bath of England, and Officer of the Legion of Honor of France. His war service is reflected in his recently published "Diary of a War Surgeon." Evidently this service in the war was a terrific

physical stress, for Dr. Cushing returned to Boston in 1919 suffering from peripheral neuritis, which was to handicap him during the remainder of his career. Nevertheless in the years from 1919 on he worked indefatigably. He turned to an interest in the history of medicine and made a complete collection of the writings of Vesalius. At the same time he developed a surgical team for neurologic surgery and himself studied intimately the microscopic anatomy, gross anatomy, pathology and physiology of conditions within the brain. Young surgeons flocked to him from all over the world. Today his pupils have won distinction as neurosurgeons. In 1918 he became fellow of the Royal College of Surgeons of Ireland. He received the degree of doctor of science from Washington University in 1919 and in the same year the honorary doctor of laws from Western Reserve University, doctor of science from Yale and Doctor of Science of Queen's University, Belfast. In 1920 he received the degree of honorary doctor of laws from Cambridge and in 1921 was made honorary fellow of the Medical Society of London, giving the chief oration in 1927. In 1921 he became a corresponding member of the Medical Society of Vienna and

in 1922 a Charles Mickle Fellow of the University of Toronto, also the Cavendish Lecturer (London) and was awarded the title of Honorary Perpetual Student of St. Bartholomew's Hospital, London. He also became a corresponding member of the Medico-Chirurgical Society of Edinburgh.

After the death of Sir William Osler, Lady Osler turned over all her data relative to her distinguished husband to Harvey Cushing and he took up the task of preparing the famous biography. This book appeared in 1925 in two large volumes and was awarded the Pulitzer Prize as the best biographic writing of the year.

In the meantime he continued his surgical operations and received additional honors. In 1923 he became a foreign member of the Académie de médecine of Paris and a fellow of the Association of Surgeons of Great Britain and Ireland. In 1924 he gave the Cameron Prize Lecture at Edinburgh and was elected a corresponding member of the Società medico-chirurgica di Bologna. In 1926 he received the honorary doctor of laws from the University of Glasgow, in 1928 the doctor of laws from Jefferson Medical College and the Doctor of Medicine from John Casimir University of Lwow, Poland. In the following year he was made honorary fellow of the Royal Society of Medicine of England, of the Royal Academy of Medicine of Ireland, master of surgery of Trinity College, London, doctor of laws



HARVEY CUSHING, M.D., 1869-1939

of the University of Edinburgh and a fellow of the Royal College of Surgeons of Edinburgh. In 1929 there was published in his honor a special number of the *Archives of Surgery*, dedicated to his sixtieth birthday. A similar festschrift was later published by *Acta medica Scandinavica*. In 1932 Dr. Cushing retired from his posts in Boston and became Sterling professor in the School of Medicine of Yale University, teaching neurology and the history of medicine and holding this position until 1937, when he became emeritus professor.

In addition to the famous "Life of Sir William Osler," Dr. Cushing published "The Pituitary Body and Its Disorders" in 1912, "Tumors of the Nervous Acusticus" in 1917, with Dr. Percival Bailey "A Classification of the Gliomata" in 1925, collected essays under the title "Consecratio Medici" in 1928, "Intracranial Tumors" in 1932, and in the same year a book on "The Pituitary Body and the Hypothalamus."

In July 1938 Oxford University conferred on him the honorary degree of doctor of science, on which occasion great physicians and surgeons from all over the world assembled to honor him. It was pointed out that his former pupils hold positions in Brussels, Louvain, Amsterdam, Manchester, Edinburgh, Leeds, London, Oxford and Newcastle-on-Tyne as well as in most of the leading clinics in the United States. There are honorary Cushing clubs in many medical schools dedicated to his work and his memory.

Since 1931 great universities have continued to honor him. He gave other lectures, such as the Donald Balfour Lecture of the University of Toronto. In 1933 he was honored in Paris, at which time he was presented with the original copy of Clemenceau's thesis for the doctorate in medicine, written in 1865. He received also the honorary degree of doctor of laws from Northwestern University and the honorary degree of doctor of medicine from Budapest.

Of recent years Dr. Cushing had shown special interest in maintaining the traditional professional status of the physician and surgeon and he had given freely of his time and of his efforts in this endeavor. An essay called "Medicine at the Crossroads," published in *THE JOURNAL*, May 20, 1933, page 1567, defined his point of view. In this essay he wrote: "Those who deal with the science of society deal with something that actually does pulsate with so short a time cycle that conditions almost from year to year are never quite the same, so that our theories of today are likely to need modifying tomorrow. What this puzzled world needs perhaps is more study of the past, fewer commissions and surveys of the present, and a greater number of philosophically minded, self-supporting and law-abiding persons who can see all round their particular problem and independently devote themselves to it as do most doctors."

In the presence of such a record and such a career, in the light of such a character and such a man, superlatives fail. Great epochs in medicine are marked by the names of physicians whose careers have made these epochs. With Dr. Harvey Cushing, surgery of the brain became for the first time scientifically established. Of him it may be truly said that he was in all that he attempted greatest of the great.

Andrew Stewart Lobingier, Los Angeles; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; member and past president of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; formerly on the staffs of the Hospital of the Good Samaritan and the Hollywood Clara Barton Memorial Hospital; at one time lecturer in surgery at the University of Southern California School of Medicine; professor of bacteriology and pathology, Gross Medical College, Denver, 1889-1892; professor of pathology, University of Colorado School of Medicine, Denver, 1892-1894, and professor of surgery, 1894-1902; formerly secretary of the Colorado State Medical Society; aged 76; died, July 31, of arteriosclerosis.

Herbert Peter Howell Galloway, Winnipeg, Man., Canada; Victoria University Medical Department, Coburg, Ont., Canada, 1887; formerly associate professor of clinical surgery (orthopedic), University of Manitoba Faculty of Medicine; served during the World War; served as president of the Manitoba Medical Association and the Winnipeg Medical Society; member of the Clinical Orthopedic Society and the American Academy of Orthopedic Surgery; past president and vice president of the American Orthopedic Association; fellow of the American College of Surgeons; aged 73; was the original orthopedic surgeon at the Children's Hospital; on the staff of the Winnipeg General Hospital, where he died, July 13, of cerebral hemorrhage.

George Samuel Bel • New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1893; professor of medicine at the Louisiana State University Medical

Center; assistant in medicine, 1894-1900, instructor in medicine, 1900-1904, assistant professor of medicine, 1904-1910, professor of clinical medicine, 1910-1918, professor and head of the department of medicine, 1918-1924, and emeritus professor of medicine at his alma mater; president of the Louisiana State Board of Medical Examiners; past president of the Louisiana State Medical Society; director of the Charity Hospital; aged 67; died, August 10, of coronary thrombosis.

Lena Kellogg Sadler • Chicago; American Medical Missionary College, Chicago, 1906; fellow of the American College of Surgeons; past president of the Medical Women's National Association and the Chicago Council of Medical Women; attending gynecologist to the Columbus Hospital; attending surgeon to the Women and Children's Hospital; author of "How to Feed the Baby" published in 1925, author with Dr. W. S. Sadler "The Mother and Her Child" published in 1916 and "Psychiatric Nursing" published in 1937, and other books; aged 64; died, August 8, of carcinoma of the breast.

Milton Arlenden Bridges • New York; Columbia University College of Physicians and Surgeons, New York, 1919; assistant professor of clinical medicine at the New York Post-Graduate Medical School, Columbia University; fellow of the American College of Physicians; served in various capacities on the staff of the Riker's Island Hospital of the Department of Correction; consulting physician to the Sea View Hospital, Staten Island; author of "Dietetics for the Clinician" and "Food and Beverage Analyses"; aged 45; died, August 19, of chorio-epithelioma.

George Hudson McLellan • Lieutenant Colonel, U. S. Army, retired, San Diego, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; was commissioned in the medical corps of the U. S. Army as a first lieutenant in 1909 and retired as a major in 1922 for disability in line of duty; served during the World War; was appointed lieutenant colonel under the special act of June 21, 1930; aged 55; died, July 14, of coronary occlusion and cerebral hemorrhage.

William Louis Clapper, St. Louis; Washington University School of Medicine, St. Louis, 1904; formerly senior instructor in obstetrics, gynecology and abdominal surgery, St. Louis University School of Medicine; on the staff of St. Luke's Hospital; assistant gynecologist and obstetrician to St. Mary's Group of Hospitals; member of the Missouri State Medical Association; fellow of the American College of Surgeons; aged 61; died, August 4, of Parkinson's disease.

Leo Thomas Perrault, New York; Jefferson Medical College of Philadelphia, 1908; associate professor of clinical otolaryngology at the New York Post-Graduate Medical School, Columbia University; member of the Medical Society of the State of New York; on the staffs of St. Luke's Hospital, St. Francis Hospital, Post-Graduate Hospital and Metropolitan Hospital; aged 55; died, August 25, in Mantoloking, N. J., of coronary thrombosis.

Bernhard Friedlaender • Detroit; Baltimore Medical College, 1898; member of the Radiological Society of North America; formerly attending obstetrician and gynecologist at the Women's Hospital, and senior surgeon at the Highland Park (Mich.) Hospital; aged 68; died, August 14, in Rochester, Minn., of thrombosis of the mesenteric vein, gangrene of the intestine and peritonitis.

Clyde I. Allen • Detroit; Johns Hopkins University School of Medicine, Baltimore, 1921; fellow of the American College of Surgeons; member of the American Association for Thoracic Surgery; for many years on the staff of the Henry Ford Hospital; aged 45; died, August 2, of cerebral hemorrhage, arteriosclerosis and hypertension.

Joseph Dixon Purvis • Butler, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; past president of the Butler County Medical Society; on the staff of the Butler County Memorial Hospital; aged 56; died, August 3, in St. Mary's Hospital, Rochester, Minn., of subarachnoid hemorrhage.

Judson Albert Palmer, Arcadia, Wis.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890; member of the State Medical Society of Wisconsin; served during the World War; formerly mayor, bank president and health officer; aged 70; died, July 7, of heart disease.

Carl O. Hertzman, Ashland, Wis.; College of Physicians and Surgeons, Baltimore, 1900; member of the State Medical Society of Wisconsin; city health officer; aged 72; on the staffs of St. Joseph's Hospital and the Ashland General Hospital, where he died, July 25, of chronic nephritis and uremia.

Carroll J. Tucker, San Diego, Calif.; Indiana University School of Medicine, Indianapolis, 1914; served during the World War; aged 52; died, July 18, in the Veterans Administration Facility, West Los Angeles, of carcinoma of the prostate with multiple metastases.

Edwin Jason Brewer, Shabbona, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the Illinois State Medical Society; for many years mayor; aged 64; died, August 6.

Ira Ayer, San Diego, Calif.; Long Island College Hospital, Brooklyn, 1892; veteran of the Spanish-American War; at one time personal physician to the King of Siam; aged 70; died, July 9, in the United States Naval Hospital, of myocarditis.

Truman Osborne Boyd Ⓢ Long Beach, Calif.; University of Louisville (Ky.) Medical Department, 1902; past president of the Idaho State Medical Association; aged 69; on the staff of St. Mary's Hospital, where he died, July 8, of lymphosarcoma.

Edmund Francis Fusco Ⓢ Elizabeth, N. J.; Columbia University College of Physicians and Surgeons, New York, 1934; member of the Medical Society of the State of New York; aged 29; died, July 23, at St. Elizabeth Hospital.

Thomas Francis Gartland Ⓢ White River Junction, Vt.; University of Vermont College of Medicine, Burlington, 1893; aged 70; died, July 7, at the Mary Hitchcock Memorial Hospital, Hanover, N. H., of coronary occlusion.

Philips Josiah Edson Ⓢ Pasadena, Calif.; University of California Medical School, San Francisco, 1924; on the staffs of St. Luke's Hospital and the Huntington Memorial Hospital; aged 42; died, July 6, in San Marino.

Gustave Adolph Fritz, Baltimore; University of Maryland School of Medicine, Baltimore, 1915; member of the Medical and Chirurgical Faculty of Maryland; formerly coroner; aged 48; died, July 9, of heart disease.

John Walter Fitz-Gerald Ⓢ Buffalo; Trinity Medical College, Toronto, Ont., Canada, 1900; aged 67; died, July 12, at his summer home at Wasaga Beach, Ont., of coronary thrombosis.

Edgar August Degenhardt Ⓢ Chicago; Chicago Medical School, 1921; served during the World War; aged 43; died, August 14, at his home in Oak Park, Ill., of coronary thrombosis.

Oliver H. Thompson, Marion, La.; University of Nashville (Tenn.) Medical Department, 1884; formerly bank president and member of the school board; aged 82; died, July 28.

Charles W. Montgomery, Washington, D. C.; National Homeopathic Medical College, Washington, D. C., 1894; aged 71; died, July 11, of cerebral hemorrhage and arteriosclerosis.

Ephraim Gardner Kimball, Washington, D. C.; Columbian University Medical Department, Washington, D. C., 1888; aged 81; died, July 17, of chronic nephritis and pyelitis.

Ira De La Matter, Long Branch, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1911; aged 56; died, August 3, in the Toronto Western Hospital.

Laurence A. Saunders, Los Angeles; Louisville (Ky.) Medical College, 1876; aged 85; died, July 24, of pulmonary tuberculosis.

Colston L. Dine, Minster, Ohio; Medical College of Ohio, Cincinnati, 1886; aged 81; died, August 1, of cerebral arteriosclerosis.

William John Hunter Emery, Porterville, Calif.; Cleveland University of Medicine and Surgery, 1882; aged 78; died, July 31.

Henry Applegate Lacy Ⓢ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 75; died, July 30.

Loyal Low Likien, Smithmill, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1901; aged 69; died, July 2.

Robert H. McLean, Lillington, N. C. (licensed in North Carolina in 1882); aged 86; died, July 14, of myocarditis.

Walter J. Proper, Pleasantville, Pa.; Starling Medical College, Columbus, Ohio, 1883; aged 79; died, July 20.

Robert Herman Dengler, Philadelphia; Jefferson Medical College of Philadelphia, 1887; aged 79; died, July 19.

CORRECTION

Dr. Fisher Not Dead.—Dr. James Coleman Fisher of Jefferson, Ohio, whose death was reported in *THE JOURNAL* September 30, page 1346, is not dead. His death was erroneously reported by the Decatur (Ill.) *Herald-Review*, August 6.

Correspondence

POTASSIUM CHLORIDE IN ALLERGY

To the Editor:—In *THE JOURNAL*, September 2, appeared a communication by Dr. David Louis Engelsher in criticism of my report on potassium chloride in allergy. Since this might give an erroneous impression, both of the toxicity and of the efficacy of potassium chloride, I feel that some clarification is needed.

Dr. Engelsher has made the simple mistake, against which I warned in my article, of administering potassium chloride in the dry form. He says "The patients were given ten 5 grain (0.3 Gm.) tablets of potassium chloride to be taken, when necessary, three times a day after meals with at least one glassful of water." (By this he probably means 5 grains to a dose rather than 50.) In my article I stressed the necessity for administering it in dilute form, e. g., 5 grains dissolved in a glass of water. This does not mean prescribing a 5 grain tablet to be taken with a glass of water. It is apparent that the severe epigastric pain described by Dr. Engelsher is due, as I have already noted, to his method of administration. Unfortunately, many of the drug houses are now marketing potassium chloride in tablet form without clear instructions that the tablet is to be dissolved before being taken. When properly administered, potassium chloride only rarely produces side effects. The most important of these is the occasional aggravation of asthma, which calls for the immediate cessation of this treatment; other rare effects include diarrhea and urinary urgency. I have not advocated the use of potassium chloride in chronic asthma.

Answers to letters sent to a number of leading physicians in this country indicate a wide divergence of opinion with regard to its efficacy in allergy. Many report gratifying results, particularly in hay fever and allergic rhinitis. On the other hand, many have found it so far completely ineffective. My results continue to be good, although I do have failures. The only published report so far is that of A. F. Abt, who obtained excellent results in twenty cases. I hope that an explanation for this sharp discrepancy of opinion will be forthcoming. Potassium is neither a "cure" nor a "cure-all"; it is apparent, however, from my results as well as from the numerous reports which I have received, that it has given appreciable relief to a large number of allergic patients.

BENSON BLOOM, M.D., Tucson, Ariz.

THE DEGREE OF "DOCTOR" IN DENTISTRY

To the Editor:—The need for safeguarding the title of "doctor" in the interest of public protection and professional dignity was clearly pointed out by Dr. Frederick Juchhoff in his communication "The Degree of Doctor," published in *THE JOURNAL* August 26, page 876. I need add little to support the main thesis. Although I fully approve the spirit of the communication, I wish to recommend a modification of the following statement by the author to give it a sense of greater completeness: "The statutes should prohibit the use of the title doctor in connection with any healing art by one who does not have a regular medical training." By addition of the phrase "and dental training" following "medical training," the dental profession will be given the honor of distinction that American dentistry rightly deserves. As an Associate Fellow, I believe that I express the sentiment of other dental members in the Association.

From observations made in my recent study on dentistry and dental education (*Principles Underlying the Social and Professional Background in the Education of Dentists and Teachers of Dentistry*, thesis, New York University, School

of Education, June 7, 1939) it is noted that in 1940 all dental schools in the United States will require a two year preprofessional course and a four year professional course of training for the practice of dentistry and the degree of Doctor of Dental Surgery (D.D.S. or D.M.D.). The years required for the professional training of the dentist are the same in number as those required of the physician. As indicated by Dr. Fishbein, the medical course in the United States covers four years (Fishbein, Morris: *Do You Want to Become a Doctor?* New York, Frederick A. Stokes Company, 1939, p. 37). The two preclinical years of the four year professional course in dentistry include a considerable portion of subject matter that is identical in content with the first two years of the medical course. In addition to this, almost all dental schools are affiliated with universities. Since the publication of Professor Gies's Carnegie study in 1926 the proprietary dental school of the past has disappeared in the United States.

It is true, as shown in my report, that a large percentage of dentists and dental educators favor maintaining dentistry as an autonomous profession, independent of medical education. It is, however, unanimously conceded that dentistry is a specialty of medicine (not of medical practice) and an acknowledged oral health service. Dentistry has attained a place of scientific recognition to the extent that eleven dentists have considered it worth while to pursue their graduate studies leading to the Ph.D. degree in hygiene, chemistry and surgery. It has been my pleasure to take the Ph.D. degree in education, stressing in the thesis the professional and social significance of dental education.

I suggest that in all considerations of the degree of "doctor," dentistry be given its due recognition and the consideration it deserves. After all is said and done, dentistry is an integral part of the medical profession. It therefore behooves those who write in defense of the title "doctor" not to overlook the honorable degree of doctor in dentistry.

ALFRED J. ASGIS, D.D.S., Ph.D., New York.

VULVOVAGINITIS IN PREGNANCY

To the Editor:—"The Significance of Vulvovaginitis in Pregnancy" by Edward G. Waters and Eakle W. Cartwright (*THE JOURNAL*, July 1, p. 30) does not cover the entire subject; certain points deserve elaboration:

1. Many, if not most, researches of recent date have used Sabouraud's or modified Sabouraud's medium directly for isolation of the yeastlike fungi instead of the method employed by these authors. Their technics might explain this low incidence. Surely those interested in this work would appreciate the authority for the technic advocated in this article. Yeastlike fungi were isolated from 32 per cent of gravid women without vulval symptoms by Plass and his co-workers (*Am. J. Obst. & Gynec.* 21:320 [March] 1931), from 23 per cent of all pregnant women by Weinstein and Wickerham (*Yale J. Biol. & Med.* 10:553 [July] 1938) and from 14 to 41 per cent in different economic and hygienic groups by Woodruff and Hesselstine (*Am. J. Obst. & Gynec.* 36:467 [Sept.] 1938).

2. The relationship of p_n readings to the mycosis is not clear, since these yeastlike organisms will grow in vitro over p_n ranges greater than any reported readings of the vagina (Hesselstine, H. C., and Noonan, W. J.: *J. Lab. & Clin. Med.* 21:281 [Dec.] 1935).

3. The reports of Hesselstine, Borts and Plass (*Am. J. Obst. & Gynec.* 27:112 [Jan.] 1934), Bland, Rakoff and Pincus (*Arch. Dermat. & Syph.* 36:760 [Oct.] 1937) and Karnaky all agree that certain strains of monilia are capable of producing in certain patients the clinical entity vaginal moniliasis. These workers fulfilled Koch's postulate. Moreover, there is good evidence that some women may be carriers without having the clinical state develop, while in others moniliasis may

develop when the environment is favorable. Thus, this organism is an opportunist. So, until equally good evidence refuting these observations is forthcoming, these reports would seem to stand.

4. It is assumed that the authors made these vaginal cultures at or near term. Published reports of larger series of oral thrush and vaginal mycosis are in direct disagreement, indicating that with larger series the experimental errors are reduced appreciably. The authors offer no source for the contaminations. It is acknowledged that not all oral thrush is contracted from the mother's genital tract, yet it is well established that this is the most frequent source.

5. Why credit the lochial flow as a fungicidal agent when biopsy studies demonstrate a marked and rapid depletion of the glycogen-like material in the vaginal epithelium immediately after delivery (a state unassociated with vaginal mycosis). Early in studies by other workers it was stated that alkalinity of the lochial flow influenced the course of the mycosis, but now enough available data and confirmatory reports offer, if not establish, a more correct answer, namely a deficiency of nutritive materials. H. CLOSE HESSELTINE, M.D., Chicago.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

APPEARANCE OF THROAT IN INFLUENZA

To the Editor:—My associate, who has been practicing thirty years, claims to be able to diagnose grip, or influenza, by means of a pathognomonic throat sign, namely, the appearance of a sharply demarcated, kidney-shaped area of redness confined to the anterior pillars of the fauces with its convexity facing the last lower molar tooth. I have consulted the literature and other physicians on this subject, together with making my own observations, and am unable to confirm this sign, as such a redness appears apparently in many normal throats, especially in smokers. Also the physician claims to be able to prognosticate the course of the disease by means of the gradual fading of this circumscribed redness. He states also that this sign will appear in contacts before the onset of temperature elevation. The rest of the pharynx is allegedly not injected. Is there anything in the literature confirming or denying this sign?

M.D., New York.

ANSWER.—There is no convincing evidence to substantiate the idea that the sign described is pathognomonic of influenza. Most observers who have had an opportunity to study a large number of cases of influenza at a given time have recorded a diffuse redness of the pharynx, soft palate and faucial pillars. In addition there is observed a distinct swelling of the lymphoid follicles resembling discrete glistening dewdrop nodules on the uvula and soft palate. There is frequently a glazing of mucus over the posterior pharyngeal wall, with an enlargement of lymphoid follicles in this location as well. This general description has been termed characteristic, but to say that it is absolutely diagnostic would be exceeding the facts.

RIGOR MORTIS

To the Editor:—Kindly enlighten me regarding cadaveric rigidity. How soon does it set in? How long does it endure before floccidity occurs? What variations may be expected in warm weather outdoors? What variations may be expected in newborn infants exposed outdoors in warm weather?

M.D., Missouri.

ANSWER.—Ordinarily rigor mortis starts between three and six hours after death and develops first in the musculature of the head, face and jaws. It then extends to the upper extremities, the trunk and the lower extremities in sequence, and the process becomes complete in about two hours. Its disappearance occurs in from twenty-four to seventy-two hours or more and the progress of the disappearance is usually in the same regular sequence.

Rigor mortis is influenced by a number of conditions and in persons dying of convulsions or after excessive muscular exertion the rigidity appears quickly, often within an hour from the time of death. Generally in powerfully muscled persons

rigor develops slowly and is retained for a long time. In those with poorly developed musculature, as infants and emaciated persons, the rigidity appears rapidly and is lost rapidly. Heat accelerates the onset and speeds its dissolution. Cold also hastens the onset but tends to retard disappearance, so that the stiffness may be retained for days or even weeks. In such cases it may be necessary to distinguish rigor mortis from stiffness attributable to freezing of the body or to mummification.

In a newborn infant, rigor would ordinarily develop quickly and disappear rapidly. At times in these cases the rigor is fleeting and may be overlooked.

From these considerations it is evident that the different stages in the process can rarely be used as definite criteria in determining the time of death. However, if rigor is found only in the head, face and jaw muscles and the body is still warm, it is reasonable to estimate the postmortem interval as between three and six hours. If rigor is found in the torso and arms and not in the legs, death probably occurred less than twelve hours prior to its onset.

If the legs are stiff but not the torso and arms, it is probable that the person has been dead two or three days. In a body found stiff and cold no definite opinion can be expressed as to the postmortem interval. In any event, estimation of the time interval must be made with caution.

SPAS AND MINERAL WATERS

To the Editor:—Within the past few weeks I have had inquiries from patients as to the value of the spas of Europe and America. 1. Which are the most important ones? 2. What types of diseases do they seem to benefit? 3. Are the springs of America as beneficial as those of Europe? 4. Are all supervised by competent physicians? 5. Do they have dietary regimens, exercises, massages and the like in connection? 6. Where can I obtain information as to the exact chemical analysis of these waters? 7. About how many people frequent these places and what percentage derive some benefit? 8. Can these salts and waters be imported for use in the home? 9. Where can I get a copy of "Spas and Mineral Waters of Europe?" I do not know the names of the authors or publishers, but it was printed in 1896.

M.D., Minnesota.

ANSWER.—1. Important spas in the United States include Hot Springs, Va.; White Sulphur Springs, W. Va.; Hot Springs, Ark.; French Lick, Ind.; Mount Clemens, Mich.; Excelsior Springs, Mo.; Saratoga Spa, Saratoga Springs, N. Y.; Sharon Springs, N. Y.; Glen Springs, Watkins Glen, N. Y., and a number of others.

In Europe the spas in France include Vichy, Vittel, Aix-les-Bains, Royat and many others. In Germany, Baden-Baden, Wiesbaden, Bad Nauheim, Bad Ems, Carlsbad, Marienbad and Bad Gastein are prominent. In England, Bath, Buxton and Harrogate are important. In each country there are other places where spa therapy can be carried out to good advantage.

2. In general, the use of mineral waters and spa treatment is of some value in chronic disabling conditions, including those affecting the heart and circulation; rheumatic disorders; ailments of the stomach, intestinal tract, gallbladder and liver; nervous conditions; certain disorders of the skin, and some metabolic diseases. It is obvious that not every patient with any of these conditions is a proper subject for spa treatment. The most promising patient is one who does not require bed care, who may be treated as an ambulatory patient and who can take advantage of the many-sided program which is available in a well equipped spa; in fact, the regimen may be more important than the composition of the water.

3. Treatment with mineral waters has the same effect in the United States as in Europe.

4. Competent medical advice is available at practically all spas; the physician referring patients for treatment at a spa should place his patient in the care of one of these physicians, who will outline the program. In most places the spa physician is in private practice. In a few places he is associated with the spa organization.

5. Nearly all places have arrangements for dietary regulation, exercise and massage, the details of which should be outlined completely by the spa physician in charge of the patient's program.

6. "Mineral Waters of the United States and American Spas," by Dr. William Edward Fitch (Philadelphia and New York, Lea & Febiger, 1927), gives the chemical analysis of many mineral waters.

In Europe each country has a publication listing the spas of the country, the nature of their waters and the provisions available for treatment. These may be obtained from their respective travel or publicity bureaus in the large cities such as New York.

7. There are no available statistics regarding the actual number of people taking treatment in the spas of the United States. It is estimated that each year from 40,000 to 50,000

patients take regular treatment at Hot Springs, Ark., and from 12,000 to 15,000 at the Saratoga Spa. These estimates indicate that many people take spa treatment in this country. It is impossible to give the exact percentage of those deriving benefit. Benefit from spa treatment occurs (1) in the specific medical ailment and (2) in the general state of health of the patient. One cannot neglect the psychotherapeutic value of a well organized program of treatment, which, with many patients, goes a long way in building up the morale.

8. Some mineral waters are bottled for home use and can be obtained through the distributing agency of the company handling the waters. The salts of the Carlsbad waters have been imported for years. It must be remembered that the extraction of salts from a mineral water gives a residue which many times cannot be completely dissolved when added to plain water. The artificial duplication of natural mineral waters has not been successful because they practically all contain, in small amounts, a certain number of mineral constituents which are not included in the artificial preparation.

9. There is no recent book in English which gives a general survey of mineral waters and spas. The following references deal particularly with certain phases of this important program:

1. Wallace, A. W.: The Modern Health Resort, *THE JOURNAL*, Aug. 8, 1936, p. 419.
2. Fantus, Bernard: Our Insufficiently Appreciated American Spas and Health Resorts, *THE JOURNAL*, Jan. 1, 1938, p. 40.
3. McClellan, W. S.: The Place of Carbon Dioxide Baths in the Treatment of Diseases of the Circulation, *Internat. Clin.* 1:199 (March) 1937.
4. McClellan, W. S.: The Saratoga Spa: Its Place in the Treatment of Rheumatic Disorders, *Arch. Phys. Therapy* 18:408-473 (Aug.) 1937.
5. Kovacs, Richard: American Spas, *Hygeia* 17:207 (March) 1939.

Mineral waters and spa therapy, important as they are, represent only one method of treatment available to the physician, and use of these facilities should be made in conjunction with other methods of treatment such as drugs, dietary regulation and physical measures. Details regarding the chemical and physical properties of the mineral water, the type of accommodations, the cost of treatments and the medical supervision may be obtained by writing to the administration of any of the spas. "Spas and Mineral Waters of Europe" by H. Weber and F. P. Weber was published in London by Smith, Elder and Company in 1896 and 1898. The book is out of print, and no record has been found of the publishing house as being active today.

OPTI-MED AND OBESITY

To the Editor:—The enclosed abstract and order blank was sent me through the mails from Germany, apparently introducing this new proprietary product called "Opti-Med." Inquiry and a brief search fail to reveal the character of the ingredients. Quite obviously, the reliance on some preparation to hinder or retard intestinal absorption to lose weight would seem hazardous. I should greatly appreciate information concerning the preparation with special reference to the mode of action, dangers and reason—if any—for the inclusion of the ingredients.

M.D., New York.

ANSWER.—Opti-Med has not been considered by the Council on Pharmacy and Chemistry and is apparently another name for the obesity treatment marketed by the firm of Dr. Rudolf Reiss of Berlin, under the name "Adiposettes." The American distributor is H. H. Beisner, New York.

The advertising for Opti-Med tablets which has recently been sent to American physicians directly from Dr. Rudolf Reiss (Chemical Works), Berlin, includes no adequate statement of the composition of the tablets. In lieu of a quantitative declaration of the ingredients in simple terminology the German manufacturer offers the following statement, which is inadequate because no quantities are given and because two of the ingredients are described in terms which apparently are designed to conceal rather than reveal their identity: "Opti-Med contains: Extract. fuc. vesic., extract. frangulae, lecithin, tritetraboryl-bis-propanetriolester, bis-oxyphenylphthalide."

In Martindale's "Extra Pharmacopoeia" (London, The Pharmaceutical Press, 1936) "Adiposettes" are described as follows: "Ext. fuc. vesic. 5.9%, Ext. frangul. 8%, lecithin 1%, tetraboryl-bis-propan-triolester 30%, triphenylcarbinol-o-carbonic acid glycolate 10%."

From the foregoing statements it appears that the anti-fat tablets of Dr. Rudolf Reiss (Chemical Works) contain extract of fucus vesiculosus (bladderwrack), extract of frangula (buckthorn bark), lecithin, a derivative of a boric acid glycerin ester, and a substance which is either phenolphthalein or a closely related product. This combination of purgative drugs together with other agents not infrequently found in anti-fat nostrums is offered to physicians as "a valuable preparation, free from any undesirable by-effects," one "which effectively reduces body weight without harm to your patient." It is also claimed that

"Whilst a suitable diet (and no alcohol), is—as you know—of help, European doctors have reported successful treatments of many cases, *without* changing the mode of living of their patients."

Since the boric acid glycerin ester is stated to be the "specifically acting" constituent that increases the oxidation of fat and decreases the assimilation of food in the intestine, it may be well to recall the following excerpt from Dr. F. Zernik's article, "New Pharmaceuticals in Germany," in the *Manufacturing Chemist* of June 1935:

"Of late the medicinal products industry has devoted increasing attention to slimming preparations. After numerous official warnings or prohibitions had been issued against the dangerous nature of dinitrophenol or its derivatives, interest has been diverted towards boric acid-containing preparations. Popularity was acquired in this connection by compounds of boric acid with urea, as well as sodium compounds of boric acid. A representative of this group is adiposettes (Dr. Rudolf Reiss, Berlin), dragées combining purgatives with seaweed extract and a boric acid glyceryl ester. The German Office of Health has published a warning, pointing out that boric acid and borax, whenever administered in quantities greater than a fraction of a gram, do not belong to those preparations entirely free from undesirable action upon human beings and that, therefore, the consumption of boric acid-containing preparations for slimming purposes without medical supervision may eventually be injurious to the health. Recently the use of boric acid slimming preparations has been completely prohibited in Denmark, probably for the reason stated above."

ATTACKS OF EPIGASTRIC PAIN WITH DEFECATION

To the Editor:—A white woman aged 53 complains of recurrent attacks of epigastric pain of severe intensity. The onset of the attacks occurred approximately two years ago, during which time they have been irregular as to frequency, sometimes not occurring for a period of months and again occurring two or three times in one week. The duration is from two to five hours. The patient's first premonition of an ensuing attack is a feeling of abdominal fullness with a desire to move the bowels. The attack comes on with severe pain; there is no abdominal tenderness and no elevation of temperature; at times there does exist a slight vertigo on arising, and often there is a chill after the pain subsides without any elevation of temperature after the chill. After the attack has passed, the patient feels no ill effects whatever except fatigue and is able to be up and about without any abdominal discomfort or gastrointestinal disturbances. There is no nausea during the attack or after. The bowels are moved two or three times during an attack but afford no relief. Various types of medication have been attempted to relieve the attack without any results. However, whisky on one occasion produced sleep but since that time has been unsuccessful. Morphine, both by mouth and hypodermically, has produced no effect on the patient. The patient gives a history of having had gall-bladder colic five years ago, the nature of these attacks being entirely different from the present ones, and the diagnosis of attacks of gallstone colic was questioned at that time. The patient has developed a fear of future attacks and more or less anticipates them continuously, with a resulting depression and melancholia. The attacks, except in two instances, have occurred just before she retires and on two occasions have awakened the patient from sleep. During an attack, physical manifestations such as elevation of temperature and tenderness are essentially negative. Following a series of attacks the patient guards her diet, not because of qualitative food dyspepsia but because of a fear of another attack, and consequently loses considerable weight. However, if the attacks do not come as she anticipates she increases her diet with no ill effects and gains weight, leaving her in a happy frame of mind. The patient normally suffers from constipation but keeps the bowels open with a mild laxative, and there is definitely no history of constipation preceding an attack. I would be interested in having your opinion as to diagnosis and treatment.

M.D., Pennsylvania.

ANSWER.—At this woman's age one would think first of definite organic disease involving perhaps the small bowel. The fact that these attacks have persisted for two years, during which time the patient hasn't come to any bad end, would tend to rule out a neoplasm or any lesion obstructing the bowel. The tendency to gain in weight is also encouraging. Lesions of the small bowel usually force the patient to operation within six months after the symptoms begin. The desire to move the bowels with attacks suggests something irritating the bowel. Apparently there are no symptoms of intestinal obstruction. The shortness of the attacks and the lack of physical indications suggest more a functional disturbance, such as is seen in rare cases of abdominal migraine. Sometimes at the menopause a typical migraine will change and produce attacks somewhat like those described. The absence of nausea speaks against the presence of migraine or of a lesion in the bowel. The fact that morphine does not work is much in favor of a functional trouble rather than an organic one.

Something like this picture can be seen in nervous persons after emotional debauches. The commonest cause, of course, of severe abdominal pain in a woman of this age would be gallstones. Gallstone attacks, however, should have responded to morphine. Naturally one would want to examine the gall-bladder with x-rays to see whether it is functioning and whether it contains stones. It would be helpful to see whether after an attack the serum bilirubin goes up. The fact that attacks have awakened the patient from sleep indicates organic disease.

A remote possibility is that the patient may be responding allergically to some food; allergy is not so likely to begin at the age of 51. It might be well, however, to have the patient keep a record to see whether attacks follow the eating of any particular food.

It would be helpful in a case such as this to watch a barium sulfate meal as it passes down the small intestine to make sure that there is no obstruction anywhere. One possibility is that the attacks are due to an internal hernia, but in this case the patient would probably have come to grief before now.

In cases such as this it is generally wise not to explore the abdomen unless some definite indication is found for it. It is presumed that the knee jerks are present and that the Wasserman reaction is negative. The attacks do not much suggest a "crisis." Another lesion that has to be ruled out is a small duodenal ulcer with perforation posteriorly. In such cases one can generally obtain a history of ulcer many years before. One might think also of pancreatic stones and perhaps arteriosclerotic changes in the mesenteric blood vessels. Such changes are common but generally silent. One would think of a lesion of the spinal cord, but this probably would have brought serious trouble in the course of two years.

STAINED LIPS FROM SMOKING

To the Editor:—Could you tell me why nicotine stain should collect on my lips while smoking? It is much heavier with cigarettes than with a pipe. The staining is so heavy it produces a dark brown discoloration on handkerchiefs, which wash with great difficulty. I smoked about three packs of cigarettes for a period of five years when one day I noticed on my lips a dark brown stain which would rub off easily. I tried a holder and then filters, without an iota of help. I changed to pipe smoking and the stain is greatly improved. Nevertheless, some still collect. I have absolutely no discomfort—never have cracked or chapped lips. Could you suggest any treatment?

M.D., New York.

ANSWER.—This experience seems unique. None of the smokers of cigarettes, dentists or physicians consulted have noted staining of the lips by cigarettes. Tobacco of any kind will produce a brown juice when chewed. This is not due to nicotine, which is a colorless liquid turning brown only on aging.

As the color rubs off easily one should not be too concerned. Perhaps smearing the lips with petrolatum or a wax pomade would be helpful. Paper handkerchiefs, easily obtained, would avoid the staining of linen.

SULFANILAMIDE FOR TYPHOID CARRIERS

To the Editor:—Kindly send references on the use of sulfanilamide for typhoid carriers. What is the present consensus as to its value in this connection?

M.D., Virginia.

ANSWER.—One reference has been found to the use of sulfanilamide in the control of the typhoid or paratyphoid carrier state. A. T. Bazin (*Canad. M. A. J.* 38:559 [June] 1938) reported that he had been able to eradicate paratyphoid bacilli from the bile of a carrier by intensive therapy with sulfanilamide. It would seem from the literature however that, since sulfanilamide has not been especially effective in the control of clinical typhoid and paratyphoid infections, its use in the carrier state would not be of great value unless one was dealing with urinary tract carriers. For this type of carrier sulfanilamide might be of some value because one can obtain high concentrations of the drug in the urine of treated persons provided adequate quantities of the drug are prescribed.

DILUTIONS FOR TUBERCULIN TESTING

To the Editor:—Each fall my associates and I do 1,500 tuberculin tests using two strengths of purified protein derivative. We could considerably reduce the cost of this procedure if we bought only a stronger dilution and made up the weaker dilutions ourselves. Will you please send us directions for making up the proper diluting fluid.

Edgar S. Krug, M.D., State College, Pa.

ANSWER.—Since the second dose is 250 times the strength of the first, the simplest way to achieve the desired first dose from a second strength tablet would be to dissolve a second strength tablet in 250 cc. instead of 1 cc. of the buffer solution. This would yield a solution containing 2,500 doses. Since this is probably greatly in excess of what would be used within the keeping limits of the diluted solution, a smaller quantity would be preferable. This can be prepared by making dilution in two stages: e. g., dissolve one second strength tablet in 1 cc. of buffer solution, withdraw exactly 0.1 cc. with a sterile calibrated syringe and add it to 24.9 cc. of sterile buffer, or salt, solution. Each 0.1 cc. of the resulting 25 cc. will furnish the required first dose.

Medical Examinations and Licensure

COMING EXAMINATIONS
STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Basic Science. Tucson, Dec. 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson.

ARKANSAS: Basic Science. Little Rock, Oct. 23. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. Medical (Regular). Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison. Medical (Eclectic). Little Rock, Nov. 9-10. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: If written examination. Sacramento, Oct. 16-19. Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 430 State Office Bldg., Sacramento.

CONNECTICUT: Basic Science. New Haven, Oct. 14. Prerequisite to license examination. Address State Board of Healing Arts, 1895 Yale Station, New Haven. Medical (Regular). Examination. Hartford, Nov. 14-15. Endorsement. Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. Medical (Homoeopathic). Derby, Nov. 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Examination. Dover, July 9-11. Reciprocity. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: Basic Science. Washington, Oct. 23-24. Medical. Washington, Nov. 13-14. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

ILLINOIS: Chicago, Oct. 17-19. Acting Superintendent of Registration, Department of Registration and Education, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Regular. Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homoeopathic. Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MINNESOTA: Minneapolis, Oct. 17-19. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Reciprocity. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 26-28. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: Lincoln, Nov. 24-25. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: If written examination and reciprocity with oral examination. Carson City, Nov. 6. Sec., Dr. John E. Worden, 311 W. Robinson St., Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. Earl S. Itallinger, 28 W. State St., Trenton.

NORTH CAROLINA: Reciprocity and Endorsement. Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 5-7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Basic Science. Oklahoma City, Nov. 6. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. Medical. Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: Basic Science. Portland, Oct. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: Austin, Nov. 20-22. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Fairmont, Nov. 6-8. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: Basic Science. Milwaukee, Dec. 2. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. Medical. Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Delaware July Report

Dr. Joseph S. McDaniel, secretary, Medical Council of Delaware, reports the written examination held at Dover, July 11-13, 1939. The examination covered ten subjects and included 100 questions. Seventy-five per cent in each subject was required to pass. Thirteen candidates were examined, eleven of whom passed and two failed. Three physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine.....	(1938)		85
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1937)		80

School	FAILED	Year Grad.	Per Cent
Hahnemann Medical College and Hospital of Philadelphia.....	(1937) 77,	(1938)	78
Jefferson Medical College of Philadelphia.....	(1937) 78, 81,	(1938)	80, 81
Temple University School of Medicine.....	(1938)		79
University of Pennsylvania School of Medicine.....	(1937)		82, 83
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine....	(1933)		Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1924)		Maryland
New York Homoeopathic Medical College and Flower Hospital.....	(1916)		New York

Arizona July Report

Dr. J. H. Patterson, secretary, Arizona State Board of Medical Examiners, reports the written examination held at Phoenix, July 5-6, 1939. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Five physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of California Medical School.....	(1937)		81.5
Louisiana State University Medical Center.....	(1938)		84.3
Baylor University College of Medicine.....	(1938)		83.7
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine.....	(1936)		Iowa
St. Louis University School of Medicine.....	(1936)		Missouri
Jefferson Medical College of Philadelphia.....	(1932)		Penna.
Vanderbilt University School of Medicine.....	(1927)		Tennessee
McGill University Faculty of Medicine.....	(1924)		California
School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Duke University School of Medicine.....	(1934)		N. B. M. Ex.

Georgia June Examination

Mr. R. C. Coleman, joint-secretary, State Examining Boards, reports the written examination held by the State Board of Medical Examiners at Atlanta and Augusta, June 7-8, 1939. The examination covered ten subjects and included 100 questions. An average of 80 per cent was required to pass. Seventy-eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939)		82.5, 87.8
Emory University School of Medicine.....	(1938)		83.2, 88.2,
	(1939) 82, 83.5, 84.6, 84.8, 84.8, 84.9, 84.9, 84.9,		85.1, 85.2, 85.2, 85.3, 85.8, 85.9, 85.9, 86, 86.2, 86.2,
	86.4, 86.5, 86.6, 87.4, 87.9, 88, 88.1, 88.1, 88.5, 88.7,		88.8, 88.8, 89.5, 90, 90.4, 90.6, 90.7, 94.6
University of Georgia School of Medicine.....	(1939)		80.9,
	81.1, 81.5, 81.8, 82, 83.1, 83.4, 83.8, 83.9, 84, 84.2,		84.7, 84.8, 85, 85.5, 85.2, 85.2, 85.3, 85.3, 85.7, 86,
	86.1, 86.1, 86.3, 86.5, 86.9, 87.7, 87.8, 91.2		
Harvard Medical School.....	(1935)		85, 85.3
Columbia University College of Physicians and Surgeons.....	(1939)		90.3
Cornell University Medical College.....	(1937)		84.3
New York Medical College and Flower Hospital.....	(1937)		88.4
University of Oregon Medical School.....	(1937)		85.4
Deutsche Universität Medizinische Fakultät, Prag.....	(1911)		84.2

Twenty physicians were licensed by reciprocity and two physicians were licensed by endorsement from January 5 through July 6. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....	(1927)		Missouri
University of Illinois College of.....			California
University of Louisville School of.....			Kentucky
Tulane University of Louisiana.....	(1935)		
Alabama.....	(1935), (1937)		Louisiana
University of Michigan Medical School.....	(1936)		Minnesota
New York University College of Medicine.....	(1935)		New York
Jefferson Medical College of P.....			S. Carolina
Medical College of the State of.....			S. Carolina
University of Tennessee Col.....	(1936), (1937, 2)		Tennessee
Vanderbilt University School of Medicine.....	(1900)		Utah,
	(1935), (1936) Tennessee		
University of Wisconsin Medical School.....	(1933)		Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Western Reserve University School of Medicine.....	(1935)		N. B. M. Ex.
Vanderbilt University School of Medicine.....	(1934)		N. B. M. Ex.

Book Notices

The Structure and Composition of Foods. By Andrew L. Winton, Ph.D., and Kate Barber Winton, Ph.D. Volume IV: Sugar, Syrup, Honey, Tea, Coffee, Cocoa, Spices, Extracts, Yeast, Baking Powder. Cloth. Price, \$9. Pp. 580, with 134 illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Limited, 1939.

The present book completes this notable series of four volumes on foods. It includes four parts, or sections, on sugar, syrup and other saccharine products, on so-called alkaloidal products, on spices and extracts and other flavoring materials, and on leavening agents such as yeast and baking powders. There is also a chapter of addenda to volumes II and III of the series. It is in the sections on food adjuncts particularly that the value of the authors' method of presentation is apparent. There is presented not only the usual description of chemical composition but also a discussion of each subject from the botanic point of view, illustrated by numerous excellent drawings of cell structures. Many of the spices can be better identified by determination of the morphologic characteristics of material under examination than by chemical analysis. Although the botanic method of description and classification has been emphasized, the chemical presentation has not been neglected. The book is suitably indexed. It is the kind of book one may turn to with confidence to find information on inquiries such as: What is the composition of maple syrup from different parts of the country? What is caramel? What enzymes have been found in honey? What products have been found in coffee, tea and cocoa? What is the nature of oil of peppermint? What alkaloids have been found in pepper? What is the difference between paprika and pimiento? What are the constituents of bakers' yeast? How are baking powders classified? This volume is a fitting conclusion to the encyclopedic series. The set comprises a veritable mine of information about the structure and composition of foods and food adjuncts, written by experts who have had a lifetime of experience in the field.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie. Par MM. F. Baillart, Ch. Coutela, E. Redslob, E. Vetter. René Onfray: Secrétaire général. Tome I: Histoire, embryologie, anatomie. Par MM. L. Cerise et al. Cloth. Pp. 1,042, with illustrations. Paris: Masson & Cie, 1939.

This is the first of an eight volume treatise on ophthalmology sponsored by the French Society of Ophthalmology with completion promised in less than a year. There are 103 collaborators from France, Belgium and Switzerland. A general table of the entire material to be covered is in the beginning of the first volume and an alphabetical index of all the volumes is promised for the end of the eighth volume. At the end of each chapter is a moderate sized but comprehensive bibliography embracing the modern literature in all languages. A rather interesting and useful novelty is the printing on each page of just where the bibliography pertaining to the subject matter of that page is to be found.

The three fairly modern compilations of ophthalmology are the Graefe-Saemisch Handbuch (which has taken forty years for completion), the Kurzes Handbuch der Ophthalmologie and the American Encyclopedia of Ophthalmology. The new French traité does not follow the pattern set by any of these but branches out boldly on a new path of its own. That path conforms to the advances of the recent decades, even though each collaborator has been allowed full sway to handle his subject matter as he has seen fit. If the clinical parts of the traité maintain the standards set by the first volume, the ophthalmologic world will have something new and valuable.

The first volume opens with an elaborate table of contents preceded by the names, titles and locations of the collaborators. Then comes a short and somewhat inadequate history of ophthalmology by Villard of Montpellier. The general development of the visual apparatus was written by Leplat of Liège, is well done, and has some original illustrations of embryos from the collection of the University of Liège. This is followed by a chapter on the embryology of the different parts of the ocular apparatus by Dejean of Montpellier. Although not lengthy, the material is well presented and well illustrated. A short chapter on comparative embryology and phylogenesis of the

visual apparatus by the same author follows. Then comes a long and detailed description of the anatomy and histology of the orbit and the ocular adnexa by Winckler of Strasbourg. This is well illustrated with many photographs of original dissections and diagrams of intra-orbital contents. This chapter is particularly good, for it contains much material that cannot be found elsewhere. The anatomy and histology of the lacrimal system and of the vascular system of the ocular apparatus was written by Jayle of Marsilles. The crowning section of the volume, however, is the chapter on the anatomy and histology of the eyeball by Redslob of Strasbourg. Every ophthalmologist, no matter how experienced, can read that with profit. Then follow the shorter chapters on the anatomy of the optic pathways by Lhermitte of Paris, the anatomy of the oculomotor nervous system by Van Gehuchten of Louvain, the anatomic pathways for ocular sensibility by Cerise and Thurel of Paris, the anatomy of the sympathetic and parasympathetic nervous system of the ocular apparatus by Tournay of Paris and comparative anatomy and physiology by Rochon-Duvigneaud of Paris. The last two and somewhat longer chapters on heredity and teratology are by Van Duyse of Ghent.

In a review of this character it is of course impossible even to try to evaluate each individual chapter. Suffice it to say that a high standard of excellence is maintained throughout the volume, which occupies a somewhat unique place in ophthalmic literature. The volume is printed on rather thin paper, according to our standards, and the type is somewhat fainter and smaller than we are accustomed to use. The illustrations are uniformly excellent, the majority being in black and white. However, the few colored illustrations give great promise for the volume that will cover diseases of the fundus. In producing this eight volume work the French Society of Ophthalmology is making a distinct contribution to modern ophthalmology. For all libraries and readers of French, this encyclopedia is a necessity.

You're the Doctor. By Victor Helser, M.D. Cloth. Price, \$2.50. Pp. 300. New York: W. W. Norton & Company, Inc., 1939.

This is a rambling, somewhat discursive, book on health which discusses many phases of the subject, few of them adequately and many of them superficially. Readers of *An American Doctor's Odyssey* will be disappointed. The book contains some interesting anecdotes based on the author's worldwide experience and travels but it lacks the vivid and interesting qualities of his odyssey.

On page 84 his first paragraph on vitamin C mentions the most concentrated source as paprika, but paprika cannot be used in significant amounts to make a real contribution of vitamin C to the diet, as can oranges, lemons, grapefruit, tomatoes and raw cabbage; he mentions only tomatoes specifically and singles out no fruits or vegetables as exceptionally good sources of vitamin C, except boiled potatoes.

On page 201, in a brief paragraph on hernia, he says "Operative cure is usually simple and recently, under certain conditions, some have been effected medically without aid of the surgeon by injecting irritating substances." This is misleading; the safety of injection methods depends on the careful selection of cases and the technic of a well qualified surgeon.

On page 250 he credits the supervision of small private hospitals to municipal health departments and makes no mention of the American Medical Association Council on Medical Education and Hospitals, the American College of Surgeons or the American Hospital Association; all these have contributed infinitely more to improvement of hospital standards in the United States than has any health department, except so far as a few of the larger municipalities may operate their own hospitals. Even these have been known to be unacceptable to professional agencies adhering to high standards.

On page 253 he says that outbreaks of measles can be suppressed quickly by injecting serum. Health officials seem to have overlooked the availability of a quick means of suppressing measles epidemics; the truth is, of course, that mortality has been curtailed by the use of convalescent serum but never has there been available an adequate supply of this preparation and never has any considerable epidemic been suppressed by this technic.

On page 261, after recounting how he procured the cooperation of many agencies in a proposed new health program for

Halifax, he says "Only after an hour and a half conference did the Halifax Medical Association agree." With reference to no other agency does the author use this implication of reluctance when, as a matter of fact, an hour and a half seems hardly a long conference if it results in the enlistment of cooperation for an entirely new health program for an important seaport like Halifax.

These statements are chosen at random in support of the reviewer's opinion that the book is poorly organized and unbalanced. It is of course an assemblage of essays written from time to time for a variety of publications.

A Cerebral Atlas Illustrating the Differences Between the Brains of Mentally Defective and Normal Individuals with a Social, Mental, and Neurological Record of 120 Defectives During Life. By Richard J. A. Berry, M.D., F.R.S.E., F.R.C.S.E., Director of Medical Services to the Incorporation of National Institutions for Persons Requiring Care and Control, Stoke Park Colony, Bristol. Cloth. Price, \$35. Pp. 425, with 441 illustrations. New York, Toronto & London: Oxford University Press, 1938.

The study conducted by Dr. Berry and his associates has consisted of the correlation of clinical observations with physiologic and anatomic evidence. He has compared the brains of idiots, imbeciles, moral defectives and feeble-minded persons with those of normal persons. He has compared them as to actual size by the brain product method, he has compared them as to weights of the right cerebral hemisphere and he has compared the planimeter cortical areas as determined on the flat by dioptrographic tracings. He has also compared as to morphologic changes grossly and microscopically the brains of feeble-minded persons with those of normal persons.

In determining the actual size of the brain by the brain product method, he multiplied the length by the breadth and the height of the brain by dioptrographic tracings and for practical purposes used the same measurements on the head and assumed that the proportion of brain size is about 66 per cent; that is, the brain is about two thirds the size of the head. In estimating the weight of the brain, the right cerebral hemisphere alone of both normal and defective persons is stripped, mounted in formaldehyde-saline solution and weighed after the removal of all superfluous fluid either inside or outside the brain. Surface areas of the brains of normal and feeble-minded persons were calculated by dioptrographic tracings. Comparisons of respective areas in normal and diseased brains were made to bring out the morphologic differences.

Dr. Berry's atlas is of incalculable value, since each series of photographs is accompanied by a thorough history and neurologic examination in the case prior to death of the patient, as well as computations as to the actual size of the brain product and the weight of the right cerebral hemisphere and cortical areas. The photographs in every instance illustrate the gross morphologic changes.

In summary the author states that, during its growth from birth to adult, the average brain increases in weight by roughly 1,000 Gm. According to Donaldson, it does so by an increase of its non-nervous constituents and by an enlargement of its nerve elements:

These latter changes are dependent on the increase in the mass of the cell body and cell outgrowth, especially the axons, and in the acquisition of the medullary sheath. Calculation shows that the absolute mass of the medullary substance is the chief source of increase in weight during this period. The weight increase in the nerve element proper is due to the enlargement of those cells which at birth are small, the addition of nerve cells being excluded since their formation ceased at birth.

The author further states that if, therefore, a defective brain is found to weigh less than a comparable normal brain—the two having been weighed under strictly similar conditions—to be appreciably smaller and to possess a corpus callosum (through which all medullated neopallial commissural axons must pass) smaller than normal, it is a reasonable inference that the brain is deficient in its number of fully developed and properly functioning cortical neurons and hence is incapable of achieving that type of mental reaction which distinguishes man from the animals. On the whole, the brains of idiots are 10 per cent smaller than the brains of normal persons:

The chief differences between defective brains and a normal one of the type described may be summarized briefly as follows. In a defective brain there is:

1. A considerable reduction in size and weight.
2. A tendency for the persistence in the convoluted pattern of certain prenatal development features.

3. A greater variation than occurs normally in the gyri and sulci bordering the central sulcus of Rolando—that is, in the important effector and receptor areas.

4. A lack of full development in the opercula, particularly in the frontal one, which frequently fails to cover the insula.

5. A diminution in the cortical amount of the triangular parietal area—that is, of the area concerned with the association of incoming impulses from the somesthetic, acoustic and visual areas.

6. On the medial surface the corpus callosum appears to be frequently diminished in size, notably the genu and splenium.

7. The visual areas exhibit more variation in pattern and extent.

8. Lastly, the sulci generally appear to be shallower in the defective brain than in the normal.

Hammberg, in his classic studies of normal and idiot brains, long ago pointed out that even comparatively small diminutions in the development of the cortical cells were sufficient to reduce the intelligence to moderate imbecility. Any of the variations just described as of frequent occurrence in the defective brain have a precisely similar effect.

The reviewing of this work has been exceedingly interesting and instructive. The author has presented comparisons of defective brains with those of the normal brain as no other author has done. The presentation of the clinical symptoms due to morphologic changes in the brain elucidates the problem of the mentally defective. The atlas not only is of value to the anatomist and physiologist but should be an excellent reference work for every neurologist and psychiatrist.

Alcoholics Anonymous: The Story of How More Than One Hundred Men Have Recovered from Alcoholism. Cloth. Price, \$3.50. Pp. 400. New York: Works Publishing Company, 1939.

The seriousness of the psychiatric and social problem represented by addiction to alcohol is generally underestimated by those not intimately familiar with the tragedies in the families of victims or the resistance addicts offer to any effective treatment. Many psychiatrists regard addiction to alcohol as having a more pessimistic prognosis than schizophrenia. For many years the public was beguiled into believing that short courses of enforced abstinence and catharsis in "institutes" and "rest homes" would do the trick, and now that the failure of such temporizing has become common knowledge, a considerable number of other forms of quack treatment have sprung up. The book under review is a curious combination of organizing propaganda and religious exhortation. It is in no sense a scientific book, although it is introduced by a letter from a physician who claims to know some of the anonymous contributors who have been "cured" of addiction to alcohol and have joined together in an organization which would save other addicts by a kind of religious conversion. The book contains instructions as to how to intrigue the alcoholic addict into the acceptance of divine guidance in place of alcohol in terms strongly reminiscent of Dale Carnegie and the adherents of the Buchman ("Oxford") movement. The one valid thing in the book is the recognition of the seriousness of addiction to alcohol. Other than this, the book has no scientific merit or interest.

Milk Supplies and Their Control in American Urban Communities of Over 1,000 Population in 1936. By A. W. Fuchs, Senior Sanitary Engineer, and L. C. Frank, Senior Sanitary Engineer. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General. U. S. Treasury Department, Public Health Service. Public Health Bulletin No. 245. Paper. Price, 10 cents. Pp. 70. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This pamphlet provides the results of a study conducted by the U. S. Public Health Service on the production and consumption of fluid market milk, the volume and price of various grades of milk sold, the legal requirements and the extent of both pasteurization of milk and of the testing of milk cows for tuberculosis or infectious abortion, state and local milk control organization and personnel, and the inspection, sampling and bacterial quality of local milk supplies. The information which forms the basis of the report was secured by means of the questionnaire method and by correspondence, and there was made available information from more than 2,500 municipalities. It was found that nearly 75 per cent of the market milk in the municipalities studied was pasteurized and that 99.4 per cent was from tuberculin tested herds. It is pointed out that since 1923 there have been phenomenal progress in abortion testing in cattle, extensive progress in tuberculin testing and considerable progress in pasteurization. It is interesting to note from this survey that the daily per capita consumption for the entire country is estimated to be 0.66 pint of fluid market milk, 0.035 pint of cream and 0.031 pint of buttermilk, or a total of 0.73

pint. The total milk consumption was lowest in the Southern states and highest in New England. It is estimated that 36 per cent of the municipalities had a milk ordinance. Control of milk sanitation work was a function of the health department in twenty-two states, of the department of agriculture in twelve, jointly of health and agricultural departments in ten, and of some other agency in four. Some degree of local milk control was exercised in about one third of all municipalities. Milk supplies for the larger cities apparently are subjected to greater control than those of smaller municipalities. The information provided by this pamphlet should be valuable to all who are interested in statistics on the sanitation and consumption of fluid milk.

Electrocardiographie expérimentale: Application à la physio-pathologie du cœur, dualité du cœur, arythmies. Par le Docteur E. de Somer, professeur de pathologie générale à l'Université de Gand. Préface du Prof. Dr. Wennebaech. Paper. Pp. 142, with 122 illustrations. Paris: Masson & Cie, 1938.

In this brochure the author presents data on which he attempts to outline his ideas regarding the genesis of the electrocardiogram. There is little reference to the literature, the presentation is polemic, the views expressed are unorthodox, the evidence is unconvincing and the method of recording the electrocardiogram is unconventional. The spacing of the booklet into three separate parts containing respectively the text, the illustrations and the legends makes it extremely difficult to follow the abstruse presentation. Apparently the author is convinced of the dualistic theory of the origin of the heart beat, namely that there is one pacemaker for the auricles and another for the ventricles. This view has cropped up before and will probably appear again, but it has few advocates, and none apparently among the leading students of this subject.

Annual Review of Biochemistry. James Murray Luck, Editor. James H. C. Smith, Associate Editor. Volume VIII. Cloth. Price, \$5. Pp. 676. Stanford University P. O., California: Annual Reviews, Inc., 1939.

The eighth volume of these now indispensable reviews of annual advances in biochemistry is the first since the establishment of the companion volume known as the Annual Review of Physiology. It is the conviction of the editorial board that the publication of two sets of reviews will considerably ease the trials of the authors. To the present commentator it seems to be a mistake to separate two closely allied subjects such as biochemistry and physiology, and one criticism of the articles in the present volume is that the physiologic aspects are too often omitted. Perhaps this is necessary, but it is unfortunate to establish any line of demarcation when none exists. The difficulties presented to the reader because of emphasis on chemistry may be exemplified perhaps by the following sentence, which appears in an authoritative review of the alkaloids: "The alkaline retronectine, the basic fragment from the hydrolysis of senecionine, retrosine, jacobine, squalidine, trichodesmine and seneciophylline, is converted by hydrogenation to retronectanol, $C_{15}H_{25}NO$."

The subjects in the present volume include biologic oxidations and reductions, proteolytic enzymes, nonproteolytic enzymes, polysaccharides and lignin, x-ray studies of the structure of compounds of biologic interest, the chemistry of the acyclic constituents of natural fats and oils, the chemistry of proteins and amino acids, the chemistry and metabolism of the compounds of sulfur, carbohydrate metabolism, lipid metabolism, metabolism of proteins and amino acids, mineral metabolism (calcium, magnesium and phosphorus), hormones, choline as a dietary factor, the water-soluble vitamins, the fat-soluble vitamins, metabolism of brain and nerve, the alkaloids, chemical aspects of photosynthesis, mineral nutrition of plants, growth hormones in the higher plants, animal poisons, ruminant nutrition, immunochemistry and the biochemistry of yeast. There is an author index and a subject index.

It is apparent from the list that some topics are so broad that much more space should be provided for their appropriate presentation. There is still too much mere cataloguing of papers without discussion or even mention of the results obtained. Thus in a discussion of molecular weight determinations of proteins there appears the sentence "Sumner, Galen and Eriksson-Quensel (1, 2, 3) studied the crystalline proteins, urease, canavalin, concanavalin A, and concanavalin B, from

the jack bean." The only way the reader can find out what values were found is to refer to the papers cited as numbers 1, 2 and 3. There is almost a page devoted to the discussion of molecular weight determination of proteins, and, although some values are recorded, it would be much more satisfactory to the reader if all the values were listed in a table. There are excellent tables of coenzyme specificity of dehydrogenases and tables of utilization of amino acid derivatives for growth.

Ernährungslehre: Grundlagen und Anwendung. Bearbeitet von B. Bleyer et al. Herausgegeben von Professor Dr. Wilhelm Stepp, Direktor der 1. Medizinischen Klinik der Universität München. Cloth. Price, 36 marks. Pp. 622, with 34 illustrations. Berlin: Julius Springer, 1939.

This is a modern textbook on nutrition written in German by seventeen contributors in addition to the editor. It is interesting to note the many references to American work as compared with the relatively few citations in some of the standard German textbooks of twenty or thirty years ago. In the discussion of energy requirements the work of F. G. Benedict, Du Bois and Boothby and their collaborators is discussed at length. The recent work of W. C. Rose, Brand, Lewis, du Vigneaud and others on the nutritional significance of the amino acids, including the recent work on the homologues of cystine, is presented. The expression "protective food" has been introduced into the German language as "schutzzstoffe." Discussion of some subjects, such as mineral metabolism, is brief, as is necessary perhaps because of the nature of the book. The chemistry of the vitamins is presented fully but briefly. Each chapter contains a selected bibliography. The references presented in the discussion of nicotinic acid and pellagra are not the most important papers. An interesting chapter by Schittenhelm discusses undernutrition and overnutrition and the "mehlnährschaden" of Czerny and Keller. The subjects in the section on avitaminosis and hypovitaminosis are well presented. The final section is an interesting discussion of nutrition as a public health problem, in which evidence regarding the requirements of different peoples is gathered together and discussed in the light of current information.

Principles of Healthful Living. By Edgar F. Vnn Buskirk, Ph.D., Professor of Hygiene and Health Education, Stephens College. Edited by Wilson G. Smille, M.D., Professor of Public Health, Cornell University Medical College. Cloth. Price, \$3. Pp. 386, with illustrations. New York: Dial Press, 1938.

This is a good textbook on hygiene at the college level. It is also a good reference book for the home, assuming that the education of the family is of high school level or above. It is not sufficiently appealing in style or treatment for the more or less casual reading of those who are mildly interested but not seriously concerned in making a study of health and hygiene. It deals in a comprehensive manner with the structure and functions of the body and its environment, placing a highly desirable emphasis on preventive medicine and at the time giving introductory information with relation to the principal diseases which afflict man. It does not encourage self medication but encourages what the author calls "reflective thinking" as a means of evaluating advertising claims with relation to health and attempts to develop a critical attitude toward such claims without at the same time discrediting honest commercial promotion. It should make a good basis for any course in hygiene and healthful living or for collateral reading and reference. In the critical sections relating to diet, the use of narcotics and stimulants, personality development and mental hygiene—in short, those places where faddism might easily have crept in—it is eminently sound. The book is attractively printed, with many simple and clear diagrams illustrating the anatomic structures, and is embellished with numerous photographs of excellent quality, sharply reproduced and intelligently employed. It has a good bibliography and an excellent index.

A banana: Fruto de todo o ano alimento-medicamento. Pelo Dr. Vleente Henriques de Gouveia. Resumée en français. Paper. Pp. 75, with 18 illustrations. Funchal, Portugal: The Author, 1938.

This is a discussion in Portuguese, with a French summary, about the composition and nutritional value of the banana. Unfortunately no references are provided to the original literature and the monograph itself presents no new facts.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Corporations: Group Health Association, Inc., Held Not Illegally Engaged in the Corporate Practice of Medicine or in the Insurance Business.—Group Health Association, a corporation not for profit, was organized under the laws of the District of Columbia providing for corporations for "benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts." It undertook to provide medical and hospital services to its members and their dependents on a monthly prepayment basis. According to the published report, its membership is "limited to employees of the government in certain of the administrative branches." It entered into a contract with the Home Owners Loan Corporation whereby the latter agreed to pay \$40,000 in consideration of the association's providing for two years from Nov. 1, 1937, "substantially complete medical and hospital service to such employees of the Home Owners Loan Corporation as care to join it on a reasonable monthly payment basis." The United States District Attorney for the District of Columbia, claiming that the association was illegally engaged in the practice of medicine in violation of the Healing Arts Practice Act, notified the association that unless it suspended immediately its activities he would file a bill for an injunction or institute proceedings for the involuntary dissolution of the corporation. The Superintendent of Insurance for the District of Columbia contended that the association was engaged in the business of insurance in violation of the insurance laws of the District of Columbia. The association thereupon filed a bill of complaint in the district court of the United States for the District of Columbia against the district attorney and the superintendent of insurance. The defendants moved that the bill of complaint be dismissed.

Group Health Association, said the district court, was not practicing medicine in the sense that it itself prescribed for the sick. It was the contention of the association that it entered into contracts only with duly licensed physicians who themselves attended its members and if necessary prescribed for them. The court could see no reason why an individual or a group of individuals may not contract with a physician, or a group of physicians, for medical services for a stipulated period at a fixed compensation without violating the Healing Arts Practice Act. It seemed to the court that such a group of individuals might incorporate themselves for their own mutual benefit for the same purpose and that such a corporation, not for profit but for the mutual benefit of its members, would not be engaged in the practice of medicine or would not be holding itself out as doing so. While a corporation can act only through its agents and employees, the physicians with whom Group Health Association contracted to render medical services were, in the opinion of the court, independent contractors, for the association "does not in any way undertake to control the manner in which they attend or prescribe for their patients."

While the court expressed itself as having more difficulty with the contract between the association and the Home Owners Loan Corporation, it concluded that the medical and hospital services which the association agreed to furnish to the members of that corporation were substantially the same as those furnished to its own members. No profit was to be made for the association or its members.

The purpose of the Healing Arts Practice Act, the court continued, was to protect the public from quacks, the ignorant and incompetent. The activities of the association in no way tended to commercialize the practice of medicine, as the court viewed them; the association was not in the business of making money by furnishing medical services to any one who might come along. The court did not believe that the cases bearing on the right of a corporation to practice law were

closely analogous, "they being based on the common law and governed by the courts independently of any statute." For the reasons stated, the court held that the activities of the association did not constitute a violation of the Healing Arts Practice Act.

The contention of the superintendent of insurance that the association was unlawfully engaged in the business of insurance was based on the following provision of the insurance laws of the District of Columbia:

Every corporation . . . transacting business in the District of Columbia, which collects premiums, dues, or assessments . . . and which provides for the payment of indemnity on account of sickness or accident, or a benefit in case of death, shall be known as "health, accident, and life insurance companies or associations."

This provision, the court pointed out, does not include all "insurance" companies but only those which provide for the "payment of indemnity on account of sickness"; it does not include necessarily contracts "to indemnify," but is limited to those which provide for the "payment" of indemnity. The word "payment," the court continued, as ordinarily used means the payment of money, and the court could find no reason to believe that the word "is used in a different sense in the statute or that it is equivalent to 'indemnity.'" In the opinion of the court, the association was not engaged in the business of insurance within the meaning of the quoted provision of the law.

Accordingly, the district court overruled the motion to dismiss the bill of complaint.—*Group Health Ass'n v. Moor et al.*, 24 F. Supp. 445.

Malpractice: Volkmann's Paralysis Allegedly Resulting from Improper Application of Plaster of Paris Cast.

—Dewey Dark Jr., a boy aged 6 years, suffered greenstick fractures of both the ulna and the radius of the left arm on Thursday, March 4, 1937. Dr. Brown, a local physician, was called in but, since in his opinion it was necessary to "x-ray" the arm before administering any treatment, the child was taken to Dr. McAdams in a neighboring town. Dr. McAdams, after studying roentgenograms, reduced the fractures and applied a plaster of paris cast "next to the flesh," bending the elbow just before the cast hardened, which caused the cast to wrinkle at the elbow. The following day the arm began to swell, but Dr. Brown did not believe that the cast needed loosening. Saturday and Sunday nights Dr. Brown administered hypodermics and on Sunday loosened the bandage. When the child was taken back to Dr. McAdams on Monday the physician removed the dressing and drained and sterilized blisters which had formed on the top of the arm and on the hand. According to his testimony, at that time the pulse was good, there was no blueness in the fingers and the child could move his hand. The father testified, however, that at that time "inside the elbow it was black." Although the physician urged the father to hospitalize the child, the father failed to do so for two more days, in the meantime bringing the child to Dr. McAdams each day. The child was hospitalized Wednesday, the 10th, at which time he had a temperature of 103 F. Dr. McAdams removed the splint and the dressing and elevated the arm on a pillow. While the child was in the hospital, according to Dr. McAdams, the "temperature went down to practically normal, swelling was much better, the blisters looked better, he had a good pulse, and movement in his wrist and fingers" and he was free of pain. Over Dr. McAdams's objections the father removed the child from the hospital on March 12 and dismissed Dr. McAdams from the case, informing the physician that "he could get the boy attended to nearer home," mentioning a Dr. Cooper and saying nothing concerning Dr. Brown. Consequently Dr. McAdams gave Dr. Brown no instructions for treatment. Apparently, however, the father placed the child under Dr. Brown's care from then until March 22, when he was taken to the Dr. Cooper just referred to. When Dr. Cooper came into the case he found that the arm was swollen twice the normal size, the child had a high temperature, there was "no circulation" and the tissue was sloughing off in a spot about 2 inches long by 1½ inches wide. May 16, on Dr. Cooper's advice, the child was taken to Dr. Speed, a bone specialist in Memphis. Roentgenograms, Dr. Speed

testified, while showing a fracture of both bones of the forearm, destruction of one bone, osteomyelitis of this bone and to a certain extent other bones, showed excellent apposition of the bones at the points of fracture. Apparently Volkmann's paralysis had developed, the fingers had become stiff and the arm was useless, and subsequent procedures by the specialist were fruitless.

The father and the child subsequently sued Dr. Brown and Dr. McAdams for malpractice. The substance of their complaint was that "there was a want of skill on the part of McAdams and Brown, who acted jointly in applying the treatment—that the cast was applied too tightly, and when it was bent to accommodate the arm in a sling, wrinkles formed in the interior of the cast and, when it set or hardened, these wrinkles bruised the flesh when swelling occurred—a condition brought about through failure of the physicians to place yielding or resilient material between the flesh and the cast." From a judgment for the plaintiffs the defendants appealed to the Supreme Court of Arkansas.

The determining questions, as the Supreme Court viewed the controversy, were whether or not the cast was applied too tightly and whether or not it was good medical practice to place the cast in contact with the skin. From the fact, said the Supreme Court, that wrinkles did form in the cast at or near the elbow, it cannot be concluded that the infection complained of was caused thereby, and the evidence adduced justifies no such conclusion. Dr. Speed testified that the disability of the child was due to Volkmann's paralysis, which can result from a number of different causes: It might be the result of a direct injury to the blood vessels of the arm when the blood supply is cut off to the muscles; it might be due to hemorrhage or swelling within the fasciae covering of the arm, or it might be due to stricture due to splinting or pressure. He was unable to tell the original cause of the trouble but, in view of the testimony with regard to the circulatory condition—the presence of radial pulse, which indicates that blood is being supplied to the parts, and the movement of the fingers—he believed that when the child left the hospital on March 12 "there had been no serious or permanent interference, and with proper care from then on the condition should have improved, and the patient should have recovered." Dr. McAdams, in his opinion, handled the case well "throughout the treatment of the fracture, both regarding the x-raying of it, the reduction of the fracture, the apposition of the bones, the type of immobilization which was used, and the instructions which were given with regard to the kind of precautions necessary." Dr. Speed saw no objection "if the arm is almost straight to bringing it to right angle position after the splint is applied."

Six other expert witnesses, called on behalf of the plaintiffs, testified that the methods Dr. McAdams used were proper. Dr. Govar, another physician witness called by the plaintiffs, testified that it was optional with the physician whether splints or a cast be used to accomplish immobilization but that he wouldn't deem it advisable to place plaster of paris casts against the skin because "if a person is hairy the hair will join the cast, and if the skin is tender you may get a burn." No physician, said the court, testified for the plaintiffs that direct application of the cast to the skin would be improper from a professional standpoint. Dr. Govar's aversion to plaster of paris was based on the possibility that hairs on the arm might become attached to the cast "and if the skin is tender you may get a burn." There is no testimony in the record that the blisters caused infection or that the deep-seated malady was produced by plaster of paris burns, and Dr. Speed testified that direct application was generally approved. There is no testimony in the record to show that the cast was too tight when first applied. There is testimony that within a short time swelling occurred and that proper treatment probably would have been to loosen the tension. Dr. McAdams cannot be charged with such failure for he had no opportunity to act. The plaintiffs' entire case is predicated on the physician defendants' negligence and want of skill when the operation was performed.

Our conclusion, continued the court, is that the plaintiffs failed to support their allegations with substantial evidence. This is a case in which a layman took chances and experi-

enced misfortune of a tragic nature. If the doctrine *res ipsa loquitur* applied, the judgments might be sustained. But it does not. Medicine and surgery are inexact sciences, and physicians are not guarantors of results. Our view is that permanent injuries to the child were occasioned by the father's own negligence or error of judgment in not leaving the patient with Dr. McAdams when it became apparent that infection had developed.

The judgments in favor of the plaintiffs were reversed and the causes were dismissed.—*Brown et al. v. Dark (Ark.)*, 119 S. W. (2d) 529.

Compensation of Physicians: Liability of Third Person for Medical Fees.—Aileen Yaffe was injured while riding in the automobile of one William Yaffe. After the accident William sent her to a hospital in an ambulance and telephoned the plaintiff, a physician, and employed him to treat her. The plaintiff rendered medical services to the patient for four and one-half months. About two and one-half months after the accident Simon Yaffe, the stepfather of the patient and the father of William, visited the patient at the hospital and at that time had an interview with the plaintiff. The plaintiff claimed that Simon requested him to continue his services and told him to endeavor to get William to pay as much of the bill as he could but that he, Simon, and his wife would be responsible for the bill. Simon, his bookkeeper and his wife, who were present at the interview with the plaintiff, denied that he had made any such agreement. The plaintiff then brought suit against Simon, William and Aileen, the defendants, for \$2,750 as payment for his services. As a defense, Simon pleaded that the alleged contract was void under the statute of frauds because it was not in writing. From a judgment in favor of the plaintiff against all the defendants, Simon appealed to the Supreme Court of Arkansas.

The evidence, said the Supreme Court, showed that Simon merely promised the plaintiff that he would take care of the bill if William did not. The undertaking on the part of Simon, therefore, was collateral and not original. It was an undertaking on his part to pay the debt of another if the original debtor failed to pay the same. In the judgment of the court, therefore, the undertaking was within the statute of frauds and, because it was not in writing, was void. Accordingly, the Supreme Court reversed the judgment as to Simon and dismissed the cause as to him.—*Yaffe v. Pickett (Ark.)*, 121 S. W. (2d) 93.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American College of Surgeons, Philadelphia, Oct. 16-20. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
- American Public Health Association, Pittsburgh, Oct. 17-20. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Association of American Medical Colleges, Cincinnati, Oct. 23-25. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
- Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.
- Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
- Gulf Coast Clinical Society, Mobile, Ala., Oct. 26-27. Dr. Clyde C. Rouse, 56 St. Joseph St., Mobile, Ala., Secretary.
- International Society of Medical Health Officers, Pittsburgh, October 16. Dr. Leon Banov, 12 Mill Street, Charleston, S. C., Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
- National Society for the Prevention of Blindness, New York, Oct. 26-28. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.
- New York State Association of Public Health Laboratories, Albany, Nov. 3. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Oct. 23-27. Dr. J. D. McCarthy, 107 S. 17th St., Omaha, Secretary.
- Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Altz Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Tri-State Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

38: 187-370 (Aug.) 1939. Partial Index

- Treatment of Hemolytic Streptococci Infections During Pregnancy and Puerperium with Sulfanilamide and Immunotransfusion. C. A. Chandler and C. A. Janeway, Boston.—p. 187.
- *Toxemia of Pregnancy: Types, Etiology and Treatment. M. B. Strauss, Boston.—p. 199.
- Obstetric Management of Patients with Toxemia. W. J. Dieckmann and I. Brown, Chicago.—p. 214.
- *Macrocytic Anemia of Pregnancy and Anemia of Newborn. J. A. Ritter and W. J. Crocker, Philadelphia.—p. 239.
- Treatment of Early Abortion. C. E. Galloway and T. D. Paul, Evanston, Ill.—p. 246.
- Studies on Reconstruction of Fallopian Tube: Preliminary Report of Original Technique. J. R. Geppert, New York.—p. 256.
- *Treatment of Dysmenorrhea with Testosterone Propionate: Biologic Effects of Testosterone Propionate in Sexually Mature Woman. U. J. Salmon, S. H. Geist and R. I. Walter, New York.—p. 264.
- Tubal Sterilization by Madlener Technique. E. von Graff, New York.—p. 295.
- Typhoid Fever in Pregnancy: Probable Intra-Uterine Transmission of Disease. A. W. Diddle and R. L. Stephens, Iowa City.—p. 300.
- Water Exchange and Salt Balance in Hyperemesis Gravidarum. F. L. McPhail, Great Falls, Mont.—p. 305.
- Effect of Temperature on Vitality of Spermatozoa. A. I. Weisman, New York.—p. 313.
- *Control of Pain with Local Anesthesia After Repair of Episiotomies. G. W. Hunter, Fargo, N. D.—p. 318.
- Severe Menorrhagia as Only Symptom of Essential Thrombocytopenic Purpura Cured by Splenectomy. S. L. Israel and T. H. Mendell, Philadelphia.—p. 339.
- Interstitial Pregnancy Following Salpingectomy. I. Forman, Philadelphia.—p. 344.
- Interstitial Pregnancy: Five Months' Gestation, with Observation of Phenomenon of Rupture at Time of Operation. A. J. Kobak, Chicago.—p. 346.
- Neglected Sign for Roentgenologic Diagnosis of Intra-Abdominal Dermoid Cyst. G. Danielius, Chicago.—p. 348.

Toxemia of Pregnancy.—Strauss declares that the term "toxemia of pregnancy" has served for generations and still serves as a diagnostic waste basket to cloak ignorance. Medical prepossession with mysterious and unidentified "toxins" has prevented intelligent study of the various disorders combined under this misnomer. Writers have wisely refrained from defining what toxemia is. To each the word carries certain connotations; rarely does it mean quite the same thing to any two. There remains one simple method of dividing this heterogeneous group of "toxic" women into at least two main classes, and that is by studying the state of affairs antecedent and subsequent to the "toxemia." Such study reveals that about 80 per cent of the women designated as having "toxemia" actually have chronic vascular or renal disease before and after the gravid state, and an additional 5 per cent have such disease in acute form. The remaining 15 per cent of such women have had no demonstrable abnormality before pregnancy or after the pregnancy in which abnormalities called "toxemia" occurred. Further, these women under proper management will have subsequent uneventful pregnancies. It is this group for which the designation "water-retention toxemia" seems appropriate. A low sodium intake is one means of eliminating undue water retention. The development of water-retention toxemia may be prevented by maintaining the pregnant woman's plasma proteins at a normal level by an adequate diet and avoiding excessive sodium ingestion.

Macrocytic Anemia of Pregnancy and of Newborn.—Ritter and Crocker studied the relationship between anemia of the newborn and the hematologic picture in the mother and believe that the anemia of both the mother and the infant is due to a dietary deficiency. Only one case has been encountered in the maternity service of the Philadelphia General Hospital. The response of the mother to liver therapy was inadequate and her severe reactions to transfusions precluded

their further use. The reticulocyte response was poor both during pregnancy and after parturition. Therefore, either a specific need for the liver was not indicated or an inadequate dose or an impotent extract was used. Nevertheless the mother did improve after delivery, when there was a cessation of vomiting and diarrhea and better utilization of a balanced diet. The deficiency factor which produced the anemia in the mother may possibly have been likewise deficient in the infant. It appeared that the maturation of the erythron was arrested at a fetal level because of the infant's inability to utilize a factor which it could not obtain in utero. In fact, there appears to have been little response to combined therapy and transfusions seemed only to carry the infant over until such a time as its own erythropoietic system could function at a more mature level. The infant's reticulocyte response was definitely poor in spite of marked anemia. Once a higher level of maturation of the infant's red blood cells was attained, probably conditioned by dietary intake of the deficient factor, steady improvement was noted. Oddly enough there was not an "adequate" reticulocyte response in the recovery phase. The authors can only say that the erythropoietic system was either depressed or inhibited in some inexplicable manner and improvement occurred only when this was overcome. Why such factors should work selectively on the erythropoietic system does not seem explainable except by some mechanism such as produces pernicious anemia in adults.

Treatment of Dysmenorrhea with Testosterone Propionate.—Salmon and his associates used testosterone propionate in the treatment of thirty women suffering from dysmenorrhea. The level of testosterone tolerance was established at approximately 500 mg. Administration of upward of 500 mg. resulted in the appearance, in some of the cases, of masculinization phenomena and evidence of estrogen deficiency. Normal cyclic phenomena (clinical and morphologic) returned spontaneously in all cases within two months after treatment. With doses of 300 mg. or less neither androgenic nor estrogenic deficiency effects were produced. Symptomatic relief of twenty-six of the thirty women was achieved. The suggestion is made that the biologic effects of testosterone propionate (in doses of 500 mg. or more) in women is brought about by inhibition of the gonadotropic factors of the hypophysis with consequent suppression of ovulation, estrogen and progesterone formation and menstruation, as well as by inactivation of the circulating estrogens and estrogen stores in the body. The therapeutic effects of smaller doses are probably the result of partial inactivation or modification of the action of the estrogens and progesterone. The theory is advanced that functional dysmenorrhea may be caused by an androgen deficiency.

Local Anesthesia for Pain of Episiotomies.—Reports of the successful use of soluble anesthetic solutions in rectal surgery with the purpose of relieving patients from postoperative pain have suggested to Hunter the use of this type of medication following episiotomy and other perineal repair. The results with twenty-five patients and twenty-five alternate patients taken as controls were encouraging. Two types of solutions were used: procaine base 1.5 per cent, butesin 6 per cent, benzyl alcohol 5 per cent and oil of sweet almond, the other solution being an aqueous one containing 1 per cent piperidinopropanedio diphenylurethane hydrochloride. Following repair of the episiotomy or perineal laceration, 10 cc. of warmed solution is drawn into a dry Luer Lok syringe. The solution is injected slowly into the deeper tissue, care being taken that it does not go immediately beneath the skin or mucous membranes. Following injection, massage of the parts assures an even distribution of the anesthetic. The needle is inserted about one-fourth inch on each side of the incision and the solution is injected fanwise. The injection is made while the patient is still under the effects of the general anesthetic given during repair. The water soluble solution was used for ten patients and they were free from pain until the third or fourth postpartum day, at which time the effects of the anesthesia had apparently disappeared. They then experienced as much pain as the controls. The oil soluble anesthetic, however, kept patients for the most part entirely free from distress. Healing did not appear to be impaired and no general toxic effects were observed.

American Journal of Public Health, New York

29: 821-982 (Aug.) 1939. Partial Index

- Care of Premature Infants. Ethel C. Dunham, Washington, D. C.—p. 847.
- Effectiveness of Different Systems of Collecting Vital Statistics Data. J. V. DePorte, Albany, N. Y.—p. 856.
- Infection of Air: Bacteriologic and Epidemiologic Factors. W. F. Wells, M. W. Wells and S. Mudd, Philadelphia.—p. 863.
- *Paratyphoid Fever in Massachusetts. R. F. Feemster and G. W. Anderson, Boston.—p. 881.
- Relation of Coroner's Office to the Bureau of Vital Statistics. S. R. Gerber, Cleveland.—p. 889.
- Analysis of Subsequent Course of Diagnosed Cases of Tuberculosis. Ruth R. Puffer, H. C. Stewart and R. S. Gass, Nashville, Tenn.—p. 894.
- Effects on Health of Gases Produced by Electric Arc. L. W. La Touzsky, Philadelphia.—p. 912.
- Comparative Study of Mouse and Guinea Pig Inoculation Methods in Diagnosis of Rabies. S. E. Sulkin and J. C. Willett, St. Louis.—p. 921.
- San Francisco's Hotels Are Examined for Cross Connections. J. C. Geiger, A. B. Crowley and G. E. Arnold, San Francisco.—p. 927.

Paratyphoid Fever in Massachusetts.—Feemster and Anderson state that a sudden increase in paratyphoid fever occurred in Massachusetts in 1937. From a level of about six cases a year the number reported rose to 267. The cases reported in 1937 fall readily into five groups. There were four food-borne outbreaks (220 cases), and the remainder (forty-seven) were sporadic cases; these occurred before the outbreaks and were widely scattered throughout the state. It has been impossible to trace any connection between these outbreaks. People infected in the first outbreak may have carried the organism to many other parts of the state, but so far no such individuals have been found. The fact that twenty with positive stools and eleven others with positive agglutination tests were entirely without symptoms emphasizes the importance of sub-clinical infections in this disease and illustrates why its control may be difficult. The persistence of the organism in the stools of convalescents adds an additional problem. Almost half of those who showed positive stools were still carrying the organism at the end of five weeks, one eighth at the end of nine weeks and others continued positive until the twenty-eighth, thirty-second and forty-ninth weeks and there were five permanent carriers. In the first nine months of 1938, sixty-six cases were reported. Six small outbreaks, forty-eight cases, occurred in families or in groups eating a common meal. The other eighteen cases were sporadic.

Archives of Dermatology and Syphilology, Chicago

40: 345-520 (Sept.) 1939

- Factor Analysis of Acne Complex with Therapeutic Comment. J. H. Stokes, Philadelphia, and T. H. Sternberg, Peoria, Ill.—p. 345.
- Management of Intractable Urticaria. E. F. Traut, Chicago.—p. 368.
- Nodular Myxedema Complicating Thyrotoxicosis: Report of Case. F. Handley and J. G. Downing, Chelsea, Mass.—p. 374.
- *Pigmentation Following Use of Iron Salts. C. E. Reyner, Detroit.—p. 380.
- Staphylococcus Ambotoxoid: Experience with Its Use in Treatment of Acne Vulgaris and Other Pyogenic Dermatoses. L. E. Anderson, Springfield, Mass., and J. H. Stokes, Philadelphia.—p. 382.
- Multiple Pigmented Nevi: Report of Case. H. L. Arnold Jr., Ann Arbor, Mich.—p. 386.
- Hemosiderin Histiocytoma of Skin. J. C. Bernstein, Baltimore.—p. 390.
- *Mouse Brain Antigen: Intravenous Use in Diagnosis of Lymphogranuloma Venereum. D. A. Decker, Allentown, Pa.; O. Canizares and R. F. Reider, New York.—p. 397.
- Recurrent Herpetiform Dermatitis Repens. S. Ayres Jr. and N. P. Anderson, Los Angeles.—p. 402.
- Dermatitis Due to Sulfur-Meat Complex: Report of Case. J. C. Bernstein, Baltimore.—p. 414.
- Patterned Alopecia About Calves and Its Apparent Lack of Significance. F. Ronchese and R. R. Chace, Providence, R. I.—p. 416.
- Epidermodysplasia Verruciformis (Lewandowsky and Lutz). M. Sullivan and F. A. Ellis, Baltimore.—p. 422.

Pigmentation Following Use of Iron Salts.—Reyner reviews the reports of the eight cases of (permanent) pigmentation from the use of iron salts in the treatment of ivy poisoning. He cites an additional case of pigmentation in which complete removal of the iron deposits was effected by ultraviolet irradiation (with a water-cooled lamp). Heretofore such pigmentation has been considered permanent.

Diagnosis of Venereal Lymphogranuloma.—Decker and his associates find that the intravenous injection of 0.1 cc. of mouse brain antigen is a reliable procedure for corroborating the results of the intradermal Frei test in the diagnosis of

venereal lymphogranuloma. When they injected 0.1 cc. of mouse brain antigen into thirty-five patients with venereal lymphogranuloma of the inguinal type, thirty gave a positive and five a doubtful reaction. All twenty-one patients with venereal lymphogranuloma of the genitorrectal type gave a positive reaction. Of seventy control subjects given an injection of 0.1 cc. of mouse brain antigen, five gave a doubtful and the rest a negative reaction. A patient who had had a bubo of venereal lymphogranuloma incised four years before and had apparently had no recurrence gave a typical reaction to the intravenous injection of 0.1 cc. of Frei antigen (mouse brain) intravenously. This would support the view that the reaction to intravenous injection behaves similarly to that to intradermal injection, remaining positive after active signs of the disease are no longer present.

California and Western Medicine, San Francisco

51: 73-144 (Aug.) 1939

- Sulfanilamide and Sulfapyridine in Treatment of Various Infections. C. S. Keefer, Boston.—p. 81.
- Congenital Malformations of Rectum and Anus: Their Surgical Treatment. L. R. Chandler, San Francisco.—p. 84.
- The Patient's Concept of Maternity Care as Obtained from Popular Sources. G. W. Coon, Riverside.—p. 92.
- Present Status of Artificial Fever in Treatment of Syphilis. N. N. Epstein, San Francisco.—p. 94.
- Santiago Ramón y Cajal. J. B. Doyle, Los Angeles.—p. 97.
- Cure of Gonorrhea: Immunologic Problem. E. W. Beach, Sacramento.—p. 100.
- *Herpes Zoster: Treatment with Thiamin Chloride. M. J. Goodman, Eureka.—p. 105.

Thiamin Chloride for Herpes Zoster.—Since the beneficial influence of thiamin chloride in neuritis and its prevention of certain degenerative nerve changes is acknowledged, and since it has been established that the prominent feature in herpes zoster is a neuritis with degenerative changes, Goodman treated five such cases with subcutaneous administration of thiamin chloride with gratifying results. In comparing the results obtained in these cases with similar ones treated by local applications and salicylates the author finds that the former treatment is a logical and more satisfactory means of combating herpes zoster. The pain is relieved more promptly, the lesions clear up at an earlier date and the total disability time is notably decreased. In one instance a longer period (than six or seven injections of 3,000 units of thiamin chloride daily or every other day) of treatment was required. The age (71) of the patient may have been a factor. The results obtained suggest that further investigation in this field is warranted.

Canadian Medical Association Journal, Montreal

41: 111-222 (Aug.) 1939. Partial Index

- *Use of Vitamin K and Bile Salts in Prevention and Control of Hemorrhagic Diathesis in Obstructive Jaundice. Preliminary Report. S. R. Townsend and E. S. Mills, Montreal.—p. 111.
- Menorrhagia, with Special Reference to Occult Hyperthyroidism. E. V. Shute, London, Ont.—p. 115.
- *Intestinal Protozoa of Man in Saskatchewan. M. J. Miller, New Orleans.—p. 120.
- Surgical Procedures in Pulmonary Tuberculosis. A. J. Grace, London, Ont.—p. 124.
- Appendicitis. G. Murray, Toronto.—p. 134.
- Relative Value of Different Essential Phases in White Cell and Differential Count in Diagnosis of Appendicitis. F. Smith, Kelowna, B. C.—p. 138.
- Use of Fascia Lata in Treatment of Fallen Metatarsal Arches. E. E. Shouldice, Toronto.—p. 142.
- Human Electro-Encephalogram and Its Clinical Significance. J. E. Goodwin and G. E. Hall, Toronto.—p. 146.
- Early Diagnosis of Expanding Lesions of Brain. L. H. McConnell, Saskatoon, Sask.—p. 151.
- External Hydrocephalus. A. E. Harbeson, Kingston, Ont.—p. 158.
- Rare Cause of Fatal Hematemesis. R. D. Roach, Moncton, N. B.—p. 173.
- Relation of Achlorhydria to Nutritional Anemia of Children. R. Wilson, Vancouver, B. C.—p. 176.
- Significance of Indigo, Cyanogen and Thiocyanate in Tumor Cases. J. E. Davis and H. E. Schmitz, Chicago.—p. 178.

Vitamin K and Bile Salts for Hemorrhagic Diathesis.—Ten cases of obstructive jaundice are presented by Townsend and Mills in which the plasma prothrombin levels were low and in which there was an abnormal tendency to bleed, as indicated by prolonged clotting times. Administration of vitamin K

and bile salts restored the clotting time to normal. One failure with no adequate explanation is recorded. No abnormal bleeding followed operation on patients treated with vitamin K and bile salts. In one case there was a further disturbance in the plasma prothrombin after operation with an abnormal tendency to bleed. Prophylactic therapy is suggested as a safeguard. It is suggested that the tendency to give patients with jaundice a low fat diet predisposes to K avitaminosis, which may be accentuated further by the frequently accompanying nausea and vomiting.

Intestinal Protozoa of Man.—As information regarding the incidence of intestinal parasitic infection in Canada is lacking, Miller obtained data on the incidence of such infection in Saskatoon, Sask., by examining the stools of 254 persons. Ninety-seven of these, or 38.2 per cent, were positive for intestinal parasites. Only protozoan parasites were found. No helminth eggs were recovered from the stools, although one immature *Ascaris*, passed by a 6 year old child, was sent in by a local physician. Seven species of Protozoa were found. Five of these belonged to the class Rhizopoda and the two remaining species belonged to the class Mastigophora. Of the 254 stools examined 149 were from hospitalized and nonhospitalized clinical patients, forty of whom, or 26.8 per cent, showed parasitic infections. Only five of the infected persons harbored more than one parasite, and these were all double infections. An infection incidence of 39.7 per cent was obtained in a group of fifty-eight healthy persons. Multiple infections were found in two persons. In forty-seven orphan asylum children the incidence of parasitic infections was approximately 72 per cent. Multiple infections were quite common in this group, and of the thirty-four infected children eight had triple infections, eleven had double infections and the remaining fifteen harbored only one species. *Endamoeba coli* was found most often in all three groups. In the orphans this was followed by *Endolimax nana*, then *Endamoeba histolytica*. The observations of Fantham and Porter together with the present results, the author states, tend to demonstrate that parasitic infection is widespread throughout Canada and that even climates as severe as those found in western Canada are tolerated by this parasite. Therefore competent stool examinations should play an important part in diagnosing otherwise unexplained diseases of the large intestine.

Florida Medical Association Journal, Jacksonville

26: 57-108 (Aug.) 1939

- Puerperal Infection versus the General Practitioner. W. C. Roberts, Panama City.—p. 67.
Five Hundred Consecutive Major Operative Gynecologic and Obstetric Cases. F. Richards, Jacksonville.—p. 72.
Menace of State Medicine. R. F. Godard, Quincy.—p. 77.
Jellyfish and Portuguese Man-of-War Stings. E. J. Thomas, Miami Beach.—p. 83.
Present Status of Cancer Therapy. E. M. Hendricks, Fort Lauderdale.—p. 87.
Relation of Sympathetic Nervous System to Health and Longevity. T. M. Rivers, Kissimmee.—p. 90.

Journal of Immunology, Baltimore

37: 85-178 (Aug.) 1939

- Studies on Serum Complement of Guinea Pigs Infected with Trypanosoma Equiperdum. I. Horner, Pecs, Hungary.—p. 85.
Gonadotropic Inhibitory Substance and Precipitin in Blood of Monkeys Receiving Gonadotropic Hormone Preparations. R. K. Meyer and H. R. Wolfe, Madison, Wis.—p. 91.
Simplified Formula for Diphtheric Toxin Broth. J. H. Mueller, Boston.—p. 103.
Effect of Hypophysectomy on Immunity and Hypersensitivity in Rats with Brief Description of Operative Technic. N. Molomut, New York.—p. 113.
Disintegration of Bacteria by Mechanical Means: I and II. P. H. Langner Jr. and J. S. Forrester, Philadelphia.—p. 133.
Id.: III. Comparative Reactions After Intracutaneous Injection of Filtrates of Mechanically Disintegrated Bacteria and of Heat Killed Whole Organism Suspensions. J. S. Forrester and P. H. Langner Jr., Philadelphia.—p. 141.
Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: V. Lack of Interference of Blood Group A Substance in Culture Mediums with Chemical and Serologic Studies on Streptococcus Haemolyticus. W. Henle and Gertrude Henle, Philadelphia.—p. 149.
Group Specific Agglutinins in Rabbit Serums for Human Cells: VI. Immune Specific M Agglutinins. K. M. Wheeler, P. B. Sawin and C. A. Stuart, Providence, R. I.—p. 159.
M Agglutinin of Rhesus Monkeys. K. M. Wheeler and C. A. Stuart, Providence, R. I.—p. 169.

Journal of Investigative Dermatology, Baltimore

2: 151-230 (Aug.) 1939

- Clinical and Experimental Study of Interstitial Keratitis. J. V. Klauder, with assistance of E. R. Gross and H. F. Robertson, Philadelphia.—p. 157.
Notes on Anatomy and Pathology of Skin Appendages: I. Wall of Intra-Epidermal Part of Sweat Duct. H. Pinkus, Eloise, Mich.—p. 175.
Cultural Characteristics of Pityrosporum Ovale: Lipophilic Fungus. Rhoda W. Benham, New York.—p. 187.
*Further Studies on Therapy of Acne Vulgaris with Modified Liver Extract. W. Marshall, Appleton, Wis.—p. 205.
Experimental Use of Lipocain in Treatment of Psoriasis: Preliminary Report. C. D. Stewart, D. E. Clark, L. R. Dragstedt and S. W. Becker, Chicago.—p. 219.

Liver Extract for Acne Vulgaris.—Marshall used boiled liver extract in the treatment of fourteen cases of acne vulgaris and obtained satisfactory results. The subcutaneous injection of liver extract, 0.4 cc., is given so that a sufficient amount of the probably specific vitamin (probably vitamin H, termed the X factor by Boas and the skin factor by Gyorgyi) may be had. The author says this reservedly, although he is not acquainted with any other material in the extract which would increase its dermatologic potency on boiling. Since the seborrhea seemed to be the first component of the acne complex to improve, it appears that one may be dealing with a human counterpart of status seborrhoicus in experimental animals. When injectable liver extract is boiled for thirty minutes, its acne-improving factor seems to increase. When this boiled extract is given to patients already under routine liver therapy, their improvement appears more rapid.

Journal of Nutrition, Philadelphia

18: 105-216 (Aug.) 1939

- Vitamin B₁ Content of Human Milk as Affected by Ingestion of Thiamin Chloride. Agnes Fay Morgan and Edna Gavin Haynes, Berkeley, Calif.—p. 105.
Comparative Toxicity of Fluorine in Calcium Fluoride and in Cryolite. Margaret Lawrenz, H. H. Mitchell and W. A. Ruth, Urbana, Ill.—p. 115.
Comparison of Toxicity of Fluorine in Form of Cryolite Administered in Water and in Food. Margaret Lawrenz, H. H. Mitchell and W. A. Ruth, Urbana, Ill.—p. 127.
*Average Values for Basal Respiratory Functions in Adolescents and Adults. N. W. Shock and M. H. Soley, Berkeley, Calif.—p. 143.
Dietary Requirements of Guinea Pig, with Reference to Need for a Special Factor. M. D. Cannon and Gladys A. Emerson, Berkeley, Calif.—p. 155.
Minimal Vitamin A and Carotene Requirement of Rat. H. Goss and H. R. Guilbert, Davis, Calif.—p. 169.
Conditions Affecting Content of Chick Antidermatitis Vitamin in Yeast. W. H. Peterson and C. A. Elvehjem, Madison, Wis.—p. 181.
Influence of Massive Doses of Vitamin B₁ on Fertility and Lactation. B. Sure, Fayetteville, Ark.—p. 187.
Basal Metabolism of Connecticut State College Students. E. Charlotte Rogers, Storrs, Conn.—p. 195.

Average Basal Respiratory Functions.—In an attempt to determine the range in values of basal respiratory functions in normal adolescents and adults and to indicate changes that take place during adolescence, Shock and Soley recorded the respiratory rate, the respiratory volume per minute, the tidal volume, the concentration of oxygen and carbon dioxide in the expired air, the oxygen consumption and the alveolar carbon dioxide tension of fifty normal boys, fifty normal girls, forty-six normal adult men and forty normal adult women. In the children the tests were begun at the ages of 11 or 12 years and were repeated at intervals of six months over a period of five years. The adults ranged in age from 27 to 43 years. The adults were chosen from staff members and from university students who were presumably healthy (although no systematic medical examination was given) and in view of their sedentary activities the average values for metabolic tests may be somewhat lower than for the general population. In the adult group as many as sixty tests were made in triplicate only on two successive days on each subject. The authors tabulate the results of these studies and in conclusion state that the following was found to prevail: 1. In boys the minute respiratory volume increases between the ages of 12 and 14 years, owing to an increase in body size. 2. In boys the respiratory rate decreases between the ages of 14 and 16, the tidal volume increases, the concentration of oxygen in the expired air decreases and the expired carbon dioxide increases. 3. In girls the respiratory volume and tidal volume increase between the ages of 12 and 14 years. 4. The composition of the expired air in girls changes between the ages of 14 and 16 as it does in the boys,

but the change is not so clearly defined. In boys there is a significant increase in alveolar carbon dioxide tension between the ages of 12 and 14 years. No significant change in alveolar carbon dioxide tension was found in girls. 5. The average oxygen consumption per minute increases from the age of 12 to 16 years in both sexes. In respect to body size there is a decrease in oxygen consumption. 6. Most respiratory functions of girls of 16 are similar to those of adult women. 7. Sixteen year old boys breathe more rapidly and have a smaller tidal volume, higher concentration of oxygen and lower concentration of carbon dioxide in the expired air and a lower total oxygen consumption than adult men.

Journal of Pharmacology & Exper. Therap., Baltimore

66: 379-508 (Aug.) 1939. Partial Index

- Effects of Various Agents on Metabolic Rate in Experimental Hyperthyroidism. W. C. Cutting and G. B. Robson, San Francisco.—p. 389.
- Role of Molecular Oxygen in Antispirochetal Activity of Arsenic and Bismuth Compounds in Vitro. H. Eagle, Baltimore.—p. 423.
- Effect of Sulfhydryl Compounds on Antispirochetal Action of Arsenic, Bismuth and Mercury Compounds in Vitro. H. Eagle, Baltimore.—p. 436.
- Comparison of Actions of Prostigmine and of Guanidine on Activity of Choline Esterase in Blood Serum. Ann S. Minot, Nashville, Tenn.—p. 453.
- Action of Syntropan on Gastrointestinal Tract. B. B. Clark, E. B. S. Shires Jr., E. H. Campbell and C. S. Welch, Albany, N. Y.—p. 464.
- *Studies in Absorption, Distribution and Elimination of Alcohol: IV. Elimination of Methyl Alcohol. H. W. Haggard and L. A. Greenberg, New Haven, Conn.—p. 479.

Elimination of Methyl Alcohol.—Widmark is of the opinion that methyl alcohol is largely destroyed in the body and that the loss is at a uniform rate regardless of the amount present or the concentration in the blood. Haggard and Greenberg, to the contrary, state in summary that they find that: 1. More than 70 per cent of the methyl alcohol is eliminated in the expired air. 2. The elimination follows the principle defined for volatile substances which are largely nonreactive. 3. The amount eliminated in unit time is determined by the concentration of alcohol in the blood and the volume of pulmonary ventilation. 4. The curve obtained from the concentrations of methyl alcohol in the blood during elimination is not a straight line but an exponential curve. 5. The Widmark value β held by him to be a constant is not a constant but a variable influenced by all factors which influence the amount of methyl alcohol eliminated in unit time in the expired air.

Journal of Thoracic Surgery, St. Louis

8: 581-696 (Aug.) 1939

- Disease of Aberrant Intrathoracic Lung Tissue. S. O. Freedlander and P. W. Gebauer, Cleveland.—p. 581.
- Beck Operation (Heart): Report of Two Cases. A. L. Lockwood, Toronto.—p. 598.
- Treatment of Pulmonary Tuberculosis by Temporary Elimination of Number of Intercostal Nerves. F. Torek, New York.—p. 607.
- Patient Support for Thoracoplasties and Other Thoracic Operations. W. L. Howard, Battle Creek, Mich.—p. 613.
- Partial Thoracoplasty (with Extrafascial Apicolysis) and Contralateral Oleothorax. A. H. Aufses, New York.—p. 615.
- Extrapleural Apicolysis. A. R. Judd, Glen Gardner, N. J.—p. 622.
- Thoracoplastic Collapse of Acute Progressive Tuberculosis: Report of Five Cases. H. Meltzer, Ninette, Man.—p. 627.
- Immediate Effect of Scalenotomy on Size of Apical Tuberculous Cavities. J. H. Gibbon Jr., Philadelphia.—p. 633.
- Interposition of Colon Following Right Phrenic Nerve Interruption. C. Muschenheim and J. B. Amberson Jr., New York.—p. 638.
- *New Technique for Phrenic Crush. L. W. Frank, Louisville, Ky.—p. 644.
- Technic of Extrapleural Pneumothorax. F. S. Dolley, J. C. Jones, Los Angeles, and Jane Skillen, Olive View, Calif.—p. 646.
- Penetrating Gunshot and Stab Wounds of Thorax: Report of Eighty-Seven Cases. C. R. Steinke, Akron, Ohio.—p. 658.
- Gunshot Wound of Chest of Patient with Artificial Pneumothorax. E. F. Parker Jr., Nashville, Tenn.—p. 666.
- Experimental Lobectomy Using Bronchial Plugs. S. R. Rosenthal, E. H. Lambert, W. Van Hazel and P. H. Holinger, Chicago.—p. 668.
- Catheter for Bronchospirrometry. P. W. Gebauer, Cleveland.—p. 674.
- Bronchiogenic Carcinoma of More Than Five Years' Duration Treated by Radiotherapy: Report of Case. F. R. Harper, Denver.—p. 683.

Phrenic Crush.—Frank states that, after crushing of the main phrenic nerve for 1 cm., resection of large segments of any accessory nerves and division of the nerve to the subclavius muscle, only 50 per cent of his cases were successful as evidenced by a total paralysis of the diaphragm. Of the 50 per cent which were unsatisfactory, half showed only partial paralysis of the diaphragm; in the others an apparent paralysis was first produced and diaphragmatic movement became rees-

tablished in an average time of three months. As all the operations had been most carefully done, it became evident that other connections entering the phrenic nerve below the clavicle must exist. Therefore the author developed the following technic: The usual transverse incision for exposure of the phrenic nerve is employed. The accessory phrenic nerves are divided. The nerve to the subclavius muscle is resected as before. The phrenic nerve is then crushed for approximately 1 cm. and drawn upward into the neck for from 3.5 to 4 cm. It was thought that, by drawing the nerve upward, any filaments entering the phrenic nerve below the clavicle might be torn and hence the resulting paralysis of the diaphragm would last a much longer time. The incision is closed with subcuticular suture of fine silk with a split shot on each end of it. Since January 1935 the author has performed the foregoing operation on 246 patients and in every one complete paralysis of the diaphragm ensued. Following this type of operation the diaphragm remained paralyzed on an average of from ten to twelve months. Diaphragmatic movement then began, although that structure itself remained elevated. The amount of diaphragmatic excursion increased, and within from two to three months the diaphragm returned to its normal position and full normal respiratory movement.

Kansas Medical Society Journal, Topeka

40: 317-360 (Aug.) 1939

- What the General Practitioner Should Know About Ear, Nose and Throat Diseases. L. J. Birsner, St. Louis.—p. 317.
- Newer Knowledge of Central Vegetative Nervous System. R. R. Grinker, Chicago.—p. 321.
- *Recovery from Subacute Infectious Endocarditis. R. H. Major and L. H. Leger, Kansas City, Mo.—p. 324.
- Dermatitis Venenata: Practical Aspects and Innocuous Treatment. R. L. Sutton Jr., Kansas City, Mo.—p. 325.
- Treatment of Actinomycosis with Sulfanilamide: Report of Two Cases. M. T. Sudler and C. B. Johnson, Lawrence.—p. 330.
- Coarctation of Aorta: Case Report. E. R. Schwartz, Manhattan, and G. M. Tice, Kansas City.—p. 330.
- A County-Wide High School Tuberculin Testing Plan. R. R. Melton, Marion, and W. M. Tate, Peabody.—p. 332.

Recovery from Subacute Infectious Endocarditis.—Major and Leger report their second case of subacute infectious endocarditis in which recovery occurred following sulfanilamide and sulapyridine therapy. It must be kept in mind that occasionally patients with subacute infectious endocarditis recover spontaneously. However, the authors feel that in this instance, as in the previous one, recovery was due to the therapy employed. Also in both patients the relatively short duration of the illness was probably a decisive factor.

Medical Annals of District of Columbia, Washington

8: 223-254 (Aug.) 1939

- Supervised Obstetrics in a General Hospital: Review of Obstetrics. Garfield Memorial Hospital, 1938. R. B. Nelson Jr., Washington.—p. 223.
- Therapeutic Use of Iodized Oil in Chronic Bronchitis and Bronchiectasis. W. D. Tewksbury and E. R. Fenton, Washington.—p. 227.
- African Sleeping Sickness: Comparison with Dementia Paralytica and with Epidemic Encephalitis. E. de Savitsch and W. Freeman, Washington.—p. 231.
- Benign Paranoid Reactions. E. Klein, Washington.—p. 235.
- Argentaffinoma of Ileum: Report of Case. J. O. Warfield Jr., Washington.—p. 242.

Michigan State Medical Society Journal, Lansing

38: 645-740 (Aug.) 1939

- Pioneer Sanitarians in Michigan. E. E. Kleinschmidt, Ann Arbor.—p. 659.
- *Incidence of Idiopathic Hypertension in the Young. Frances L. MacCraken, Detroit.—p. 668.
- Specific Therapy of Pneumonias: II. Serum Therapy of Pneumococci. J. G. M. Bullowa, New York.—p. 670.

Idiopathic Hypertension in the Young.—MacCraken wonders whether the tendency on the part of the physician to regard malignant or idiopathic hypertension as a disease of the forties may not be due to the fact that blood pressures of younger persons are taken infrequently. In other words, as one becomes older intercurrent conditions arise or symptoms develop which take one to the physician for the express purpose of "having the blood pressure taken." This hypertension is then discovered and attributed to the age of the patient, whereas an earlier examination might possibly have at least disclosed a beginning hypertension of less severity. In the

consideration of this phenomenon, as an examiner for more than 10,000 women between the ages of 20 and 30 applying for positions as teachers, the author observed among other things a distinct variation in blood pressure. While the blood pressure of most of the women ranged around 120 mm. of mercury systolic and less, about one in twenty showed a rise of from 20 to 30 mm. or more. These rises in systolic pressure were not psychic as a rule but rather persistent over a series of tests. In only about 0.1 per cent was any causative factor isolated, though in each case a careful urinalysis was made and further tests when possible. In the 500 cases only meager histories and routine examinations were obtained. Only twenty returned for reexamination following illness or some other form of leave of absence but these consistently showed the total absence of symptoms and gradual increase in tension. The absence of any "follow-up" in the majority of these cases lowers the value of the information, but the author believes that the presence of this factor in so many otherwise normal persons opens a field for conjecture and investigation.

New Orleans Medical and Surgical Journal

92: 61-112 (Aug.) 1939

- Unification of Medical Profession for Protection of the Public. L. J. Menville, New Orleans.—p. 61.
Present Concept of Cancer. J. T. Nix, New Orleans.—p. 65.
Metrazol Therapy in Psychotic Excitements. E. N. Carmouche, S. J. Phillips, Pincville, La., and D. H. Duncan, Shreveport, La.—p. 67.
Pneumococcal Pneumonia: Treatment with Type Specific Serum. C. D. Head Jr., New Orleans.—p. 73.
Theophylline Ethylenediamine (Aminophyllin) in Bronchial Asthma. B. G. Efron and P. Everett, New Orleans.—p. 77.
Methods Used in Induction of Labor. M. B. Pearce, Alexandria, La.—p. 79.
Undulant Fever: A Problem in Every Physician's Practice. W. H. Browning and J. S. Shavin, Shreveport, La.—p. 81.
Trigeminal Neuralgia. D. H. Echols, New Orleans.—p. 87.
Fractures of Malar Bone and Zygoma with Eye, Ear, Nose and Throat Complications. M. F. Meyer, New Orleans.—p. 90.
Aneurysm of Splenic Artery: Report of Case, with Special Reference to Certain Aids in Diagnosis. J. G. Pasternack and J. R. Shaw, New Orleans.—p. 94.

New York State Journal of Medicine, New York

39: 1525-1636 (Aug. 15) 1939

- Compensation for Eye Injuries: Its Past, Present and Future in New York State. A. C. Snell, Rochester.—p. 1531.
Rationale and Results of Maggot Therapy in Chronic Osteomyelitis. J. Buchman, New York.—p. 1540.
Acute Osteomyelitis. C. T. Harris, Rochester.—p. 1554.
Sulfapyridine in Treatment of Pneumonia: Report of 100 Cases. B. R. Allison, Hewlett.—p. 1558.
Newer Concepts of Bacillary Dysentery and Other Types of Intestinal Infection. J. Felsen, New York.—p. 1562.
Treatment of Varicose Veins and Varicose Ulcers: Experiences in 800 Cases. P. H. Rakov, Syracuse.—p. 1569.
Diarrheal Diseases: Report of Findings in 220 Consecutive Cases. W. Z. Fradkin, Brooklyn.—p. 1578.
Microsedimeter for Erythrocyte Sedimentation Test. H. Vollmer, New York.—p. 1583.
Renal Sympathectomy. J. S. Ritter and L. A. Shifrin, New York.—p. 1587.
Pilonidal Sinus and Its Treatment. I. Silverman, Brooklyn.—p. 1598.
Carcinoma of Bladder: Open Surgical Treatment. A. Harris, Brooklyn.—p. 1603.
Meningococcal Meningitis: Treatment of Case with Meningococcus Antitoxin. A. M. Tunick and A. A. Goldbloom, New York.—p. 1608.
Skin Reactions: VIII. Treatment of Hay Fever Seasonally by Electrophoresis of Active Constituent of Ragweed Extract: Preliminary Report. H. A. Abramson, New York.—p. 1611.
Jejunal Carcinoma: Report of Case. W. W. Jetter, Taunton, Mass.—p. 1614.
Coronary Occlusion in Young Adults: Review of Literature with Report of Case Aged 26. A. S. Ferguson, Newburgh, and J. R. Lockwood, Highland.—p. 1618.
Tonsillectomy in the Diabetic Child. A. H. Terry Jr., New York.—p. 1622.

Sulfapyridine for Pneumonia.—Since January 1939, Allison points out, 100 cases of pneumonia have been treated at the Nassau Hospital. Every patient with pneumonia admitted to the hospital was given sulfapyridine whether or not a pneumococcus was found in the sputum. If a patient was desperately sick on admission or did not respond promptly to the drug, serum also was given. The sputum was examined at least once in ninety-seven cases. A pneumococcus was found in seventy, and twenty-seven were negative for pneumococci. The types of pneumococci found were I, III to VIII, XI, XIV to XXIII, XXVIII and XXIX. Blood counts and urinalyses were done in all cases. The severity of illness of

these 100 patients was comparable to any similar series of patients with pneumonia admitted to the hospital during recent years. Sixty-one patients were admitted before the fourth day of the disease, twenty on the fourth day and nineteen after the fourth day. Forty-two cases occurred in children less than 10 years of age, nine of these occurring during the first year. The average number of days spent in the hospital was 13.8. Four of the 100 patients died, one infant and three adults. Six of the seventy blood cultures performed were positive; three were type I, two type VIII and one was unidentified. One of the patients with type I pneumococci, with a very heavy growth, was addicted to alcohol, had hypertension and made a dramatic recovery. One, with a heavy growth, died in twenty-four hours in spite of 400,000 units of serum and sulfapyridine. The third patient recovered after 300,000 units of serum and 46 Gm. of the drug. Both patients with type III pneumococcus recovered. The unidentified case also resulted in recovery. An initial dose of 2 Gm. of the drug followed by 1 Gm. every four hours was given in most of the adult cases. Of the fifty-eight adults, twenty-eight received a total of less than 15 Gm., fifteen received from 15 to 25 Gm., ten from 25 to 40 Gm. and five more than 40 Gm. The average total dosage was 19 Gm. The author's impression is that small doses, certainly much smaller than the 25 Gm. originally suggested, will prove sufficient in many cases. In children a daily dose of 0.2 Gm. per kilogram of body weight, reduced to 0.1 Gm. after the first twenty-four hours, is suggested. Children seem to tolerate the drug so well that in some cases much larger amounts were given. The average total dosage for children was 7 Gm. This total dosage was well tolerated by each of the nine infants. As a rule, the temperature in an interval of from twelve to thirty-six hours showed a marked drop and with it the pulse and respiratory rate. The general appearance and sense of well being of the patient showed a corresponding improvement. The temperature response seems to be a good index of the extent of improvement. Twenty-two of the twenty-seven patients in whose sputums no pneumococcus was found showed a prompt response to treatment. It is possible that further sputum examinations would have revealed pneumococci; otherwise such a high percentage of prompt responses in nonpneumococcal pneumonias would not be expected. There were no serious toxic signs in any of the cases. The mortality rate at the Nassau Hospital for all pneumonias during the last four years was 19 per cent in 1935, 20.9 in 1936, 18.1 in 1937 and 11 per cent in 1938.

Northwest Medicine, Seattle

38: 273-316 (Aug.) 1939.

- Personality Traits and Mental Hygiene. A. C. Ivy, Chicago.—p. 275.
Hodgkin's Disease with Herpes Zoster and Varicella. M. B. Marcellus, Bayocan, Ore.—p. 279.
Etiology of Herpes Zoster and Varicella. R. T. Henson, Coeur d'Alene, Idaho.—p. 283.
Gastrojejunocolic Fistula. C. R. Mowery, Spokane, Wash.—p. 283.
Spasmus Nutans. J. M. Cronin, Klamath Falls, Ore.—p. 286.
Blood Examinations in Lead Poisoning. T. E. P. Gocher, San Rafael, Calif.—p. 289.
Venereal Disease Control in Oregon. S. D. Allison, Portland, Ore.—p. 291.

Hodgkin's Disease with Herpes Zoster and Varicella.

—Marcellus reports a case with the simultaneous coincidence of Hodgkin's disease, herpes zoster and varicella. The vesicular eruption of varicella had a localizing effect on the herpes zoster. Unlike some of the others formerly reported, this patient showed the clinical characteristics of varicella with symmetrical lesions which had thin and easily ruptured vesicles, containing clear fluid at first which later became pustular; the eruption spread rapidly and formed typical crusts; the mucous membranes were involved and from the history there might have been exposure to varicella, during leave from the hospital the first day of which was just fourteen days prior to the vesicular eruption, and the characteristic fever immediately preceding an almost typical eruption strongly suggested varicella or variola, but it is believed that, as he had been successfully vaccinated, the latter may be ruled out. This case undoubtedly represents the simultaneous existence of slowly progressive Hodgkin's disease, proved beyond a doubt by several biopsies at different laboratories all of which agreed, and

herpes zoster closely followed by varicella, with no recurrences of either cutaneous eruption after the patient was discharged from the hospital following the recovery from the cutaneous lesions.

Psychoanalytic Quarterly, Albany, N. Y.

8: 279-408 (July) 1939

- Discovery of Edipus Complex: Episodes from Marcel Proust. G. Zilboorg, New York.—p. 279.
Problems of Psychoanalytic Technique. O. Fenichel, Los Angeles.—p. 303.
Sublimation. Frances Deri, Los Angeles.—p. 325.
Significance of Theatrical Performance. R. Sterba, Detroit.—p. 335.
Experimental Demonstrations of Psychopathology of Everyday Life. M. H. Erickson, Eloise, Mich.—p. 338.
Associative Anamnesis. F. Deutsch, Boston.—p. 354.

Public Health Reports, Washington, D. C.

54: 1467-1508 (Aug. 11) 1939

- Plague in the Western Part of the United States: Infection in Rodents, Experimental Transmission by Fleas and Inoculation Tests for Infection. C. R. Eskey and V. H. Haas.—p. 1467.
Observations on Infectious Agent from *Amblyomma Maculatum*. R. R. Parker, G. M. Kohls, G. W. Cox and G. E. Davis.—p. 1482.

Radiology, Syracuse, N. Y.

33: 131-260 (Aug.) 1939

- Röntgen Kymographic Study of Alterations in Pathologic Heart During Valsalva and Müller Tests. A. C. Morelli, Montevideo, Uruguay; translation by M. Wright.—p. 131.
Rational Radiotherapy. G. W. Grier, Pittsburgh.—p. 148.
Cystic Disease of Lung. L. R. Sante, St. Louis.—p. 152.
Treatment of Polycythemia Vera with Roentgen Ray. I. I. Kaplan, New York.—p. 166.
Intestinal Movements in Ileocecal Region. A. E. Barclay, Oxford, England.—p. 170.
Radiology in Teaching of Anatomy. I. C. C. Tchaperoff, London, England.—p. 177.
Megaduodenum and Duodenal Obstruction: Criteria for Diagnosis. M. Sturtevant, New York.—p. 185.
Reducing Toxic Period in Hyperthyroidism. S. C. Barrow, Shreveport, La.—p. 189.
Roentgen Ray Treatment of Skin Cancer. C. W. Perkins, Norwalk, Conn.—p. 191.
X-Ray Study of Lungs of Workmen in Asbestos Industry, Covering Period of Ten Years. A. W. George and R. D. Leonard, Boston.—p. 196.
Ulcer Niches with Stopper-Shaped Vascular Defect. Å. Åkerlund, Stockholm, Sweden.—p. 203.
Biology of Bone Metastases. J. Borak, Vienna, Austria; translation by F. J. Lust, New York.—p. 208.
Further Notes Concerning Traumatic Subdural Hematoma. S. W. Gross, New York.—p. 213.
Aneurysm of Pulmonary Artery. F. M. Groedel, New York.—p. 219.
Roentgen Diagnosis of Abdominal Effusions. R. A. Rendich, B. Ehrenpreis and T. Frattalone, Brooklyn.—p. 233.

Cystic Disease of Lung.—Sante refers to abnormal confined collections of fluid within the lung as cysts and to air-filled cavities as pneumatocoles. One of the most common types of lesion referred to as cystic disease is seen as multiple thin-walled pneumatocoles, clustering about the larger bronchial branches in the hilar regions and adjacent areas, giving rise to the condition referred to as cystic bronchiectasis. When the cavities are small and their walls are thick the term honeycomb has been applied to their appearance. Fluid cysts and pneumatocoles of the lung arise as results of definite derangement in the lung structure. These derangements can be either congenital from faulty embryologic development or acquired from infection and fibrosis. The factors which primarily influence the degree of inflation of such pneumatocoles, in which free bronchial connection is present, are the relationship of the resistance of their walls to the resistance of normal alveolar structure supplied by a bronchiole of equal size to the opening supplying the cavity. The pressure in the pneumatocole cannot exceed atmospheric pressure. On x-ray examination there should be no deviation of the mediastinum at any time. In instances in which a simple check-valve opening permits entrance of air on inspiration but checks it on expiration, the pneumatocole will enlarge in size until an equilibrium is established; the pressure within the pneumatocole cannot become greater than that of the atmosphere at maximal inspiration but may exceed this at expiration, also causing the mediastinum to be in normal position on maximal inspiration but displaced to the opposite side on expiration. Pneumatocoles which continue to expand showing higher than atmospheric pressure at all times during the respiratory cycle would seem to require

the addition of some unusual pumping force to account for their expansile character. Fluid cysts may result only when the defect involves a bronchial structure which still retains secretory power. Pneumatocoles arising from the alveolar structure as a result of emphysematous involvement should not be preceded by fluid cysts, since they are not lined by secretory epithelium.

Reducing Toxic Period in Hyperthyroidism.—For some years Barrow has believed that the dosage of x-rays given in the treatment of hyperthyroidism, even by those of wide experience, is insufficient for the best interests of the patient. As the mysteries and intricacies of the ductless gland system unfold, it is well to bear in mind the possibility that there may be other functions of the thyroid than those now recognized. Surgical removal of the thyroid or proper irradiation of the gland alone will restore the patient to normal. However, no organ of the body should be removed because of dysfunction or excess function when it is possible to correct its functioning processes. The depressant action of x-rays in all conditions characterized by hyperfunction or excess cell activity is recognized. The only argument which has been advanced against roentgen therapy for hyperthyroidism is the time usually consumed in bringing the patient to a nontoxic state. Small dosage at long intervals seems to be the practice generally followed. The object of the surgeon has been to remove with one stroke the source of toxicity, the thyroid gland. Why not, then, suppress this toxicity as abruptly by radiation? Following the use of comparatively large doses of x-rays in extremely toxic cases of hyperthyroidism, the author has never seen any ill effects. On the contrary, by the application of rather intensive dosage only good results have been seen, the most toxic cases becoming nontoxic in from four to ten weeks rather than in from six to nine months (the usual time required with small doses of x-rays). If the metabolic rate is high, plus 50 or more, the application of 750 roentgens weekly, the dose divided over three areas, right and left anterior lateral and posterior with a kilovoltage of about 130 and 3 mm. of aluminum filter is the minimal dosage indicated. This may be repeated from six to eight times at intervals of seven days, with no ill effect on the skin. The metabolic rate should be checked each week and the doses should be spaced at longer intervals or decreased as the metabolic rate falls. The metabolic rate should be reduced to zero before treatment is discontinued; otherwise an exacerbation will inevitably follow. The fear of myxedema following irradiation is hardly to be considered when radiation is applied intelligently. Intense radiation given over the thyroid area in cases in which the thyroid is normal has not shown any bad effects on the gland. Under circumstances in which it is difficult because of distance or other causes to give weekly applications, still more intensive dosage may be applied at intervals of fourteen days (200 kilovolts, 0.75 mm. of copper filtration, with 1,200 roentgens distributed over three areas). This technic may likewise be repeated with safety but will require as many applications, because the metabolic rate falls rapidly. In the treatment of all cases, foci of infection should be removed, iodine withheld and quinine used liberally, with of course, restrained activity as indicated. Two charts are presented indicating the conditions existing in two typical cases of hyperthyroidism, with the treatment given and the result obtained.

Texas State Journal of Medicine, Fort Worth

35: 259-324 (Aug.) 1939

- Use of Liver and Iron in Treatment of Anemia. R. L. Haden, Cleveland.—p. 266.
General Considerations of Toxemias of Pregnancy. H. J. Stander, New York.—p. 270.
Operation for Chronic Dislocation of Inferior Radio-Ulnar Articulation. J. L. Taylor, Houston.—p. 278.
Chronic Leg Ulcers: Discussion of Pathogenesis and Rationale of Treatment. R. S. Fillmore, Jacksboro.—p. 281.
Progress in Biliary Tract Surgery. C. A. Kunath, San Angelo.—p. 286.
Use of Electrocoagulation in Treatment of Tumors of Rectum. H. F. Hayes and H. B. Burr, Houston.—p. 292.
Sterility Treated by Uterotubal Insufflation with X-Ray Control. C. L. Martin, Dallas.—p. 295.
Artificial Pneumoperitoneum. B. O. Lewis, Galveston.—p. 300.
Some Aspects of Public Health Control of Syphilis. J. R. Heller Jr., New Orleans.—p. 305.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

12: 449-504 (Aug.) 1939

- Report on Skiagraphic Terminology in Pulmonary Disease. The Joint Tuberculosis Council.—p. 449.
Asymmetry of Skull in Relation to Subdural Collections of Fluid. J. Hardman.—p. 455.
Short-Distance Low-Voltage X-Ray Therapy. P. A. Flood and D. W. Smithers.—p. 462.
Effect of Gamma Radiation on Cells in Vivo: Part II. A. Glucksmann and F. G. Spear.—p. 486.
Radium Implant Reconstructor. II. M. Parker and W. J. Meredith.—p. 499.

British Medical Journal, London

2: 155-208 (July 22) 1939

- Pharmacologic Actions and Therapeutic Uses of Some Compounds Related to Adrenalin. J. A. Gunn.—p. 155.
*Electro-Encephalogram as Aid in Clinical Neurology. R. A. Krynauw.—p. 160.
Seasickness. R. J. Blackham.—p. 163.
Acute Phlegmonous Gastritis in Pregnancy. T. Barnett and D. P. Harris.—p. 167.
Cobalt as Factor in Control of Nutritional Anemia. H. H. Corner.—p. 169.

Electro-Encephalogram as Aid in Clinical Neurology.

—From experience to date in the examination of intracranial tumors, although the electro-encephalogram is surprisingly accurate in localization in most cases, Krynauw states that the additional help given by ventriculography should not be dispensed with when operation is contemplated. Information as to the depth of a neoplasm, its absolute size and its relation to the ventricles, basal ganglions and the like can be obtained at present only by adequate air studies; and such information is essential in planning the scope of an operation or deciding on the operability of a tumor. Electro-encephalography by itself is no short cut toward the establishment of the anatomic and pathologic diagnosis of intracranial lesions. Considerable interest is attached to the study of the epilepsies by this method. Nevertheless it is in the epileptic group that the greatest difficulty occurs in the evaluation of results. In many cases of the group known as "idiopathic grand mal" there is constant electrical flux, sometimes generalized and arising from the whole cortex but often arising from one or more foci. In some cases the changes resemble closely those found in association with expanding lesions. In some cases, too, there is a tendency toward a frequent shift of the focus. These remarks apply only to those cases of epilepsy in which there is a "resting focus" of electrical flux; that is, changes which can be detected between the actual fits. These changes are constant in that individual and do not bear any time relation to the actual fits. There is, however, evidence that before a fit, perhaps for hours, a day or even longer, there is an accession in the electrical changes. On records taken at such times, bursts of waves of increased amplitude and varying rate appear not at all unlike the "larval" attacks of petit mal described by Lennox and his associates. There are many cases that clinically appear to be idiopathic grand mal in which the author has not been able to detect any abnormality of the electrical rhythm. Why this should be so is difficult to decide, but from his experience there seems to be some relation between the resting focus and cortical degeneration. In cases in which numerous minor seizures occur there is an almost constant electrical flux with occasional sudden bursts of increased activity which have been described as larval or subclinical seizures, and then again the actual petit mal attacks with even greater alterations of amplitude. The pyknolepsies are said to fall into this group. It has been claimed that in the so-called traumatic epilepsies there is never any evidence of a resting focus of electrical abnormality. The author's experience supports this, for many cases with fits after a head injury have yielded negative observations on electro-encephalography. However, he has records of several cases of gross localized cortical damage in which alterations of potential were observed, similar to those found with expanding intracranial lesions. In such cases he has assumed an underlying area of gliosis. In patients in whom the onset of fits occurs in later life after the age of 40, the possibility of an expanding lesion should be ruled out, and air studies are often called for.

In the author's series the electro-encephalogram has always been normal when the encephalogram was normal, but further work is necessary before the reliability of the method can be assessed accurately.

Irish Journal of Medical Science, Dublin

No. 163: 289-336 (July) 1939

- Combating Tuberculosis in a Swedish City. A. Wallgren.—p. 289.
Method and Significance of Blood Alcohol Estimations. J. McGrath.—p. 304.
Sarcoma of Prostate in Children. I. Fraser.—p. 330.

Lancet, London

2: 171-236 (July 22) 1939

- Mechanism of Diabetes Mellitus. H. P. Himsworth.—p. 171.
*Ureteric Catheterization in Pyelitis of Pregnancy. V. W. Dix and H. Evans.—p. 176.
Vertebral Fractures Complicating Convulsion Therapy. H. A. Palmer.—p. 181.
Importance of Bronchoscopy in Unresolved Pneumonia. J. E. G. McGibbon, E. T. Baker-Bates and J. H. Mather.—p. 183.
Surgical Conservation of Hearing. A. Tumarkin.—p. 189.
Angina in Pernicious Anemia with Electrocardiographic Changes and Abdominal Aneurysm. S. Vatcher.—p. 192.
Histiocytic Medullary Reticulosis. R. B. Scott and A. H. T. Robb-Smith.—p. 194.

Ureteral Catheterization in Pyelitis of Pregnancy.—

During a period of four years Dix and Evans state that eighty-four cases of pyelitis of pregnancy were admitted to the London Hospital, and of these only seven required ureteral drainage: five because of failure to respond to alkali therapy and two because of excessive vomiting, making the administration of alkali impossible. Nine ureteral catheterizations were carried out. In one instance the second catheterization was necessary because the first catheter was removed by a nurse when the patient returned to the ward, and in another the second catheterization was performed three and a half months after the first during a recurrence of pyelitis. In no case was it necessary to use an anesthetic. Catheterization of the ureter during pregnancy is not easy and should be carried out only by the expert. If it should ever be necessary for the relatively inexpert to attempt catheterization in the later stages of pregnancy, an anesthetic should be given to minimize the difficulties. When the ureteral orifice has been identified and the catheterization has begun there should be no difficulty, and the fact that the catheter has reached the renal pelvis will be at once evident from the rapid flow of urine, which is considerably in excess of that from a ureteral catheter of the same size passed into a normal pelvis. In cases in which there has been a complete block at the pelviureteral junction the flow may be rapid. It is advisable to pass as large a catheter as possible. The sizes used have been 10 and 12. Great care must be taken, in withdrawing the cystoscope, to avoid displacement of the catheter. The catheter is attached to the leg and the urine is allowed to drain into a bottle. The catheter was usually left in place for three or four days. However, equally good results might be obtained if the catheter remained in place for only one or two days, although there would perhaps be a slightly increased risk of recurrence. It should be removed at once if urine ceases to run freely and gentle syringing fails to reestablish the flow. The effect of catheterization and drainage alone on the seven patients was so good that no additional treatment was needed except the continued administration of citrate. Premature induction of labor should rarely, if ever, be necessary, even in severe pyelitis of pregnancy. One case of postpregnancy pyelitis was also treated successfully by catheterization.

Medical Journal of Australia, Sydney

2: 155-192 (July 29) 1939

- Health of Fetus, or True National Insurance: Review of Certain Aspects of Fetal Environment. R. Fowler.—p. 155.
Review of Experience with Cyclopropane. G. Troup.—p. 164.
Anesthesia for Specialist Nose and Throat Surgeries. R. H. Orton.—p. 168.
Anesthesia in Acute Intestinal Obstruction. G. Brown.—p. 170.

South African Medical Journal, Cape Town

13: 507-534 (July 22) 1939

- Diagnosis and Treatment of Common Anemias. J. F. Brock.—p. 509.
Bladder Neck Urinary Obstruction. S. McMahon.—p. 517.
Surgical Treatment of Cholecystitis and Gallstones. N. Garber.—p. 520.
Tuberculosis of Temporal Bone in Infants and Young Children. H. Levit.—p. 523.

Journal Belge d'Urologie, Brussels

12: 197-276 (Aug.) 1939. Partial Index

- *Amicrobic Pyuria. J. A. Weytlandt.—p. 197.
Cicatrizations of Tuberculous Renal Lesions Revealed by Retrograde Ureteropyelography. M. Chevassu.—p. 202.
Case of Crossed Ectopic Kidney: Remarks on the Surgical Treatment. R. Gouverneur.—p. 211.
Two Cases of Acquired Vesical Atresia. F. H. de Beaufond.—p. 215.

Amicrobic Pyuria.—Weytlandt directs attention to cases of cystitis and pyelocystitis in which the urine is free from microorganisms. He thinks that in cases of this type it is necessary to consider first the possibility of renal tuberculosis even in the absence of acid-resistant bacilli. Another factor that must be considered is that during infections with colon bacilli there are periods in which no organisms are found in the urine even if cultures are made. The cases mentioned so far are false cases of amicrobic pyuria, but there are also cases of true amicrobic pyuria. In this connection the author mentions first cases of leukocyturia that are caused by mechanical or chemical irritation. Then there is a group of pyurias in which all cultures, including those for tubercle bacilli, remain sterile and in which even inoculations into guinea pigs produce negative results. The author says that it was Söderlund who in 1922 first called attention to this type of pyuria, which can be considered as a separate disease entity. The number of cases which have been reported since then is small, but this amicrobic pyuria is nevertheless of practical importance. Those who know it will doubtless have occasion to diagnose it. Moreover, this disorder, which formerly was extremely chronic and annoying is now curable, Wildbolz having discovered that it yields promptly to treatment with neoarsphenamine. In view of the fact that this form of amicrobic pyuria was first described by Söderlund and was first successfully treated by Wildbolz, the author suggests that it be designated Söderlund-Wildbolz disease. The etiology of the abacterial pyuria is still unknown, but in view of the curative effect of neoarsphenamine it is suggested that an infectious process is involved but that the causal agent is not necessarily a spirochete. The author describes the history of the case of amicrobic pyuria which he himself observed. The disorder began with hematuria, which was followed by cystitis. The urine contained large numbers of leukocytes but no microorganisms. Syphilis could be ruled out on the basis of the negative outcome of several serologic tests. When treatment with methenamine, phenyl salicylate and sulfanilamide had failed, the author resorted to intravenous injection of 150 mg. of neoarsphenamine. The first dose having produced considerable improvement, the patient was given two additional injections of 300 and 450 mg., respectively, at intervals of five and six days. The author thinks that two injections will suffice in most cases.

Presse Médicale, Paris

47: 1221-1228 (Aug. 9) 1939

- *Condition of Adnexa in Uterine Fibromyomas and Their Surgical Consequences. A. Chalié.—p. 1221.

Adnexa in Uterine Fibromyomas.—Chalié cites prognostic and physiologic considerations which indicate that operative treatment is advisable for the majority of patients with uterine fibromatosis, but he also stresses that the idea of conservation should be foremost in the mind of the surgeon, since the majority of women who require treatment for uterine fibromatosis are of the age group between 28 and 50; that is, they are women who are in the period of genital activity, and the majority still menstruate. As regards the problem of conservation, attention must be given particularly to the uterine adnexa, and the first question which presents itself is the anatomic condition of the adnexa in patients with uterine fibromyoma—in how many cases of uterine fibromatosis the adnexa are diseased. In order to throw light on this problem, the author carefully inspected the adnexa of 212 patients who received surgical treatment for uterine fibromas. He found the adnexa diseased in 161 of the 212 cases, more than three fourths. Most frequent were the purely ovarian lesions, which were observed in 104 of the 212 patients. Purely tubal lesions were comparatively rare, existing in eleven of the women. Mixed tubo-ovarian lesions were detected in forty-five cases. The author discusses to what extent it was possible to employ conserving methods in the surgical

treatment of these 212 patients. As regards the uterus, conserving operations could be employed in only twenty-four of the cases. These include six supra-isthmic hysterectomies, three hysterectomies of the fundus and fifteen myomectomies. In the other 188 cases the uterus had to be mutilated: total hysterectomy in thirty-eight and supravaginal hysterectomy in the other 150. Conservation of one or both of the adnexa was possible in ninety-eight, nearly 50 per cent of the cases. From this the author draws the conclusion that in spite of the frequency and severity of the adnexal lesions associated with uterine fibroma it is possible to preserve all or part of the ovarian apparatus in nearly 50 per cent of the cases.

Revue Neurologique, Paris

72: 1-136 (July) 1939

- *Basophil Adenoma of Hypophysis. A. Austregesilo, I. Costa Rodriguez and A. R. de Mello.—p. 1.
Intradural Fibrolipoma of Medulla. J. Jabotinski.—p. 15.
Oligodendroblastoma Involving Corpus Callosum: Consideration of Syndrome of Corpus Callosum. O. Sager and I. Bazgan.—p. 32.

Basophil Adenoma of Hypophysis.—Austregesilo and his associates studied the clinical, endocrine and roentgenologic aspects of a case of Cushing's disease in which the diagnosis could be confirmed by anatomopathologic examination. They give a detailed description of the history of the patient, a woman aged 44. Since 1914, when she had entered a psychiatric hospital for the first time, she had become extremely obese and hairy. In 1937 she presented severe obesity, hirsutism, virilization and anomalies of the menstrual cycle. Her face was round and moon shaped. Her organic resistance was reduced and she was easily fatigued. Her mentality was oligophrenic. Roentgenography of the sella turcica showed normal outlines. After describing the results of the humoral examinations, the authors show that these, like the clinical syndrome, indicate basophil hypophysial hyperhormonism with involvement of the other endocrine glands. The necropsy disclosed in the lateral portion of the prehypophysis an adenomatous formation, the size of a small pea, which at some points was separated from the glandular parenchyma by a thin capsule, whereas at other points there was no separation. The cells of the adenoma showed basophil granulation. The authors point out that the patient does not present the complete symptomatology of Cushing's disease, but they also show the multiple variations to which the clinical aspects are subject as a result of the pluriendocrine-metabolic deviation, according to whether there is a stimulating or an inhibiting preponderance of certain groups of cells of hypophysial secretion. They also direct attention to the relations between the hypophysis and the diencephalon. They think that the incomplete clinical forms of Cushing's disease are the most frequent, but because of the difference in symptomatology the clinical diagnosis of these forms presents difficulties.

Schweizerische medizinische Wochenschrift, Basel

69: 757-780 (Aug. 26) 1939

- The Labyrinth Does Not Represent the Organ of Equilibrium in Human Subjects. S. Erben.—p. 757.
Aspects of Bronchial Carcinoma. M. Dressler and A. Weigl.—p. 763.
New Model of Haab's Magnet. O. Haab and A. Schnetzler.—p. 767.
*Panic: Nature, Causes and Treatment. E. Bircher.—p. 768.
Alcoholism in Medical Clinic of Geneva During the Years from 1933 to 1936. M. Roch.—p. 772.

Panic: Nature, Causes and Treatment.—Bircher points out that during catastrophes treatment of the psychic injuries is as important and as much the duty of the physicians as is that of the physical injuries, and so he directs attention to the problem of panics which occur not only during wars but also in the course of earthquakes, mine accidents, fires in theaters, shipwrecks, explosions, devastations caused by meteorologic catastrophes, volcanic eruptions, famines, epidemic diseases and so on. Panic is a fear neurosis which develops in a small or large number of persons under the influence of great fear brought on by a catastrophe. This emotion may result in a sudden impairment of the consciousness and distraction, which leads to senseless excitement or, more rarely, to stuporous inhibition. The thin upper layer of consciousness is destroyed by the unexpected catastrophe and the strong instincts of the subconsciousness come suddenly to the surface and become dominant. The most important of these instincts is that of self

preservation. If this instinct becomes manifest in a mass, the phenomenon of mass fear results, which may degenerate into wild, uncontrolled flight. At the onset not all the members of the group are necessarily in the grip of this fear. It is enough that some, usually those having a psychopathic constitution, the unstable, succumb to the threat and in a mysterious, epidemic suggestion, everybody, even the strongest, is carried along. The author further discusses various types of panic, military, economic and so on, and points out that panics are observed also among animals. He thinks that the attitude toward life plays a part in the development of panics; that Asiatics and Mohammedans, whose attitude is more fatalistic, are less likely to be influenced by catastrophes than are Europeans, for instance. Some peoples seem to be more predisposed to panics than are others, but none are entirely immune to them. The degree of reactivity may differ, but culture or civilization does not have much effect in this respect, for panic is an atavism toward the primitive, perhaps even to the animal. The greater the discipline among a people, the lesser is the danger of panic. Declining and weakened peoples are more subject to panic than are others. In the therapy of panics, personalities with self possession, resolute determination and clear vision are most important, for they alone will know how to overcome the panic by the power of suggestion. Psychologic education of the masses and strengthening of the authority are important in counteracting the tendency toward panics. Discipline which comes from within and which is based on conviction or a great idea is stronger than that which is imposed from the outside.

Zeitschrift für klinische Medizin, Berlin

136: 439-576 (July 27) 1939. Partial Index

- Indication for Blood Transfusion in Internal Medicine and Its Therapeutic Effect. H. Toussaint.—p. 439.
Effects of Tobacco on Teeth. L. H. Strauss and J. Föckeler.—p. 468.
Hereditary Biology of Pernicious Anemia. O. Kaufmann and K. Thiesen.—p. 474.
Dependence of Surface Tension on Hydrogen Ion Concentration. C. J. Keller and O. Künzel.—p. 507.
Structural Changes in Granulocytes After Administration of Aminopyrine. H. Bernigau.—p. 517.
Changes of Red Blood Picture After Gastric Resection. Magdalene Dreher.—p. 525.
Significance of Typical and Atypical Bundle-Branch Block for Estimation of Working Capacity. L. H. Strauss and F. Bolt.—p. 560.

Heredity in Pernicious Anemia.—Citing reports from the literature, Kaufmann and Thiesen show that it cannot be doubted that hereditary factors play a part in the pathogenesis of pernicious anemia. In order to obtain more information about this problem, they made studies on the relatives of patients with pernicious anemia. Their material comprises forty-eight family groups, in which 168 persons were examined. Specimens of gastric juice of an additional twenty-three relatives were examined, and anamnestic data of a number of other relatives were obtained by means of questionnaires. Summarizing the results obtained in these studies, the authors say that they detected the multiple occurrence of pernicious anemia in eight of the forty-eight families, that is in 16.7 per cent. Once it occurred in uniovular twins, once in three sisters, twice in mother and son, twice in brothers, once in brother and sister and once in cousins. That they detected multiple familial occurrence of pernicious anemia more frequently than did other investigators is ascribed by the authors to the fact that most of their patients with pernicious anemia were of an advanced age so that an existing predisposition in siblings and other relatives had time to become manifest. The multiple familial occurrence of pernicious anemia is so considerable that accident cannot explain it and heredity must be assumed. The authors also observed the concurrence in the same families of pernicious anemia and essential hypochromic anemia. They say that the familial concurrence of these two forms of anemia has been reported so frequently that a common hereditary factor must be assumed. A pathogenic connection of the two disorders is indicated also by the repeated observation of a transition of essential hypochromic anemia into pernicious anemia. The multiple appearance in their material of anacidity, of subacidity, of hematic symptoms resembling those of pernicious anemia, of soreness of the tongue and of atrophy of the lingual mucosa is regarded by the authors as further evidence of the transmission

of hereditary factors of pernicious anemia. They gained the impression that the increased incidence of anacidity or subacidity in the families of patients with pernicious anemia is of especial significance because its hereditary transmission apparently is dominant. Their statement that the results of their investigation indicate hereditary origin in about half of their cases does not signify that in the other cases signs of hereditary transmission were entirely absent; cases in which there were an increased color index and hypersegmentation but normal gastric secretion were not grouped with those in which hereditary origin was certain. They consider it possible that heredity plays a part in all cases of pernicious anemia. On the other hand, they think that there may be purely exogenic, nonhereditary cases of pernicious anemia.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 3573-3684 (July 15) 1939. Partial Index

- Nerve Injuries in Fractures of Lower End of Humerus. L. D. Eerland.—p. 3574.
Determination of Hormones in Urine of Patients with Tumors of Testes, Especially with Chorionepithelioma. E. Dingemans and E. Laqueur.—p. 3582.
Leptospirosis in Atjeh. G. F. Kotter.—p. 3590.
Action of Subcutaneously Administered Carbon Dioxide Gas in Angiospastic Disorders. J. C. Mom.—p. 3595.
Suppurating Pulmonary Cyst Treated by Lobectomy: Case. H. W. Hoefnagels.—p. 3598.

Subcutaneous Carbon Dioxide in Angiospastic Disorders.—Mom points out that carbon dioxide stimulates the respiration as proved by the administration of oxygen-carbon dioxide mixture in cases of asphyxia. He discusses particularly the stimulating effect of the subcutaneously administered gas on the terminations of the vagosympathetic nervous system in the skin. Having observed that Romeuf employed this treatment with success in vasomotor disturbances, such as intermittent claudication, acrodynia, acrocyanosis and Bürger's disease, the author also decided to try it. He injects each time from 40 to 50 cc. of the gas under the skin of the arm or leg. If necessary, from 300 to 400 cc. can be injected in one session at different sites. The use of a manometer is desirable so that the pressure of 2 meters of water (about 150 mm. of mercury) is not exceeded. A patient who is resting requires from four to sixteen hours for resorption, an ambulatory patient several hours. The vasodilator effect of this treatment produces a better blood perfusion of the treated area.

83: 3769-3872 (July 29) 1939. Partial Index

- Psittacosis in Amsterdam Detected with Aid of Complement Fixation Reaction. A. Charlotte Ruys, A. L. Noordam and H. Vervoort.—p. 3776.
Effective Insulin Suppository. B. Brahn and T. Langner.—p. 3784.
Ambulatory Feeding with Jejunal Tube in Patients with Gastric and Duodenal Ulcers. R. A. Hoekstra.—p. 3791.
Treatment of Adiposity. J. Groen.—p. 3799.

Effective Insulin Suppository.—Brahn and Langner say that rectal administration of insulin has not been possible heretofore because insulin is destroyed by tryptic ferments. The authors decided to find a way to protect the rectally administered insulin against destruction (1) by adding acid in order to protect it against tryptic digestion and (2) by adding substances that increase surface tension so as to increase the rapidity of absorption. In numerous experiments on animals and human subjects the authors demonstrated that suppositories consisting only of insulin and cocoa butter (theobroma oil) are ineffective in animals as well as in human subjects. However, by adding acid it was possible to make the insulin effective and protect it against tryptic influences. The authors experimented with hydrochloric acid and with several organic acids such as lactic acid, acetic acid, citric acid, tartaric acid and palmitic acid. They found most effective a mixture of lactic and palmitic acids. Because the latter acid has a melting point of 60 C., it must be mixed with cocoa butter in a ratio of 15:85, thus bringing the melting point to about 33 C. Further experiments proved that the addition of saponin increases the efficacy of insulin suppositories. Experimenting with various types of saponin, the authors found that saponaria saponin, although harmless in oral administration, is dangerous in rectal administration. Other saponins were found to be harmless, however. Following rectal application of the insulin suppositories prepared by the authors,

the effect on the blood sugar is rapid, the maximum being reached in from thirty to forty minutes. After that the action decreases rapidly. Increasing the insulin dosage not only intensifies the action but also prolongs its duration.

Acta Medica Scandinavica, Stockholm

100: 485-606 (July 1) 1939

- *Role of Hypophysis in Pathogenesis of Total Alopecia. E. Kylin and E. Dicker.—p. 485.
Reticular Cells in Human Bone Marrow and Genesis of Monocytes. N. G. Nordenson.—p. 507.
Effect of Ingestion of Food on Plasma Proteins. J. B. Rennie.—p. 545.
Determination of Urine Fluorescence and Its Diagnostic Value, Especially in Carcinomas. F. I. Simon.—p. 553.
Carbohydrates in Diabetes Therapy With or Without Insulin. M. Lauritzen.—p. 559.
Angina Pectoris and Pressoreceptor Regulation. S. Wassermann and H. Weber.—p. 589.

Hypophysial Deficiency in Alopecia.—Kylin and Dicker report the clinical analysis of alopecia in twenty-nine persons (thirteen male and sixteen female) ranging in age between 5 and 61 years. A hereditary tendency was established for nine of the fifteen patients questioned with regard to familial occurrence. Two cases are given in detail and their mendelian significance pointed out. The disease, characterized by partial or total loss of hair at all areas of the body, did not affect the general health, left basal metabolism and blood pressure nearly always normal, occurred in six cases synchronously with the first menstruation, was accompanied by dental caries in fourteen, by brittleness of the nails and cutaneous modifications in fifteen, by constipation in half of the cases and by the appearance of anxiety, frequent headaches and constant chilliness and asthenia in 50 per cent at its first manifestation. With endocrine abnormality clearly in evidence, the authors were led to eliminate the direct pathogenesis of the sexual, adrenal, thyroid and parathyroid glands and to concentrate on the hypophysis as the causative factor. In this they were supported by the clinical evidence of a previous case incorporated in the paper. Therapy of the cases studied was twofold: (1) oral doses of hypophysial (anterior lobe) extract, which resulted in three complete cures, two partial cures and one negative issue; (2) grafting of two whole calf hypophyses, yielding two complete, four partial and two negative issues. (The previous patient was therapeutically managed both ways and cured after intervention of pregnancy and recidivation of alopecia.) The authors buttress the paucity of their cases and cures by reference to those of other therapists. They regard the amelioration or success obtained with other endocrine medicaments as confirmatory of their own, in view of the dominance of the hypophysis in the endocrine system. Among the conclusions of the authors the following may be mentioned: 1. Complete alopecia affects both sexes at all age levels, with the greatest incidence at the age of 23 to 25 years. 2. Total alopecia is heritable and obeys the mendelian laws. 3. The hypophysis plays an important part, though it cannot at present be determined whether the whole gland is involved or, only one of its parts and whether the gland affects pilositis directly or through other endocrine glands. 4. Grafting with whole calf hypophyses gives just as good results as oral or parenteral administration of hypophysial extract.

Nordisk Medicin, Helsingfors

3: 2051-2132 (July 8) 1939. Partial Index

Hospitalstidende

- *After-Examination of Patients with Uncomplicated Concussion of Brain, with Special Regard to Importance of Duration of Primary Rest in Bed. S. With.—p. 2057.
Icelandic Mud for Mud Packs. K. Hannesson.—p. 2072.

After-Examination in Concussion of Brain.—With asserts that brief individualized confinement to bed in uncomplicated concussion of the brain does not seem to give less favorable results either as to the time when the patients are able to resume their full work or as to the number of patients whose injuries are permanent than in corresponding groups treated with prolonged rest in bed, nor is the tendency to graver permanent injuries greater. He reviews the 394 cases (272 of mild, ninety-seven of moderate, twenty-five of grave concussion) treated in Sundby Hospital from 1924 to 1934 with individualized confinement to bed according to the duration of the symptoms. In 257 cases (65 per cent) the rest in bed was for less than

one week, in ninety-five (24 per cent) from one to two weeks, in thirty-one (8 per cent) from two to three weeks, in eight (2 per cent) from three to four weeks, in three (1 per cent) four weeks or more. He examined 328 patients (84 per cent) in their homes; 9.6 per cent could not be traced and 6.4 per cent had died, presumably not from accident. Permanent sequelae were found in 16.1 per cent (severe sequelae in six cases, moderate in eight, slight in seven, very slight in twenty-seven). The tendency to permanent injury, he says, increases with age. There was no demonstrable connection between the severity of the acute symptoms and the occurrence of permanent sequelae. Work was resumed within one month after discharge by 66 per cent of the patients and within from one to three months by 18 per cent. Less than 1 per cent were permanently disabled. Of 250 without permanent injury, 57 per cent were wholly free from symptoms one month after discharge, 73 per cent in all three months after discharge. In the remaining 27 per cent the general postcommotional symptoms disappeared more slowly.

Finska Läkaresällskapets Handlingar

- Significance of Focal Infection in Rheumatic Fever. M. Savolin.—p. 2077.
Experiences with Three Carcinoma Reactions. L. Furuhjelm.—p. 2082.
*Sedimentation Reaction in Ischialgias. H. Hortling.—p. 2086.

Sedimentation Reaction in Ischialgia.—Hortling made sedimentation tests three or four times, at intervals of one week, in 198 cases of grave ischialgia. An increased sedimentation reaction was established in fifty-two cases (26.3 per cent). In eighteen the increase was transient; in eleven of these the ischialgic symptoms had originated in connection with an infectious disorder; seven were considered cases of "genuine" ischialgia. In thirty-four cases there was a constantly increased sedimentation reaction, in sixteen explainable by simultaneous general disorder, in eighteen without demonstrable cause. In the cases connected with infections, unlike those in the other groups, there was no history of earlier ischialgic symptoms. Neuritic symptoms were present equally often in the cases with normal and those with increased sedimentation, and the sedimentation was not increased more often in the bilateral than in the unilateral cases. No connection was demonstrable between rise in temperature and increased sedimentation. Since from his results the author assumes that one fourth of the cases of ischialgia are, at least in part, combined with disorder of local or general nature which causes increased sedimentation, he considers the sedimentation reaction important because of the therapeutic possibilities.

Norsk Magazin for Lægevidenskapen

- Seven Cases of Weil's Disease. O. Svaar-Seljesæter.—p. 2089.
Course of Pulmonary Tuberculosis in Children: After-Examination of Patients Discharged from Reknes Children's Sanatorium from 1918 to 1932. T. J. Olsen.—p. 2095.
*Vertebral Fracture in Metrazol Shock Treatment. H. H. Dedichen.—p. 2101.
What Was Cause of Death? Epidural Hematoma or Hemorrhage in Brain Stem? O. Berner.—p. 2104.

Vertebral Fracture in Metrazol Shock.—Dedichen says that while fractures, usually of the neck of the femur, but also of the scapula and the pelvis, have been described in connection with metrazol shock, he has found but one instance reported of compression fracture in the vertebral column due to this treatment. In a short time he has observed such fractures, some grave, in six of eighty cases treated in his hospital, and similar fractures have been noted in other hospitals since attention has been called to them. These fractures do not occur in epileptic patients because the tonic stage is not so long and violent as in the metrazol attacks; the injury occurs during the tonic stage. The fractures resemble those seen in tetanus. The anterior part of the vertebra is almost always compressed, without injury to the spinal cord, and the posterior part remains intact. There is a slight gibbus. The fracture usually occurs between the third and the ninth thoracic vertebra, where kyphosis is most marked. The author now avoids these fractures by placing a firmly folded blanket under the region of the scapula, removing the pillow and having the patient stretched full length during the metrazol seizures, not allowing him to double himself up during the attacks. The most exposed anterior parts of the vertebra are thus kept apart and the stronger posterior parts receive most of the pressure.

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THE MANAGEMENT OF EXOPHTHALMIC GOITER IN A GENERAL HOSPITAL

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It is a well known fact that the surgical treatment of exophthalmic goiter in centers highly specialized in thyroid surgery may be carried out with a practically negligible mortality. In spite of many serious complications of this disease (hypertension, arteriosclerosis, diabetes and auricular fibrillation) the mortality is much lower than in chronic appendicitis or inguinal hernia when the latter diseases are associated with cardiac or other complications. This low mortality, however, is usually not maintained in general hospitals, where mortality figures are often from five to ten times higher than in special thyroid clinics. These clinics with a few thousand goiter operations a year have naturally developed an almost perfect organization both medically and surgically. It has been claimed that a similar organization cannot be maintained in a general hospital. Undoubtedly this statement is correct unless an organization within a general hospital is created for the proper management of this group of cases. That an efficient organization for the handling of thyroid cases can be created in any general hospital without great difficulty is proved by this report.

Most general hospitals have a number of surgical and a number of medical services. If the cases of thyroid disease are distributed or rotated among these different services, it is impossible to establish the organization necessary for the proper management of these cases. In other words, grouping the cases is the first step in an attempt to reduce the mortality and improve the results. Naturally, grouping requires continuous services. Rotating the services (two or three groups of men being in charge of the service during a calendar year) is incompatible with the development of a high standard of efficiency.

The present organization at this hospital was established in 1931. It was decided to concentrate the diseases of the thyroid gland in one medical (Oppenheimer) and one surgical (Lewisohn) service. Patients sent in by members of the other medical service (Baehr) were admitted to the Baehr service and were operated on by the same surgical unit. They are included in this survey. However, patients sent to the wards of the hospital by members of the other three surgical

groups were operated on in their respective services. They comprise a very small number and are not included in this statistical review.

ORGANIZATION AND MANAGEMENT

The patients were usually admitted to the medical wards of only one medical service, where they were seen by the medical members of the group. Whenever possible the patients were placed in a small back room containing only two or four beds and were not placed in the large general ward. They were encouraged to believe that a special interest was being taken in them by the group, and frequent opportunities were offered them for a detailed discussion of their real or fancied complaints. Any one who has handled these patients knows how important it is to be a "good listener." Since many of the patients were very apprehensive, as little as possible was done in the way of study until they had become accustomed to the hospital atmosphere. Psychotherapy of the most simple and practical sort was carried out, and the patients came to feel that they had a friend in the medical adviser. If patients were obviously in fear of surgery we usually answered their early questions regarding the necessity of surgical treatment by saying that the type of treatment would depend on the results of the "tests." As confidence developed, most of the patients were told of the advantage of surgery and they readily signed consent for operation. In some cases it was considered unwise to deal directly with the patient, and consent for the operation was obtained from a responsible relative and the operation done without the patient's knowledge, avertin with amylene hydrate being used as a basic anesthetic after the patient had been prepared by daily enemas of an inert substance for some time before the scheduled operation.

The patients were put to bed and kept there for at least several days. After that, lavatory privileges were allowed the less sick. All were given unlimited diets and encouraged to take extra nourishment between meals. No special effort was made to restrict protein or favor fat in the diet, and supplementary vitamins were rarely given. Relaxation packs were used only infrequently, but they sometimes seemed to help excited patients. The usual sedative was phenobarbital in doses of from 0.03 to 0.06 Gm. three times a day. If cutaneous rashes developed we usually substituted chloral hydrate and bromide for the barbiturate.

The occasional patient who remained very agitated, and particularly if diarrhea developed, was often helped by opiates, usually in the form of powdered opium in doses of 0.06 Gm. three or four times a day. We have no fear of opium medication in these patients for short periods, and it seems to exert a particularly beneficial effect in some instances.

A determination of the basal metabolic rate was done on admission and again one or two days later. If the rate was not excessively high, plus 50 per cent or less, the patients were usually given compound solution of iodine directly after preliminary studies had been made. It has been the rule of the group that the administration of iodine is really the first stage of the operation, and it is never begun until the patient has been seen by the surgeon and his consent for the administration of iodine obtained.

The more severely ill patients—with a basal metabolic rate over 50 per cent—and those who gave evidences of extremely acute disease, even if their basal metabolic rate was relatively low, were given a period of complete bed rest and sedation for such a period as was thought necessary to secure the maximum advantage of these aids before resorting to iodine. We think that the effect of the iodine is greatly enhanced if full advantage is taken of the tendency of the disease process to moderate under bed rest and sedation. Iodine was administered in the form of U. S. P. compound solution of iodine, and

patients who presented the picture of severe illness, and yet the basal rate was only moderately elevated. On the other hand, we have seen patients whose basal metabolic rate was plus 70 per cent or even plus 80 per cent and who did not impress us as being very ill. We have always regarded seriously those patients who fail to gain weight or whose basal metabolic rate remains high under rest and compound solution of iodine or in whom extremely agitated states, psychotic features, vomiting or diarrhea develops.

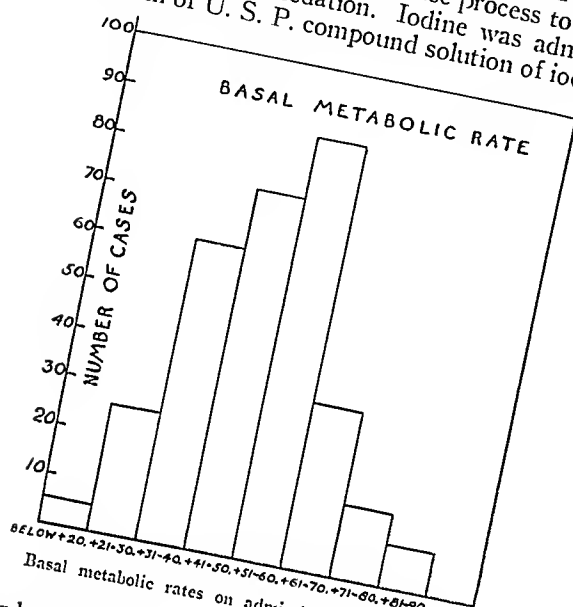
If an infection of the upper respiratory tract develops during the course of iodine medication, the operation is delayed until at least three days after all signs of the infection have cleared. The iodine is of course continued.

In the more severe cases one of the medical men usually arranged to be present at the operation to be able to consult with the surgeon as to the extent of the operation, and particularly whether the operation should be done in one or two stages. In most cases this decision was reached before the patient left the medical service. With regard to operation in two stages, our attitude has been that it affords a definite reduction in mortality and morbidity, and all patients about whom a serious doubt is entertained should be operated on in two stages. If there is a question as to the ability of the patient to stand a single stage operation, it is always better, we believe, to subject the patient to the inconvenience of two operations rather than to commit an irremediable error by subjecting the patient to more surgery than he can stand in a single stage. We have never seen any serious difficulty in the second stage, even in patients who were very acutely ill and who had had a stormy first stage.

In practically every case avertin with amylene hydrate was given by rectum as a basic anesthetic before the patient was taken to the operating room. We have had a large experience with avertin with amylene hydrate and recommend it highly for thyroid surgery. It spares the patient the tension and emotional excitement caused by the transfer to the operating room. In order to counteract any possible apprehension, the patient is given a hypodermic injection of a sterile salt solution and an inert enema on the two days preceding operation. Thus the patient reaches the operating room without the slightest emotional upset. The optimal day for the operation varies with the individual patient.

When the patient arrives in the operating room the pulse is counted. In a few cases when the pulse was over 150 beats a minute while the patient was under this anesthesia we have postponed the operation and have sent the patient back to the ward. We have never regretted this conservative attitude. However, decision as to the postponement should not be arrived at without bearing in mind that in many instances an accelerated pulse rate during basic anesthesia will drop 40 beats a minute when the patient is under complete anesthesia. The general anesthetic consisted of gas and oxygen and some ether. In a few instances in which there was a very severe heart lesion we have used ethylene gas or local anesthesia only.

An ever recurring acute problem in the management of this disease is what to do with the patient who has received iodine for a considerable period of time and yet fails to improve or even becomes worse under continued iodine administration. This is a very real and serious problem regarding which, unfortunately, there is no unanimity of opinion. This question also involves the problem of "iodine fastness" or "iodine resistance."



Basal metabolic rates on admission to the hospital.

two-thirds cc. was given each morning. There was no fixed period between the onset of iodine medication and the day of operation. We have operated as early as the fifth day and as late as six weeks after the beginning of iodine medication. The average period of preoperative iodine medication was eleven days. The patients were observed carefully during this period to avoid any complications that might delay surgery, particularly exposure to infections of the upper respiratory tract, to which their susceptibility is extreme and well known. A rapid and good effect from iodine was always considered a good prognostic sign, and failure to respond by a drop in the basal metabolic rate, subsidence of clinical activity or a gain in weight was always viewed with suspicion.

We shall consider at another point the management of this group who fail to respond favorably to iodine. During the period of iodine medication the basal metabolic rate was determined every third or fourth day and the operation performed as soon as the basal metabolic rate fell to plus 30 per cent or less. We wish to emphasize that although we consider the basal metabolic rate the best single indicator of the severity and progress of exophthalmic goiter, we are convinced that it is only one factor and that the disease is a great deal more than an elevated metabolic rate. We have seen

At the outset let us state our position clearly. In general the continuous, or even intermittent, administration of iodine to all patients with exophthalmic goiter over long periods of time is unwise and may even be dangerous. We feel that there is a clear difference in the reaction to iodine of a sufferer from exophthalmic goiter who has never received the element, if compared to one who has been under its effects for some time. One can almost predict a direct, immediate and significant amelioration of the course of the disease if the patient has never been given iodine. This is true whether the illness is of long or short duration, of moderate or severe intensity. Almost all these patients can be quickly improved to a point at which operation is safe. How different is the situation when one is faced by a patient who has had iodine for weeks or months. Experience has taught us how little more we can usually expect from the further administration of iodine. A failure to respond to the standard regimen plus iodine always leads one to suspect previous recent iodination, and this suspicion is often confirmed. We do not pretend to explain this phenomenon, although theories have been advanced (Marine), but the clinical fact is obvious that good responses are the rule in patients who have not had iodine, and are less frequent in iodinated subjects.

We are aware that there are competent observers who have long disagreed with this point of view. These men believe that iodine always consistently lowers the basal metabolic rate and the tempo of the disease and that those cases in which it apparently fails to do so are merely examples of spontaneous alteration in the severity of the disease which would be even more marked if iodine were not administered. As a result of this concept they favor the administration of iodine and still more iodine to patients failing to improve under its use, hoping that the disease will ultimately spontaneously regress and that this regression will be accelerated by the iodine. If this point of view is correct, there should be no essential difference in the reaction of iodinated and uniodinated patients. In fact, we should expect, according to this concept, failure to respond in a considerable number of cases in which the natural tendency of the disease was toward greater severity. This should be true particularly in hospitalized patients, for it is hardly likely that ward patients would regularly seek hospital care while their condition was improving. Yet a study of these cases reveals scarcely a single example of failure to respond favorably to iodine by untreated patients, and frequent failure to respond by iodinated patients. It seems very strange that the "spontaneous" course of the disease was almost always favorable in patients who had received no iodine and unfavorable in iodinated patients. It is our opinion that these alterations were not spontaneous but induced by the iodine and that the iodine was unable to induce the favorable change if it had already been given for a period of time.

It has been our practice to continue the use of iodine for a period of about ten to fourteen days in patients who have received it before admission. If their condition improves sufficiently to warrant operation, this is performed. If this period brings no improvement or if deterioration sets in, we discontinue all iodine for at least six weeks. This sometimes leads to a considerable aggravation of symptoms in the first or second week, and we give heavy sedative medication at that time. After a six weeks period we again use iodine as in our routine and we usually see a direct and favorable response and can proceed with surgery.

SURGICAL CONSIDERATIONS . .

This paper deals with the general management of exophthalmic goiter. For this reason we shall not discuss in detail the finer points of this surgical technic.

In 80 per cent of the cases the operation was finished in one stage; in 20 per cent a two stage operation was performed. In about a dozen cases the originally proposed second stage was not done, as the condition of the patient was very good when seen in the follow-up clinic. In very severe toxic cases the two stage method was definitely planned before the patient came to the operating room. In other cases we were guided in our decision as to the one stage or two stage procedure by the report of the anesthetist or the general behavior of the patient or by encountering exceptional technical difficulties (for instance, excessive bleeding) during the operation.

When in doubt we have employed the two stage procedure. It is impossible to fix definite rules with regard to the question which cases should be selected for the one stage and which for the two stage operation. While some very severe cases of exophthalmic goiter are definitely labeled suitable only for a two stage operation, others are on the borderline. It is perfectly reasonable to assume that we might have achieved just as good results if we had confined the two stage procedure to about 10 per cent of the cases instead to 20 per cent. However, it is very often impossible to predict which cases may present a postoperative crisis. Thus to be on the safe side and to prevent if possible this alarming and usually fatal complication, we have selected the two stage operation when in great doubt.

There are several different methods for thyroidectomy. Some surgeons split both ribbon muscles; others get a good view of the operative field by simple retraction of these muscles. In this series the right ribbon muscles were usually divided. After the right lobe had been resected following the ligation of the right polar vessels and division of the isthmus, it was easy to dislodge the left lobe from its bed and proceed to the resection of the left lobe without division of the left ribbon muscles. Minute and careful hemostasis is of the utmost importance. We have usually drained the operative field and were thus able to minimize the postoperative collection of serum in the wound.

The patient is moved from the operating room to the surgical wards; not into the large ward, however, but into an adjacent small room for one or two patients. Except in very mild cases special nurses (day and night) supervise the postoperative treatment during the first one to three days. Immediately after the operation and during the next few days the patient is visited at frequent intervals by the medical and surgical staffs. Staff visits should not, however, be paid indiscriminately in order to avoid interference with the patient's rest. The room is kept dark and quiet. No visitors are allowed during the first few days. The patient is given plenty of fluid. A tracheotomy set and a suction apparatus are at the bedside. The suction apparatus is used to prevent the collection of mucus in the pharynx. Catheterization is done every ten hours unless the patient voids spontaneously. Methenamine and acid sodium phosphate are given if catheterization is necessary. The patient receives 6 minims (0.4 cc.) of Magendie's solution every six hours. The nurse is instructed to watch for and report to the house surgeon any bleeding, cyanosis, dyspnea or swelling of the face or neck. The total intake of fluid and output of urine

are charted. A steam inhalation apparatus is kept at the bedside; two-thirds cc. of compound solution of iodine is given as soon as the patient reacts. If a patient has not reacted after five hours, the compound solution of iodine is given by rectum. The patient receives an additional 2 cc. of compound solution of iodine in 1 ounce of water by mouth during the first twelve hours. If this is vomited, another dose is introduced by rectum. After the second day the compound solution of iodine is reduced to two-thirds cc. a day. The temperature is taken immediately after arrival from the operating room and every four hours thereafter. A rise of temperature above 102 F. and a rise of pulse rate above 130 beats a minute must be reported immediately by the nurse.

If any alarming symptoms occur, both medical and surgical attendants are immediately notified by the house surgeon and respond for a consultation. We feel that this close cooperation between the two staffs has been of great help to the patient and has improved our results considerably.

Naturally, the operations were performed by a number of surgeons. In fact, we are presenting the combined results of thirteen different surgeons. The majority of the patients (247) were operated on by the attending surgeon or by one of his two associate surgeons; the rest (113 patients) were operated on by ten adjunct surgeons. In this hospital we have the group system in the surgical service. The junior surgeons rotate among these groups, staying one year in each group. Naturally their experience in this special thyroid group is limited. For this reason one of the senior members of the staff assisted them at the operation. No patients with exophthalmic goiter were turned over to the house surgeons for operation.

No polar ligations were performed in this series. Undoubtedly polar ligation in the group of very sick patients is not without risk. It seemed to us that polar ligation is of no benefit because of the abundant blood supply which still reaches the thyroid gland after one or even both upper thyroid poles have been ligated. If thyroidectomy is performed in two stages, the patients are informed before they leave the hospital for a two or three weeks stay in the country that they are to return for a second operation. They stay on compound solution of iodine during the interval between the two stages. They are readmitted to the hospital directly from the convalescent home. It is inadvisable to have them return to their homes before they reenter the hospital. In the vast majority of cases such a stay at home would mean emotional shock and hard work (cooking, looking after the children and the like). We have had very little difficulty in enforcing the two stage operation. Only a few patients absolutely refused the second stage. None of this small group presented a satisfactory result when reexamined in our follow-up clinic, demonstrating the importance of a complete operation in order to effect a cure.

NONSURGICAL CASES

During the period of this study we observed forty-seven patients with definite exophthalmic goiter who, for one reason or another, did not come to operation. Of these patients, nine died while in the medical service, and a brief analysis of these deaths will be given. We offered operation to eighteen others who refused and left the hospital at their own request. There were eight patients who presented such a mild form of the disease that we did not consider surgery to be indicated. All these made complete recoveries under medical treatment. Three patients became psychotic with suicidal

tendencies while in the hospital and had to be transferred to a psychiatric institution. The remaining nine cases, after study by the medical group, were considered unsuitable for surgery and were treated medically. In one case there was a difference of opinion between the medical consultants—one favored surgery and the other opposed it. In this instance the surgeon refused to operate. We refused to operate on another patient aged 69 whom we considered too poor a risk. She was given compound solution of iodine and roentgen therapy and was quite well, with a basal metabolic rate of minus 16 per cent, four years later.

Of the nine deaths among patients who were still in the medical service, six occurred within three weeks of admission. All these patients were desperately ill on admission to the hospital, and most of them were of the older age group who had serious cardiovascular complications. One patient died of an acute coronary artery thrombosis complicating diabetic ketosis. The remaining two patients died in typical thyroid storms following respiratory infections.

POSTOPERATIVE COURSE

Naturally in a series of more than 500 operations some postoperative accidents are apt to occur. A very small number of postoperative hemorrhages were seen. When such hemorrhage occurred, the patients were immediately taken back to the operating room where we had an opportunity to inspect the operative field carefully and stop the hemorrhage.

We did not observe any case of tetany of more than the lightest grade or of more than passing duration. As the symptoms never lasted more than from thirty-six to forty-six hours, we assumed that they were caused by a temporary injury to the parathyroids due to application of the clamp during the removal of the thyroid gland rather than to ablation of a part of one or more parathyroids.

MORTALITY

There were three deaths among 460 patients operated on for the first time for their thyroid disease. One of these deaths cannot be considered as an operative mortality. The patient had a subtotal thyroidectomy performed in two stages. The second stage was done after an interval of four weeks, during which the patient was kept in this hospital. She had reacted well after the second stage of the operation and had a comfortable night. The following day, while a special nurse left the room for a few minutes, the patient jumped out of the window and was killed immediately. The patient's husband told us later that she had played with the thought of suicide for many months. He had never taken her seriously and so had never mentioned the subject to us.

There was no mortality among the nontoxic group, in spite of the fact that some of these cases presented serious technical problems (large intrathoracic goiters and retrotracheal and retro-esophageal goiters). For instance, in one case of retrotracheal goiter the trachea was divided on its posterior aspect. The wide opening was immediately sutured and the patient made an uneventful recovery.

If we consider the operative deaths in the previously unoperated exophthalmic goiter group, we had a mortality of 0.5 per cent, if the case of suicide is not included.

There were two deaths among the twenty-six patients operated on for recurrent exophthalmic goiter. Both patients had had exophthalmic goiter for many years

and were extremely poor operative risks. In one case the operation (hemithyroidectomy) was performed under local anesthesia, as general anesthesia was definitely contraindicated because of the precarious general condition of the patient. In the other case a primary operation had been performed about twenty years previously at another hospital. In this case the heart was of the bovine type and the roentgenograms demonstrated the extreme risk of any operation in view of the serious cardiac changes. Yet the medical service felt that an attempt at relief by surgery should be made.

Among these twenty-six secondary cases operation had been performed in other hospitals in thirteen. Ten patients had had their first operation in this hospital many years before, and three had both their primary operation and their operation for recurrence during the period of this study.

FOLLOW-UP OBSERVATIONS

The close cooperation between the medical and surgical staffs in the management of goiter cases was continued in the follow-up observation of these patients. Members of both groups met twice a month in the thyroid follow-up clinic, where about thirty patients were seen at each session. The follow-up clinic worked in close cooperation with members of the thyroid clinic of the outpatient department (Dr. Benjamin Eliasoph and his staff, including a social service worker). The patients were seen by appointment. If necessary they were sent for further study to the thyroid clinic and referred back to the follow-up clinic with a detailed report and careful check up. Thus we were able to follow up 248 of our 360 patients and to classify them into three groups, according to the final results: group 1 (good), 225 cases; group 2 (fair), nineteen cases; group 3 (poor), four cases. The subsequent course of the remaining 112 patients could not be ascertained because contact with them had been lost.

Any grouping is subject to individual and personal impression. This factor, however, was minimized as the category to which a patient was assigned was decided by a number of physicians and not solely by the operating surgeon.

We have often been asked about our position toward x-ray treatment of exophthalmic goiter. We are opposed to this form of treatment in primary exophthalmic goiter. We have rarely seen a definite cure following x-ray or radium therapy. When improvements are seen following roentgen therapy, one is uncertain whether to ascribe this to a remission in the disease rather than to a specific effect of the x-ray treatment. Furthermore, any subsequent operative procedure is probably rendered more difficult, owing to a tendency to excessive bleeding and marked periglandular adhesions. However, in a few relapsing cases, especially when the symptoms are caused by a small mass of recurrent or persistent thyroid tissue, we have seen some very good results from x-ray therapy.

SUMMARY

1. Of the 460 patients with thyroid disease not operated on previously, who were treated surgically from April 1, 1932, to April 1, 1937, 360 cases belonged to the toxic group and 100 cases were nontoxic.

2. The mortality (three cases) occurred in the toxic group.

3. The mortality (including one suicide) was 0.8 per cent among the primary cases of exophthalmic goiter.

4. Operative deaths numbered two (0.5 per cent) among the primary cases.

5. There were two operative deaths among twenty-six cases of recurrent exophthalmic goiter.

6. Twenty per cent of the patients were operated on in two stages.

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THE ONE HOUR-TWO DOSE DEXTROSE TOLERANCE TEST (EXTON-ROSE PROCEDURE)

DIAGNOSTIC SIGNIFICANCE

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The present study is a part of a survey¹ of dextrose tolerance tests of various types used in the Mayo Clinic between Nov. 1, 1935, and June 30, 1938, inclusive. The present report is confined to the analysis of results obtained with the one hour-two dose test introduced in 1931 by Exton and Rose.² A criterion for interpreting this test is presented which in our experience has given fewer doubtful laboratory diagnoses than could be obtained by other criteria applied in this test, or by any criteria applicable in other oral tests for dextrose tolerance.

Following the discovery of chemical procedures by which the presence or absence of sugar in the urine can be accurately determined, it was noted that glycosuria cannot be constantly demonstrated in patients with mild diabetes. In them glycosuria was found most frequently to follow the ingestion of certain foodstuffs, notably those that contain a high percentage of carbohydrate. Tests utilizing the principle of this observation were then introduced, with the hope that normal and diabetic individuals could be differentiated from one another by this means. An individual in whom diabetes was suspected was given an amount of carbohydrate ranging from 50 to 200 Gm. The urine was then examined at varying intervals for the presence of sugar. The discovery of glycosuria was thought sufficient to warrant a diagnosis of diabetes. This method, however, soon fell into popular disrepute because the ability of both normal and diabetic individuals to handle carbohydrate was subject to such wide variation that the test was unreliable. The objections to the method have been well summarized by Allen³ and by Hamman and Hirschman.⁴

From the Division of Clinical Pathology, Section on Parasitology (Dr. Magath), the Division of Biometry and Medical Statistics (Dr. Berkson), and the Division of Biometry and Medical Statistics (Mr. Gage), the Mayo Clinic.

1. Matthews, M. W.: A Study of the One Dose Three Hour (Standard) and the Two Dose One Hour (Exton-Rose) Glucose Tolerance Tests, unpublished thesis, Graduate School, University of Minnesota (the Mayo Foundation), February 1939.

2. Exton, W. G., and Rose, A. R.: Diabetes as a Life Insurance Selection Problem, *Proc. A. Life Insur. M. Dir. America*, 18: 252-286, 1931.

3. Allen, F. M.: Studies Concerning Glycosuria and Diabetes, Boston, W. M. Leonard, 1913, pp. 22-23.

4. Hamman, Louis, and Hirschman, I. I.: Alimentary Hyperglycemia and Glucosuria as a Test of Sugar Tolerance, *Tr. A. Am. Physicians* 31: 355-364, 1916; Studies on Blood Sugar: 1. Alimentary Hyperglycemia and Glycosuria as a Test for Sugar Tolerance, *Arch. Int. Med.* 20: 761-808 (Nov.) 1917.

The work of MacGregor, of Rollo and Ambrosini, of Bang and of Jacobson has been cited by Bailey.⁶ In 1856 the dependence of glycosuria on an increase of the concentration of sugar in the blood above the normal level was recognized by MacGregor and by Rollo and Ambrosini. The methods of analysis advocated by these workers were so complicated and inaccurate that dependence could not be placed on their observations. Bang in 1913 introduced the first satisfactory and clinically applicable method for the accurate determination of the blood sugar level. Jacobson in the same year noted that the ingestion of carbohydrate is followed by a rapid and often marked hyperglycemia. Fat and protein were found to produce no particular variation in the blood sugar level. These observations suggested to Hopkins,⁶ to Janney and Isaacson⁷ and to Hamman and Hirschman that the administration of carbohydrate followed by frequent determinations of the blood sugar might be used to determine the ability of an individual to handle carbohydrate. The use of such carbohydrates

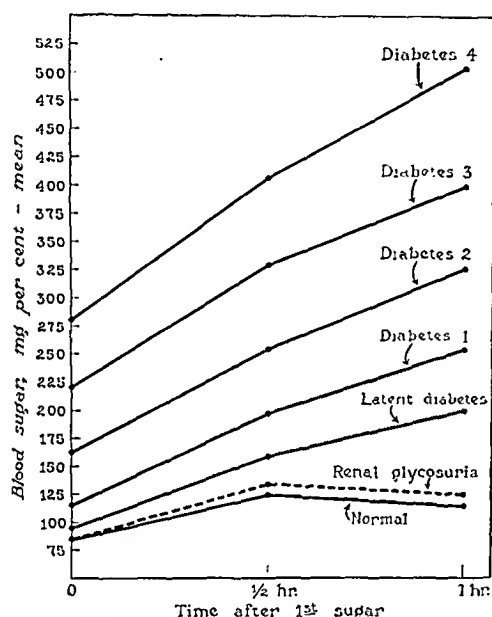


Chart 1.—Average blood sugar value (in milligrams per hundred cubic centimeters of blood) of members of this study.

as bread, crackers and oatmeal gruel as the test substance gave disappointing results. Apparently these products were broken down into their component food elements so slowly that their subsequent absorption from the intestinal tract imposed a metabolic strain on only those patients in whom a serious derangement of carbohydrate metabolism was present. Mild or even moderately severe cases of diabetes were frequently considered to have a normal metabolism for carbohydrate when this method was used.

Hamman and Hirschman in 1917 and Janney and Isaacson in the following year independently introduced dextrose as the test substance for determining the individual's ability to tolerate carbohydrate. The methods advocated by these two groups of observers differed only in the amount of dextrose that was administered. The former proposed the use of a standard amount of

dextrose, namely 100 Gm., while the latter advocated the use of dextrose in proportion to the number of pounds of body weight. The amount that was found to be most satisfactory was 1.75 Gm. of dextrose per kilogram of body weight. These two methods constitute essentially what is now known as the standard dextrose tolerance test. That this test has not proved a completely satisfactory procedure is demonstrated by the number of modifications that have at one time or another been proposed. It is not our purpose in this paper to enter into a discussion of all these various modifications. However, a comparatively recent modification of the test by Exton and Rose has gained widespread popularity, and it is with this modification that we here are primarily concerned.

The Exton-Rose procedure is based on what is known as Allen's⁸ paradoxical law of dextrose utilization. Briefly stated, the law is: The more sugar that is given to a normal individual, the more that is utilized. Limits of tolerance in nondiabetic individuals⁹ are all apparent, not real. There is no real limit to the ability of a normal person to utilize dextrose. In contrast, the inability of the person suffering from diabetes to handle dextrose is real. Large doses of sugar in these individuals are not utilized and assimilation may be made worse instead of better by overdosage. Exton and Rose, on the basis of this law, formulated the one hour-two dose dextrose tolerance test, or, as it is perhaps better known, the Exton-Rose procedure.

The technic of the test is as follows: One hundred Gm. of dextrose is dissolved in 650 cc. of water, making approximately a 15 per cent solution. This solution is flavored with lemon juice and is divided into two equal parts, each containing 50 Gm. of dextrose. The mixture is served cold. Following an overnight fast the bladder is emptied as completely as possible, and then the following steps are taken: (1) samples of blood and urine are collected and the first dose of dextrose is given, from one to two minutes being allowed for its ingestion; (2) thirty minutes after the ingestion of the dextrose a second sample of blood is collected and the second dose of dextrose is given, from one to two minutes being allowed for its ingestion, and (3) thirty minutes after the ingestion of the second dose of dextrose a third sample of blood and a second sample of urine are collected.

There is much physiologic research that supports the contention that the Exton-Rose procedure is based on sound physiologic principles. Hamman and Hirschman,¹⁰ MacLean and de Wesselow,¹¹ Hansen,¹² Foster,¹³ Lennox¹⁴ and Hale-White and Payne¹⁵ found that, if successive doses of dextrose are given

8. Allen, F. M.: Studies Concerning Glycosuria and Diabetes, Boston. W. M. Leonard, 1913, p. 1050.

9. This applies only to dextrose administered by mouth. Given intravenously, tolerance for dextrose is very definitely limited by the rate of administration, as was demonstrated by Blumenthal (quoted by Woodyatt, Sansum and Wilder) and later, with more precision of method, by Woodyatt, Sansum and Wilder (Prolonged and Accurately Timed Intravenous Injections of Sugar, J. A. M. A. 65: 2067-2070 [Dec. 11] 1915; Disease, Arch. Int. Med. 19: 311-334 [Feb.] 1917).

10. Hamman, Louis, and Hirschman, I. L.: Studies on Blood Sugar: IV. Effects on the Blood Sugar of the Repeated Ingestion of Glucose. Bull. Johns Hopkins Hosp. 30: 306-308 (Oct.) 1919.

11. MacLean, H., and de Wesselow, O. L. V.: The Estimation of Sugar Tolerance, Quart. J. Med. 14: 103-119 (Jan.) 1921.

12. Hansen, Karen M.: Investigations on the Blood Sugar in Man: Conditions of Oscillations, Rise and Distribution, Acta med. Scandinav., 1923, supp. 4, pp. 1-224.

13. Foster, G. L.: Studies on Carbohydrate Metabolism: II. An Interpretation of the Blood Sugar Phenomena Following the Ingestion of Glucose, J. Biol. Chem. 55: 303-314 (Feb.) 1923.

14. Lennox, W. G.: Repeated Blood Sugar Curves in Nondiabetic Subjects, J. Clin. Investigation 4: 331-352 (Aug.) 1927; Stimulation of the Sugar-Regulating Mechanism as Shown by Duplicate Blood Sugar Curves, J. Biol. Chem. 73: 237-249 (May) 1927.

15. Hale-White, R., and Payne, W. W.: The Dextrose Tolerance Curve in Health, Quart. J. Med. 19: 393-410 (April) 1926.

S. Bailey, C. V.: Studies on Alimentary Hyperglycemia and Glycosuria, Arch. Int. Med. 23: 455-483 (April) 1919.

6. Hopkins, A. H.: Studies in the Concentration of Blood Sugar in Health and Disease as Determined by Bang's Micro-Method, Am. J. M. Sc. 149: 254-267 (Feb.) 1915.

7. Janney, N. W., and Isaacson, V. L.: The Influence of Thyroidectomy on the Blood Sugar, Proc. Soc. Exper. Biol. & Med. 14: 99-100, 1916-1917; A Blood Sugar Tolerance Test, J. A. M. A. 70: 1131-1134 (April 20) 1918.

to man or animal on the same day, the second blood sugar curve reaches a peak at a lower level than the first curve, the third curve lower than the second, and so on. In the United States the phenomenon has come to be known as the Hamman-Hirschman effect; in Germany as the Staub¹⁶-Traugott¹⁷ phenomenon. Thalhimer, Raine, Perry and Buttles¹⁸ observed a rise in the blood sugar during the first hour in which 10 per cent solution of dextrose was given intravenously. Although the injection was continued at the same rate, the blood sugar level during the second hour declined progressively. Following the injection, hypoglycemic levels were often reached and in some cases symptoms of a mild hypoglycemic reaction were experienced.

The common explanation of the phenomena cited in these experiments is that carbohydrate stimulates the pancreas to produce more insulin and by repeated stimulation so much insulin is produced that the excessive amount causes hypoglycemia. Soskin and his co-workers¹⁹ have attacked this conclusion and, on the basis of a series of experiments on dogs, have maintained that the pancreas is not essential for such a reaction. On the other hand Ricketts,²⁰ also on experimental grounds, has challenged Soskin's interpretations. Without denying that the liver may play an independent part in the regulation of the blood sugar, the experiments of Ricketts indicate, he concluded, that the proper functioning of the liver under normal circumstances depends on the availability of an extra supply of insulin by the pancreas at the time of ingestion of carbohydrate.

The principal advantages of the Exton-Rose test over the standard test of tolerance for dextrose are as follows: 1. The shorter duration of the test tends to diminish the influence of certain external factors, such as hunger, anxiety, emotion, fatigue and impatience, on the character of the tolerance curve. Exton and Rose concluded that no more information as regards carbohydrate utilization could be obtained if the test was extended over a longer period than one hour. 2. Fewer venipunctures and fewer chemical determinations are necessary than under the standard test.

ANALYSIS OF RESULTS OBTAINED WITH THE EXTON-ROSE TEST OF TOLERANCE FOR DEXTROSE

In the present study a statistical analysis has been made of the results of the Exton-Rose procedure in a group of 117 individuals that were considered to have a normal tolerance for carbohydrate, a series of 304 individuals with diabetes that had been clinically graded according to the severity of the disease, and a series of seventy persons for whom the clinical diagnosis was renal glycosuria. In all three of these arbitrary classifications we have eliminated all cases with an associated condition, other than the disease diabetes, that might possibly influence the effect of ingested dextrose on the level of the blood sugar.

The diagnosis in some of these cases may not have been correct. On the contrary, being based on clinical

judgment, it was necessarily subject to error. Some sort of classification was necessary, however, and as each diagnosis was based on a thorough study of all aspects of each case by clinicians with special experience in diabetes²¹ it was considered the best basis available. An important part of this study consisted in a comparison of the blood sugar level during the various phases of the reaction with the clinical diagnosis previously recorded. It will occur to one that there is an element of circularity involved, for it may be said that the clinical diagnosis was based on the blood sugar observations. The objection is not as serious as it might appear to be. In the first place the clinical diagnoses were by no means based on blood sugar determinations alone but were made on clinical observations in conjunction with all laboratory examinations. Secondly, our conclusions, as will appear, are in favor of criteria other than those that were used to interpret the results of the Exton-Rose tests at the time the diagnosis was made, for these criteria are in fact a result of this study.

All patients with diabetes in the Mayo Clinic receive a clinical grading depending on the severity of the disease. An individual is said to have latent diabetes or

TABLE 1.—Averages and Range of Variation of Blood Sugar Values (in Milligrams per Hundred Cubic Centimeters of Blood) of Members of This Study

Clinical Diagnosis	Num-ber of Cases	Fasting Blood Sugar Reading		½ Hr. Reading		1 Hr. Reading	
		Aver- age	Range	Aver- age	Range	Aver- age	Range
Normal persons.....	117	84.6	63-110	125.9	79-176	114.8	54-170
Renal glycosuria.....	70	85.4	70-108	134.2	96-168	126.5	63-167
Diabetes							
Latent.....	37	94.5	73-139	159.4	116-246	200.5	161-273
Grade 1.....	210	114.5	68-234	197.4	111-319	235.4	167-423
Grade 2.....	30	162.0	84-268	235.2	173-376	327.0	154-464
Grade 3.....	22	220.4	93-408	330.8	127-536	399.7	182-626
Grade 4.....	5	281.6	128-572	407.0	246-608	504.4	341-770
All forms of diabetes	304	127.0	68-572	211.3	111-608	270.1	154-770

diabetes grade 1 if the urine can be maintained free from sugar on a qualitatively restricted diet. It is very doubtful if any one could distinguish clinically, or by any other method that we now have, between latent diabetes and diabetes grade 1. The term latent diabetes is reserved for the mildest form of the disease seen in practice. In most of these cases a dextrose tolerance test is necessary to establish the presence of the disease. Grade 2 diabetes exists if a weighed diet providing adequate calories and containing not more than 200 Gm. of carbohydrate is necessary to control the glycosuria. Grade 3 diabetes is said to be present if, in addition to such a weighed diet, 30 units or less of insulin each day is necessary to maintain the urine free from sugar. Grade 4 diabetes is diabetes that requires such a weighed diet and an amount of insulin greater than 30 units each day for its control.

Statistical analyses of the means and range of the blood sugar determinations during the various phases of the Exton-Rose procedure are summarized in table 1 and are presented graphically in chart 1.

The fasting blood sugar in those individuals whose carbohydrate metabolism was considered normal ranged from 63 mg. to 110 mg. per hundred cubic centimeters of blood. Only five persons had a fasting blood sugar that exceeded 100 mg. and in but one of these did the fasting blood sugar reach a height of 110 mg., which was the maximal concentration in the series. In contrast the fasting blood sugar readings for the persons

16. Staub, H.: Bahnung im intermediären Zuckerstoffwechsel, Biochem. Ztschr. 118: 93-102, 1921.

17. Traugott, Karl: Ueber das Verhalten des Blutzuckerspiegels bei wiederholter und verschiedener Art enteraler Zuckerrzufuhr und dessen Bedeutung für die Leberfunktion, Klin. Wchnschr. 1: 892-894 (April 29) 1922.

18. Thalhimer, William; Raine, Forrester; Perry, Margaret C., and Buttles, Jane: Effect of Injections of Dextrose and of Insulin and Dextrose on Blood Sugar: Preliminary Report, J. A. M. A. 87: 391-392 (Aug. 7) 1926.

19. Soskin, Samuel; Allweiss, M. D., and Cohn, D. J.: Influence of the Pancreas and the Liver on the Dextrose Tolerance Curve, Am. J. Physiol. 109: 155-165 (July) 1934.

20. Ricketts, H. T.: Carbohydrate Tolerance After Protamine Insulin: Its Bearing on the Physiology of Insulin Secretion, J. Clin. Investigation 17: 793-801 (Nov.) 1938.

21. The diagnosis in every instance was made by Dr. E. J. Kepler, Dr. E. H. Ryneearson or Dr. R. M. Wilder.

with latent or grade 1 diabetes ranged from 68 mg. to 234 mg. per hundred cubic centimeters of blood. Only 21 per cent of the members of this group had fasting blood sugar determinations that exceeded 120 mg. There was a 70 per cent overlap of the fasting blood sugar readings of the diabetic group into the range of the normal series (chart 2).

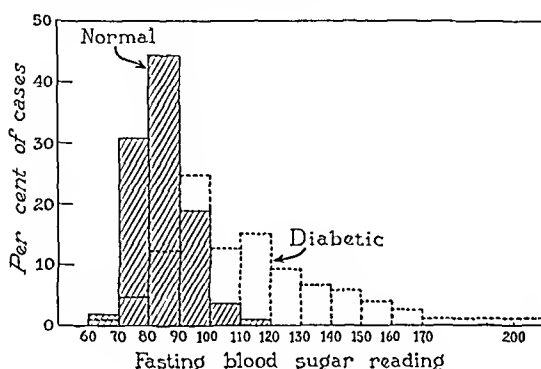


Chart 2.—Distribution of fasting blood sugar readings in 117 normal individuals and 247 persons with latent or grade 1 diabetes.

The average blood sugar level at any time point of the test is progressively elevated as one ascends the scale from normality and mild diabetes to the severer forms of the disease. In normal individuals and persons with renal glycosuria the rise in the blood sugar one-half hour after dextrose has been given is noted to be moderate when compared with the average rise that occurs in diabetes during the same period. The characteristic rise-fall reaction of the concentration of sugar in the blood of normal individuals and persons with renal glycosuria at the half hour and one hour points respectively is evident. The only significant distinction between normal individuals and persons with renal glycosuria as far as the tolerance test is concerned is the excretion of sugar in the urine by members of the latter group. In the various grades of diabetes the rise-fall reaction is absent, the average blood sugar value at one hour being higher than the average blood sugar value at the half hour reading. The importance of this observation will be referred to later.

TABLE 2.—Age Distribution: Average Blood Sugar Values During the Various Phases of the Reaction in Normal Individuals and Persons with Latent and Grade 1 Diabetes

Age, Years	Num-ber of Cases	Normal			Num-ber of Cases	Latent and Grade 1 Diabetes		
		Average B. S. Readings	½ Hr.	1 Hr.		Average B. S. Readings	½ Hr.	1 Hr.
0-29.....	34	82.5	121.8	103.8	14	99.6	163.7	234.6
30-49.....	57	84.9	127.1	118.6	120	108.1	189.7	241.3
50-79.....	26	86.9	128.5	121.4	113	116.6	196.7	255.1
Total.....	117	84.6	125.9	114.8	247	111.5	191.7	247.2
Youngest.....		2½ years				2 years		
Oldest.....		65 years				75 years		

Many investigators have reported a progressive elevation of the tolerance curve with advancing age. An analysis of our data supports this conclusion. Table 2 shows for the normal and grade 1 diabetic groups the effect of advancing age on the blood sugar values at the various phases of the reaction. It is seen that for all determinations, the fasting, half-hour and hour readings, the concentrations of sugar in the blood progressively increase with age.

The next step in our analysis was to apply the criteria that have been proposed by Exton and Rose and

also those of Gould, Altshuler and Mellen²² to the group of 117 normal individuals and 247 persons with latent or grade 1 diabetes. The criteria of Exton and Rose are:

A. *Normal tolerance curve:*

1. A fasting blood sugar within the normal limits of the particular blood sugar method employed.
2. A rise in the blood sugar which does not exceed 75 mg. in the thirty minute sample.
3. The blood sugar in the sixty minute sample is less, the same, or does not exceed the thirty minute sample by more than 5 mg.
4. All urine samples are negative to the Benedict test.

B. *Diabetic tolerance curve:*

1. A more or less steep curve of not less than 10 mg. of blood sugar following the second dose of dextrose.
2. The relation of the blood and urine sugar values to the severity of the disease.

C. *Renal glycosuria tolerance curve:*

1. Blood sugars which follow the normal tolerance curve or in any event never reach the diabetic level.
2. Sugar in both urine specimens.

D. *Alimentary glycosuria tolerance curve:*

1. Blood sugars that follow the normal curve even when the level is higher than normal.
2. A sugar-free urine after fasting, with sugar in the final urine specimen.

TABLE 3.—Comparison of Criteria When Applied to 117 Clinically Normal Individuals and 247 Persons with Latent or Grade 1 Diabetes

Diagnosis According to Criteria	Normal Individuals Diagnostic Criteria Applied				Latent and Grade 1 Diabetes Diagnostic Criteria Applied			
	Exton-Rose		Gould et Al.		Exton-Rose		Gould et Al.	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Normal.....	85	72.7	75	64.1	1	0.4	1	0.4
Diabetes.....	22	18.8	..	...	236	95.5	191	77.3
Nondiagnostic.....	10	8.5	42	35.9	10	4.1	55	22.3
Total.....	117	100	117	100	247	100	247	100

According to our interpretations of these criteria, if the fasting blood sugar is within normal limits and if the one hour reading does not exceed the half hour value by 10 mg. or more, even though the half-hour blood sugar determination is as high as 245 mg., the case cannot be considered as diabetic. It would seem that such a reaction is definitely abnormal and the possibility of diabetes should be seriously considered. Apparently but one requisite is necessary according to the criteria of Exton and Rose for a diagnosis of diabetes, and that is that the hour blood sugar determination should exceed the half hour reading by 10 mg. or more. If this condition is not fulfilled and the fasting blood sugar exceeds 120 mg., the case can be considered neither diabetic nor normal, and therefore the tolerance curve must be nondiagnostic. When the rise in the blood sugar one hour after the ingestion of the first dose of dextrose lies between 5 and 10 mg. above the half hour reading, again it must be called nondiagnostic. A curve that has a half hour blood sugar reading that is more than 75 mg. higher than the fasting value, while the other values of the curve are within normal limits, according to the criteria must be called alimentary hyperglycemia.

22. Gould, S. E.; Altshuler, S. S., and Mellen, H. S.: The One-Hour Two-Dose Glucose Tolerance Test in the Diagnosis of Diabetes Mellitus, *Am. J. M. Sc.* 193: 611-617 (May) 1937.

The criteria of Gould, Altshuler and Mellen are:

A. *Normal tolerance curve:*

1. The fasting blood sugar is less than 120 mg.
2. The half hour level is less than 50 mg. above the fasting value.
3. The level of the blood sugar at one hour is less than 30 mg. above the half hour value.

B. *Diabetic tolerance curve:* The presence of only two of the following three conditions indicates diabetes:

1. A fasting blood sugar of 120 mg. or over.
2. A half hour level of 50 mg. or more above the fasting value.
3. A one hour level of 30 mg. or more above the half hour level.

The difficulties that these criteria encounter are at once evident. Two out of the three criteria noted must be present in order to diagnose diabetes. Even if the fasting blood sugar level were grossly abnormal, say 400 mg. per hundred cubic centimeters of blood,

TABLE 4.—*Estimation of Effectiveness of Criteria in Designating Cases in Agreement with Clinical Diagnosis*

Series	Number	Correctly Diagnosed by Criteria			
		Exton-Rose		Gould et Al.	
		Number	Per Cent	Number	Per Cent
Normal.....	117	85	72.7	75	64.1
Diabetes.....	247	236	95.5	191	77.3
Total.....	364	321	88.2	266	73.1

TABLE 5.—*Effectiveness of Blood Sugar Levels as Criteria for Designating Cases in Agreement with Clinical Diagnosis*

Blood Sugar Reading	Critical Values of Blood Sugar (Mg. per 100 Cc. Blood)		Correctly Diagnosed by Criteria of Blood Sugar Level					
			117 Normal		247 Diabetic		364 Total Cases	
	Normal	Diabetic	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
	Fasting blood sugar	Less than 90	90 or more	74	63	218	88	292	80
½ hour blood sugar	Less than 142	142 or more	68	75	237	96	325	89
1 hour blood sugar	Less than 158	158 or more	111	95	247	100	358	98

if the half hour reading was less than 50 mg. above this figure and the hour reading was less than 30 mg. above the half hour determination the case could be called neither normal nor diabetic. Such a tolerance curve must therefore be nondiagnostic. The same reasoning applies when the half hour blood sugar reading exceeds the fasting level by more than 50 mg., while the two other values are within the normal limits that are specified by the criteria. Similarly, if the blood sugar at the one hour determination is 30 mg. or more above the half hour value, while the other readings are within the limits of normal as defined by the criteria of these investigators, the curve is again nondiagnostic. Gould and his collaborators do not consider the diagnosis of renal glycosuria and alimentary hyperglycemia. When we apply their criteria we shall consider renal glycosuria as a normal tolerance curve with glycosuria. An alimentary hyperglycemia type of curve fulfils only one of the three criteria, two of which are necessary for the diagnosis of diabetes, and cannot be considered as normal because it exceeds the 50 mg. rule of the half hour reading; it must therefore be called nondiagnostic. With such a variety of confusing combinations we should expect such criteria to yield a large percentage of nondiagnostic tolerance curves.

Tables 3 and 4 summarize the results of designating the normal and diabetic series according to the criteria of Exton and Rose and of Gould and his co-workers. It is seen from table 3 that, considering the 117 individuals clinically diagnosed as nondiabetic, 73 per cent were diagnosed normal by the Exton-Rose criteria and 64 per cent by the criteria of Gould and his co-workers.

TABLE 6.—*Distribution of the One Hour Blood Sugar Readings in 117 Normal Individuals and 247 Persons with Latent or Grade 1 Diabetes*

Blood Sugar Reading, Mg. per 100 Cc. of Blood	117 Normal Individuals		247 Persons with Latent or Grade 1 Diabetes	
	Number	Per Cent	Number	Per Cent
40-59	1	0.9	..	....
60-79	7	6.0	..	....
80-99	32	27.3	..	....
100-119.....	29	24.8	..	....
120-139.....	22	18.8	..	....
140-159.....	20	17.1	..	....
160-179.....	6	5.1	19	7.7
180-199.....	..	....	25	10.1
200-219.....	..	....	43	17.4
220-239.....	..	....	35	14.2
240-259.....	..	....	37	15.0
260-279.....	..	....	25	10.1
280-299.....	..	....	24	9.7
300-359.....	..	....	35	14.2
400 plus.....	..	....	4	1.6
Total.....	117	100	247	100
Average.....		114.8		247.2
Range.....		54-179		101-423

Of the 247 individuals in the diabetic series, 96 per cent were designated diabetic by the Exton-Rose criteria and 77 per cent by the criteria of Gould and his co-workers. In table 4 we see that, considering the entire series of 364 individuals, the application of the Exton-Rose criteria yielded diagnoses in agreement with clinical diagnosis in 88 per cent of the cases, while that of the criteria of Gould and his co-workers yielded 73 per cent in agreement with the clinical diagnosis.

It appeared to us on the basis of general observations of the level of the blood sugar at the fasting, half hour and hour points that a better differentiation between normal subjects and persons with diabetes might be made by considering the level of the blood sugar itself rather than the change of the value from one time to the next. Since each observation is necessarily subject to variation and error, the difference

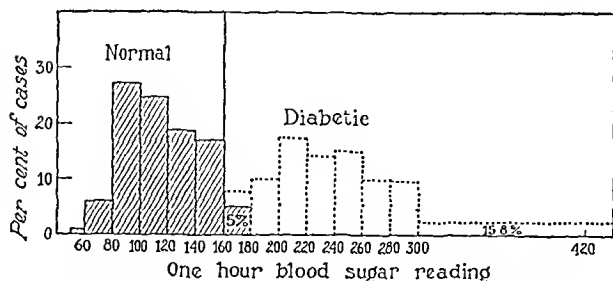


Chart 3.—*Distribution of the one hour blood sugar readings in 117 normal individuals and 247 persons with latent or grade 1 diabetes.*

between two observations, say, at the half hour and hour points, is, a priori, subject to more variability than the values themselves, though this is not necessarily true. At any rate we undertook to make an objective examination on the basis of the absolute values of the blood sugar determinations at each phase of the tests (table 1, chart 1). We decided to use as a criterion to demarcate normal individuals from persons with latent diabetes a value of the blood sugar half

way between the mean values for the particular point in the test. Thus, utilizing the fasting blood sugar as a criterion, the mean value for the normal group was 84.6 mg. per hundred cubic centimeters and the mean value for the latent diabetic group was 94.5 mg.; averaging these two groups, the figure of 90 mg. is obtained. Accordingly we reasoned that an individual who had a fasting blood sugar in excess of 90 mg. would be more likely to be diabetic. Conversely, a fasting blood sugar below 90 mg. would be more indicative of a normal tolerance for carbohydrate. Similarly, a half-hour blood sugar value of 142 mg. and an hour reading of 158 mg. were selected as critical levels. The results of applying these criteria to the 117 normal individuals and the 247 persons with latent or grade 1 diabetes are shown in table 5.

In table 5 it is seen that, using the fasting blood sugar alone, 63 per cent. of the normal persons and 88 per cent of the persons with diabetes would have been designated in agreement with the clinical diagnosis, giving for the entire series of 364 cases 80 per cent designated in agreement with the clinical observations by the criterion of the fasting blood sugar level alone. If the half-hour blood sugar reading is employed for the entire series, it is seen that 89 per cent were designated in agreement with the clinical diagnosis. If the hour reading of the blood sugar is used, 95 per cent of the normal persons were designated in agreement with the clinical findings and all the patients with diabetes were so designated, making, for the entire series, a designation of 98 per cent in agreement with the clinical diagnosis. This very close agreement, using the simple criterion of the level of the blood sugar at the hour reading, is due to the fact that according to the observations in our series the distribution of the hour reading is widely divergent in the normal and diabetic groups. This is shown by table 6 and chart 3.

It may be emphasized again that the criterion of the value of the blood sugar at the hour reading could not have been the one employed in making the clinical diagnosis in these cases, since this criterion was developed in the course of this study after all the clinical diagnoses had been designated in the histories.

COMMENT

The finding that the value of the blood sugar at a particular time point (one hour) of the curve obtained in a one hour-two dose test of dextrose tolerance has diagnostic significance of importance is in harmony with the observations of Hansen,²³ who emphasized that the normal organism has the capacity to accelerate the removal of sugar from the blood at times when values for blood sugar would otherwise rise abnormally. A result of such regulation is the establishment of a definite upper limit or blood sugar ceiling, called by Hansen the "optimum concentration." This upper limit, when dextrose is introduced into the blood stream at a rate no greater than is possible by absorption from the bowel, is normally never exceeded. Furthermore this upper limit, as Hansen has shown, is nearly the same value as that of the renal threshold for dextrose, which explains why glycosuria is avoided no matter how much sugar is ingested by normal persons. In such persons the highest values attained by the blood sugar after the ingestion of as much as 400 Gm. of dextrose were found by Hansen to lie between 160 and 180 mg. per hundred cubic centimeters.

Other causes of hyperglycemia being absent, a disturbance of the ability of the organism to prevent elevation of the blood sugar above what Hansen called the "optimum concentration" ought to represent a criterion of diabetes mellitus. This is exactly what is revealed by the blood sugar reading at one hour in a test like that of Exton and Rose. The amount of dextrose administered by mouth in such a test must be large enough to effect a maximum rate of absorption from the bowel at the time (one hour) blood is taken for analysis, but the amount provided in the Exton-Rose test is ample. According to Hansen as great an elevation may be obtained with 50 Gm. as with 200 or 400 Gm.

It is possible that the one hour reading of the blood sugar would be equally significant diagnostically if all the dextrose (100 Gm.) was ingested at the zero hour instead of in the two doses, each of 50 Gm. at half hour intervals, as called for in the Exton-Rose procedure. Dividing the dose is helpful, however, because it avoids an unpleasantly large dose at one time. It also is not improbable that the second dose, given thirty minutes after the first, increases the divergence of the one hour blood sugar values because of a Hamman-Hirschman (Staub-Traugott) effect in cases without diabetes. This may explain the greater diagnostic significance of the value of the blood sugar at one hour in the Exton-Rose test over that at thirty minutes.

In view of these considerations we are not suggesting any change in the procedure of the tolerance test of Exton and Rose and have limited our comments to the interpretation of the values for blood sugar obtained with the test as originally described. Our results do suggest, however, that the test may be simplified without loss of reliability by the omission of two of the three samplings of blood originally called for, namely the one before the dextrose is given and the one at thirty minutes.

CONCLUSIONS

1. Advancing age produces a progressive elevation of the blood sugar level at every phase of the blood sugar time curve obtained with the dextrose tolerance test of Exton and Rose. The degree of this, however, is insufficient to invalidate conclusions 2 and 3.

2. A fasting blood sugar that exceeds 120 mg. per hundred cubic centimeters of blood is diagnostic of diabetes. This value, however, was exceeded by only 21 per cent of the persons with diabetes in this series of cases in which diabetes was minimal. In contrast, no person in whom the carbohydrate tolerance was considered normal had a fasting blood sugar that exceeded 110 mg.

3. According to our experience, the most effective criterion, with the Exton-Rose procedure, for differentiating persons suffering from diabetes and normal persons is the hour value of the blood sugar. If 158 mg. per hundred cubic centimeters of blood is taken as the critical level so that individuals showing a blood sugar reading below this level at the hour are designated nondiabetic and individuals with readings at or above this value are designated presumptively diabetic, a high percentage of correct diagnoses can be expected. As far as the observations in this series are concerned, all individuals with values at the hour less than 154 mg. were found to be normal, and all individuals with values at the hour of 180 mg. or more were found to be diabetic. Hence these two groupings are most definite. Individuals with values at the hour between 158 and 179 mg. inclusive constituted only a small fraction of our cases (six, or 5.1 per cent, of 117 patients con-

23. Hansen, Karen M., cited by Faber, Knud: Benign Glycosuria Due to Disturbances in the Blood Sugar Regulating Mechanism, *J. Clin. Investigation* 3: 203-227 (Dec.) 1926.

sidered to be nondiabetic and nineteen, or 7.7 per cent, of 247 patients considered to have latent or mildest diabetes). The number of cases with a doubtful laboratory diagnosis was smaller by this criterion than by any other criterion applied to the results of the Exton-Rose test. It also was smaller than that obtained by any criteria applied to the interpretation of other oral tests for dextrose tolerance with which we have had experience.²⁴

THE ROENTGEN ANATOMY OF THE SMALL INTESTINE

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Anatomically, the small intestine is a convoluted tube which begins in the upper part of the abdomen just distal to the pylorus and ends at the ileocecal valve. Roentgenologically, it is a highly active and dynamic organ with certain characteristic anatomic and physiologic features. Normal roentgen morphology is, for the most part, dependent on muscular tone, physiologic motion, mucosal pattern or a combination of these three factors.



Fig. 1.—The lumen of the small intestine diminishes from above downward. This shows the roentgenologic appearance of the duodenum, jejunum and ileum.

The length of the small intestine is variable. At autopsy it may measure from 5 to 7 meters. Intubation by measured length of tubing has indicated a length of

from 2.5 to 3 meters from the pylorus to the cecum. Such figures, however, may not be accurate because the intestine may telescope itself along the course of the tube and thus produce abnormal shortening. It is generally assumed that the upper three fifths of the



Fig. 2.—The normal mucosal pattern in the jejunum is herring bone or reticular.

mesenteric small intestine is jejunum and the lower two fifths is composed of ileum. On the basis of embryologic and roentgenologic data, Cole¹ has described six primary coils of small intestine. The first coil is the duodenum, while the remaining five groups comprise the ileojejunum, or mesenteric small intestine. In my experience, many variations in the appearance of these coils have occurred.

In 1936 Pendergrass and his associates² stressed the importance of a standard type of meal for the study of the small intestine. The meal that I have used is made of 5 ounces of distilled water and 5 ounces of barium sulfate. Water is distilled to remove the chlorine, which may produce a disturbance in the roentgen appearance of the intestinal tract. A standard preparation of barium sulfate has been found to be quite satisfactory. Recently I compared this usual preparation with a meal composed of water and more finely divided barium. A striking difference in the small intestinal pattern and motility was found when these two meals were studied in the same patient.

Factors such as the composition, size and consistency of the meal, speed of gastric emptying, drugs, emotional disturbances, disease and reflex disturbances from disease outside the gastrointestinal tract are capable of producing changes in the roentgen appearance of the small intestine. In this presentation the discussion will be limited to the roentgen anatomy as seen in healthy subjects.

1. Cole, L. G., and others: Radiologic Exploration of the Mucosa of the Gastro-Intestinal Tract, St. Paul and Minneapolis, Bruce Publishing Company, 1934, p. 61.

2. Pendergrass, E. P.; Ravdin, I. S.; Johnson, C. G., and Hodes, P. J.: Studies of the Small Intestine: Effect of Foods and Various Pathologic States on Gastric Emptying and Small Intestinal Pattern, Radiology 26: 651-662 (June) 1936.

24. The analytic technic used in the examinations for concentration of blood sugar was that of Folin and Wu, and all specimens of blood were obtained from the vein. For other methods of analysis or for blood taken for analysis from arteries or capillaries, the values for blood sugar accepted here as criteria for diagnoses would be modified. It also must be emphasized that the diagnostic significance of any values for blood sugar will be modified by all the various conditions, other than the presence or absence of the disease diabetes, that are known to modify blood sugar time curves. Such conditions include previous fasting, preceding diets low in carbohydrate and complications such as infection and hyperthyroidism.

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Read before the joint meeting of the Section on Gastro-Enterology and Proctology and the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

In the normal controls that I have studied, the head of the meal reaches the cecum in from one and a half to three hours. The small intestine is completely empty in from five to six hours. The caliber of the lumen diminishes from above downward (fig. 1). Roent-

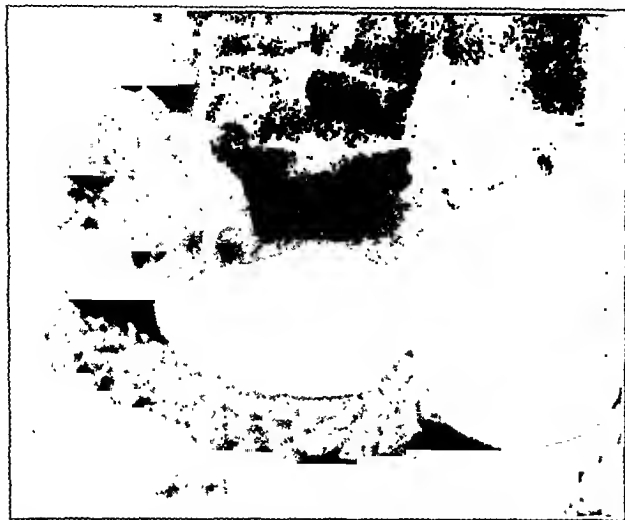


Fig. 3.—Note the longitudinal folds in the duodenal cap and the coarse, reticular pattern of the remainder of the duodenum. The duodenal stream is intermittent.

genologically, one can distinguish duodenum, jejunum and ileum, although the line of demarcation between them is not well defined. The duodenum, which begins just distal to the cap at the first circular fold of mucosa, is short, wide and relatively fixed in position. It forms

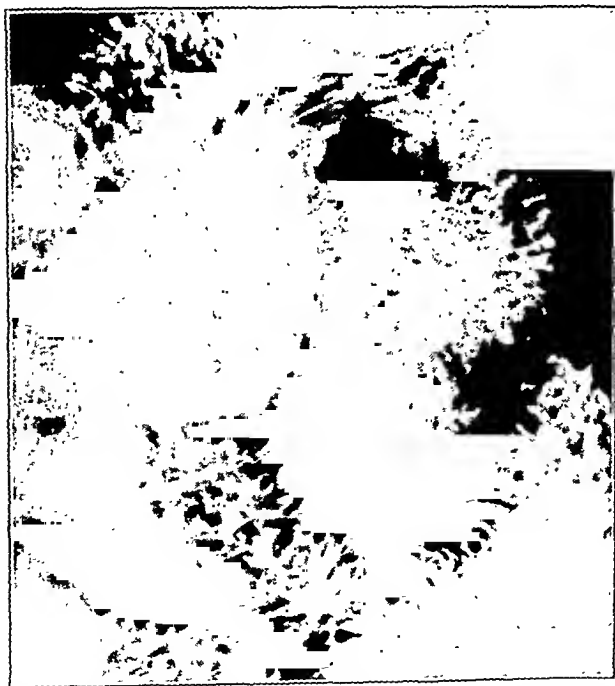


Fig. 4.—A bolus of barium sulfate passing rapidly through the proximal jejunum. Note the widened loop with the obliterated mucosal pattern. Proximal to the bolus, the mucous membrane folds all points in the direction of motion.

an incomplete loop around the head of the pancreas and may be divided into a superior, a descending, a transverse and an ascending portion. The cap and superior duodenum are usually retentive, but in the remaining

portions of the duodenum peristaltic rushes and to and fro motion may be seen. In the duodenum the stream is of the intermittent type. Beyond the suspensory ligament of Treitz the speed of forward motion decreases. The barium stream tends to be continuous with an occasional peristaltic rush. Through the jejunum and ileum the progress of the meal is mostly a gradual creeping forward of the contents, becoming slower as it approaches the cecum. This progress is so slow that it is practically impossible to study the barium stream continuously because of the danger of overexposure to the patient. In some instances a complete arrest of the meal may occur in the ileum. If the patient is then allowed to eat, the contents will proceed into the colon without further delay.

The mucosal pattern of the small intestine shows many variations which seem to be specific for a given



Fig. 5.—The "snow flake" pattern, indicating retention of particles of barium in the mucous membrane folds after the main portion of the barium meal has passed.

set of physical conditions. Such a pattern is derived from the primary circular folds of Kerkring and from the secondary induced folds which may occur in the mucous membrane. The primary folds of Kerkring are largest in the duodenum and jejunum, become smaller and less frequent in the lower jejunum and ileum and may be poorly developed or absent in the terminal ileum. They are not obliterated by distention and they persist in postmortem specimens. Such folds project into the lumen of the small intestine in a circular or spiral form. Adjacent folds may be of different heights and point in different directions. According to Forsell³ the mucous membrane folds adapt themselves to the muscular contractions of the intestinal wall and also to the consistency and form of the meal. During roentgenographic examinations one is studying a working pattern; therefore the pattern of a given segment

3. Forsell, G.: Role of Autonomous Movements of the Gastrointestinal Mucous Membrane in Digestion, *Am. J. Roentgenol.* 42:143, 165 (Feb.) 1939.

depends on its anatomic character and also on its physiologic activity at the time of the examination. In the duodenum the pattern is coarsely reticular but may sometimes resemble stacked coins (fig. 3). While the stomach and duodenum are emptying, the jejunum shows a reticular or herring bone pattern when thinly coated by barium (fig. 2). During the passage of large boluses, the pattern may be obliterated except for circular folds near the periphery (fig. 4). As the meal progresses distally a "snow flake" pattern occurs owing to retention of small quantities of barium in the vasa digestiva (fig. 5). The central lumen is variable. When small amounts of barium coat the mucous membrane, the folds can be seen to meet near the center of the intestine. When larger quantities of barium are present, one cannot be certain of the presence of a central canal because of the obliteration of the pattern. If a small

Failure of rotation may result in finding the small intestine in the right half of the abdomen and the colon to the left side of the midline. This condition, also called mesenterium commune, is easily recognized by roentgen examination.



Fig. 7.—Mucous membrane pattern in the ileum. This appearance has been called the "stacked coin" pattern.



Fig. 6.—Longitudinal folds in the jejunum occurring as a result of segmental contraction.

quantity of gas is present, the central lumen may be more readily observed. Longitudinal folds of mucosa, the "barring" pattern of Forssell, may occur as a result of segmental contraction in the jejunum (fig. 6). Occasionally, one also sees a localized fuzzy appearance which I have attributed to a rapid movement at the time of examination.

In the proximal ileum the pattern is somewhat similar to that in the distal jejunum. Farther along in the ileum the pattern gradually changes. Frequently a continuous or segmented column of barium without a visible profile pattern is present. In other instances the pattern may resemble a stack of coins (fig. 7). Sometimes one observes a sharp change in density of the barium in the ileum as a result of increased secretion or dilution of the meal. Near the terminal ileum, longitudinal folds can sometimes be identified.

The frequency with which normal variations and congenital anomalies of the small intestine occur depends largely on the thoroughness of the examination and the examiner's ability to detect them.



Fig. 8.—Multiple large diverticula of the small intestine. Note that they are all placed along the mesenteric border.

Intra-abdominal hernia can be diagnosed by roentgen study of the small intestine. In this condition the coils are grouped closely and they may occupy the right, left or midabdominal position. In the patients studied by

Alexander⁴ the distal duodenum and duodenojejunal junction were located in an abnormal position.

Enterogenous cysts and aberrant pancreatic tissue are rare anomalies which may produce anatomic deformity of the duodenum. When small, these deformities are



Fig. 9.—Congenital veil producing distortion of the second portion of the duodenum. This patient also had gallstones, but there were no adhesions between the gallbladder and the duodenum. The arrow points to the duodenal deformity.

seen as an obliteration of the normal mucosal pattern, with or without a central filling defect simulating a polyp.

Congenital diverticula of the small intestine occur most frequently in the duodenum. Usually placed along the inner curvature, they vary in size from a few millimeters to several inches in diameter (fig. 8).

Congenital membranes and veils attached to the duodenum may produce roentgenologic appearances



Fig. 10.—Congenital anomaly of the jejunum resulting in a narrow segment. Note the dilatation and retention of the barium proximal to the lesion. Arrows point to the area of involved intestine.

which in some instances cannot be differentiated from pericholecystic adhesions or duodenal ulcers (fig. 9).

In 1906 Ochsner⁵ called attention to a more or less marked thickening of the intestinal wall from 2 to 4 cm. below the entrance of the common duct. Microscopic

sections taken from various portions of the intestinal wall demonstrated that this thickness was due to an increase in the number of circular muscle fibers present. The arrangement was somewhat like that seen at the pylorus, although the fibers were spread out in a more diffuse fashion. Ochsner was of the opinion that inflammatory processes in the duodenum or biliary tract might result in delayed passage of the contents because of spasm of these muscular fibers. I have not been able to corroborate his anatomic observations by roentgen examination of healthy persons.

Congenital defects which result in a narrowed small intestinal lumen or complete atresia are most commonly found in children. In most of the cases, these defects are incompatible with life. The routine use of study of the small intestine has enabled me to diagnose in one instance a narrowed jejunum in a white man. Operation on him revealed that approximately 5 inches of the jejunum was reduced to half its normal outside circumference. The lumen of this portion of the intestine was about the size of a lead pencil (fig. 10).



Fig. 11.—Lane's kink of the terminal ileum. The point of fixation of the ileum is indicated by arrow a; b is the tip of the appendix.

Meckel's diverticulum may sometimes be found during roentgen examination of the small intestine. In some instances this anomaly has produced a serious impairment of function as well as a definite anatomic deformity of the small intestine. I have seen a Meckel's diverticulum as large as one's thumb which was completely missed by roentgen study and two abdominal operations. In another instance the diverticulum was so large that it was mistaken for a segment of the small intestine. Whenever delayed motility occurs in the ileum, one should examine the intestine carefully for this anomaly.

Ileal stasis, a term seldom used in recent years, may result from a Lane's kink. One may suspect this condition if a partial obstruction is associated with a kinked and somewhat fixed terminal ileum. The anatomic deformity is thought to be due to adhesions which bind the mesentery of the lower ileum to the iliac fossa⁶.

4. Alexander, F. K.: Roentgen Diagnosis of Intra-Abdominal Hernia, *Am. J. Roentgenol.* 38: 92-101 (July) 1937.

5. Ochsner, A. J.: Constriction of the Duodenum Below the Entrance of the Common Duct and Its Relation to Disease, *Ann. Surg.* 43: 80-87, 1906.

6. Jordan, A. C.: Radiography in Intestinal Stasis, *Proc. Roy. Soc. Med.* 5: 9-37, 1911.

(fig. 11). Clinically, some of these patients have been suspected of having duodenal ulcer, but their symptoms have been relieved by releasing the fixation of the terminal ileum.

The value of a roentgen study of the small intestine is increased by the use of a standard type of meal and technic of examination. With such a basis a specific roentgen appearance may be established for normal subjects. Such studies may well result in a clearer conception of the roentgen anatomy in disease states.

ROENTGENOLOGIC MANIFESTATIONS OF NON-NEOPLASTIC LESIONS OF THE SMALL INTESTINE

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My purpose in this paper is to discuss the roentgenologic manifestations of the more commonly encountered non-neoplastic diseases of the small intestine. There is not a great variety of such processes. Peptic ulcer of the duodenum and of the jejunum occurring after gastro-enterostomy is omitted, because these parts are so intimately associated with the stomach that they are more properly considered in connection with lesions of that organ. Acute inflammatory processes of the small intestine are not included because patients afflicted with them rarely are, and probably never should be, submitted to roentgenologic examination. Syphilitic and actinomycotic lesions of the small intestine have been reported in the literature, but such lesions are so exceedingly rare that for practical purposes they may well be omitted from a discussion of this kind. The literature also contains reports of cases in which animal parasites, notably *Ascaris lumbricoides*, have been demonstrated in the small intestine at roentgenologic examination; such instances are also comparatively rare, and the condition is mentioned here only by way of recognizing it. The non-neoplastic lesions of the small intestine more commonly encountered may be listed as follows, and this discussion will be confined to these:

1. Chronic enteritis.
Tuberculous enteritis.
Nontuberculous enteritis.
2. Diverticula.
Meckel's diverticulum.
3. Deficiency states.
4. Co-involvement of the small intestine by extrinsic non-neoplastic lesions.

THE ROENTGENOLOGIC EXAMINATION OF THE SMALL INTESTINE

I shall not attempt to describe the conduct of the roentgenologic examination of the small intestine in detail. However, the roentgenologic appearance of even the normal small intestine may vary widely, depending on the technic employed in the examination; therefore it seems proper to describe at least those features of the examination considered to be important.

The patient presents himself for examination in the morning after an overnight period of fasting. The first step is the roentgenoscopic survey of the abdominal field. If there is no evidence of intestinal obstruction the examination may proceed. The patient is asked to

drink 8 ounces (240 cc.) of a suspension made of equal parts by volume of barium sulfate and water. The roentgenoscopic examination of the stomach and duodenum is made in the usual way. Then the examiner attempts to express as much as possible of the opaque suspension from the stomach into the duodenum and jejunum. This is the first of a series of attempts the examiner makes to prevent a wide dispersion of the opaque material through long reaches of the small intestine. Ideally the suspension will be confined to the smallest possible number of intestinal loops and will be carried down the intestinal tract as a coherent compact mass. Usually only a certain quantity can be expressed from the stomach at a single roentgenoscopic session lasting from five to ten minutes, but enough will have left the stomach to permit satisfactory examination of the entire duodenum and upper coils of jejunum. The patient is then permitted to rest for a brief interval. To accelerate the spontaneous discharge of the rest of the opaque suspension from the stomach the patient is instructed to lie relaxed on his right side, for it seems that the stomach empties itself best in this posture. After from ten to fifteen minutes a lower series of intestinal coils are filled with the opaque suspension and the patient is again submitted to roentgenoscopic examination. Periods of rest followed by roentgenoscopic observations are repeated at intervals of fifteen minutes until the stomach has delivered all but an insignificant quantity of the suspension of the opaque medium into the intestine. At about this time a lull in the more vigorous intestinal movements sets in, and unless the intestine is stimulated to activity again the opaque material tends to become widely dispersed without distending the coils in the desired way referred to. A simple palatable breakfast, preferably chosen by the patient according to his taste and custom, is a pleasant and practical way to stimulate the intestinal motility at this phase of the examination. Immediately after breakfast, periodic roentgenoscopic examinations are resumed until such time as the opaque material has made its way to the lowermost portion of the ileum and cecum. The time required for the contrast material to pass from the stomach to the cecum varies considerably in apparently normal persons. Forty-five minutes of elapsed time is not considered to be abnormally fast; four or five hours, not abnormally slow.

Roentgenographic examinations, with or without the use of the Potter-Bucky diaphragm, are made at the examiner's discretion, to clarify doubtful or suggestive areas of abnormality and to supply a permanent record of the roentgenologic manifestations. It is worthy of emphasis, however, that the roentgenoscopic examination is the cardinal roentgenologic maneuver, and, in my opinion, no number of roentgenograms could satisfactorily supplant it.

To me the most satisfactory way of examining the lowermost portion of the ileum is by filling it in retrograde direction through the ileocecal orifice at the conclusion of the examination of the colon, by using a contrast enema. Examination is made before and after the patient is permitted to empty the opaque fluid from the colon. Under these circumstances the ileal coils are elevated out of the bony pelvis, are filled with fresh, undehydrated contrast fluid, and are well visualized and readily manipulated. Retrograde filling of the lowermost portion of the ileum can be effected in most cases if the examiner will make a special effort to do so. It is well to consider the roentgenologic examination of the lowermost portion of the ileum as part of the

From the Section on Roentgenology, the Mayo Clinic.
Read before the joint meeting of the Section on Gastro-Enterology and Proctology and the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

examination of the colon in much the same way as the examination of the duodenum is considered to be part of the examination of the stomach.

CHRONIC ENTERITIS

Pathologically, chronic enteritis, using this term in its broadest possible sense, would include chronic intestinal lesions of tuberculosis, syphilis, bacillary dysentery and lymphopathia venereum as well as lesions caused by pathogenic fungi and parasites, and lesions for which a specific etiologic agent has not as yet been determined. It is probable that these lesions, whatever their cause may be, will have very similar gross pathologic features and they will be distinguished from one another only by their microscopic characteristics. Syphilitic, mycotic, parasitic and proved specific bacillary and streptococcal forms of enteritis occur so rarely as to be negligible in a practical consideration. Tuberculous enteritis and a nonspecific form of chronic enteritis of undetermined origin are the most common types of chronic enteritis encountered in practice.

In the truly voluminous literature that has accumulated on these two forms of chronic enteritis the clinical, pathologic, roentgenologic and therapeutic phases have been studied and described so often and so well that further elaboration seems not only unnecessary but presumptuous. I wish only to emphasize that the two diseases have many clinical, morphologic and roentgenologic features in common and to submit some suggestions for making at least a presumptive roentgenologic distinction between them.

Traditionally, intestinal tuberculosis is described as being either ulcerative or hyperplastic in character. Practically, a purely ulcerative or purely hyperplastic tuberculous intestinal lesion is but rarely encountered. Usually a combination of ulceration and hyperplasia is observed, and one or the other feature is found to be predominant in the picture. A true hyperplastic tuberculous lesion of the small intestine is notoriously uncommon.



Fig. 1.—Left, colon distended with contrast enema; right, after evacuation of contrast enema and redistention with air. Tuberculous ileocolitis. The patient had cavernous tuberculosis of the right lung.

mon. Masson and McIndoe¹ reported the one case in which a lesion of this type was observed at the Mayo Clinic and, significantly, the lesion was discovered in a part of the small intestine caught in a right paraduodenal hernia. Traditionally, too, tuberculosis of the intestine is considered to be a combined enterocolic

disease, that is, tuberculous lesions are observed to be distributed throughout the colon and in the small intestine as well, and especially in the ileocecal region. This distribution of tuberculous lesions is but the rule to which there are many exceptions. Proliferation, necrosis, cicatrization, ulceration and perforation, with development of extra-enteral abscesses and fistulas, are

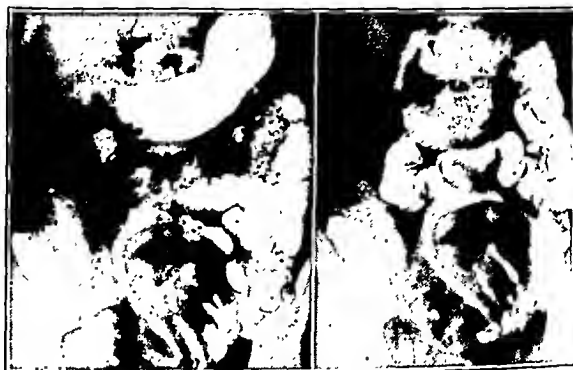


Fig. 2.—Left and right, phases in the examination of the small intestine. Tuberculous ileitis. At necropsy no other focus of tuberculosis was found.

universally recognized features in the pathogenesis of tuberculous intestinal lesions.

In 1932 Crohn, Ginzburg and Oppenheimer² reported a series of cases of benign, subacute or chronic, necrotizing and cicatrizing inflammation of the small intestine. Neither these observers nor any of the many who have conducted investigations on the cause of the disease since that time have given a satisfactory answer as to its cause. The pathologic features of the disease have been described in detail, and the similarity of the gross pathologic characteristics of this disease to those of intestinal tuberculosis is striking in all descriptions. As in tuberculous enteritis, the pathologic process is subacute or chronic; proliferation, necrosis, ulceration, cicatrization, perforation and the formation of perienteral and extra-enteral abscesses and fistulas are characteristic features. Macroscopically, it is always difficult, and usually impossible, to distinguish the nontuberculous from the tuberculous form, and cases have been reported, that of Schapiro³ being a noteworthy example, in which the ultimate correct diagnosis was in doubt even after expert and thorough microscopic examination. If distinction between the two diseases is difficult, even when the diseased tissue is made available for macroscopic examination, it is hardly surprising that a roentgenologic differentiation should also be difficult, as indeed it is. The following observations have been found to be of value, at least in cases in which the original pathologic process has not been too badly obscured by very extensive ulceration and development of abscesses and fistulas.

Like the colon, the small intestine is a tubular organ, and since pathologic processes deform the one in much the same way as they do the other, the same roentgenologic criteria of diagnosis can be applied to the small intestine as are applied to the large intestine. There are several forms of chronic colitis and, as I have pointed out elsewhere,⁴ all of them deform the

2. Crohn, B. B.; Ginzburg, Leon, and Oppenheimer, G. D.: Regional Ileitis: A Pathologic and Clinical Entity, *J. A. M. A.* 99:1323-1329 (Oct. 15) 1932.

3. Schapiro, I. S.: Hypertrophic Jejuno-Ileitis—Tuberculous or Not? *J. Mount Sinai Hosp.* 1:121-124 (Sept.) 1934.

4. Weber, H. M.: The Roentgenologic Identification of Commonly Encountered Chronic Ulcerative Diseases of the Colon, *Am. J. Roentgenol.* 30:488-496 (Oct.) 1933.

1. Masson, J. C., and McIndoe, A. H.: Right Paraduodenal Hernia and Isolated Hyperplastic Tuberculous Obstruction: Comment and Report of Case Affecting Jejunum and Ileum; Operation and Recovery, *Surg., Gynec. & Obst.* 50:29-39 (Jan.) 1930.

colon in the same fundamental ways. The roentgenologic distinction between the different etiologic types of chronic colitis is made chiefly on the distribution of the pathologic process in the colon, but roentgenologic evidence of disease in other organs and the results of other clinical tests must frequently be drawn on to reach the final diagnosis. Besides these, the experienced observer can frequently recognize what, for want of a better term, I have called a certain "look" by which, intuitively almost, he perceives the underlying cause for the changes he sees. The roentgenologic manifestations of the different forms of chronic colitis are much more familiar than those of similar processes in the small intestine because of their very much greater incidence, but the same roentgenologic diagnostic criteria are applied to lesions of both parts of the intestine.

As has been mentioned, the tuberculous and nontuberculous forms of chronic enteritis have so much in common morphologically that the two are not readily distinguished from each other even at gross pathologic examination and, therefore, not at roentgenologic examination. But, as in the colon, close comparison of the roentgenologic appearances often shows a different roentgenologic "look" of the two diseases.⁵ This is largely related to the contours the affected segment assumes when filled with the contrast material. The contours of the tuberculous intestine have typically a rougher, more corrugated, appearance corresponding to a more irregular, disconnected insemination of the ulcerohyperplastic process (figs. 1 and 2). In its roentgenologic manifestations the nontuberculous form of chronic enteritis imitates the classic, familiar picture of chronic ulcerative colitis very closely. The contours are characteristically smooth and the narrowing is uniform, corresponding to the typical diffuse, even development of the underlying pathologic process (figs. 3 and 4).

Other aids in the differentiation are chiefly those concerned with the exclusion of tuberculosis. Investigation of extra-enteral foci of tuberculosis, especially in the

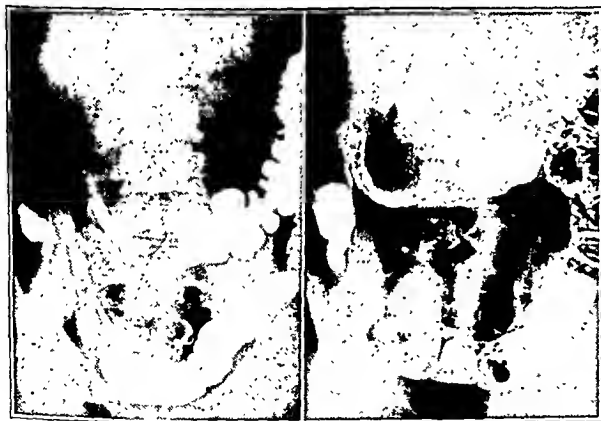


Fig. 3.—Left, colon after evacuation of the contrast enema; right, after redistention with air. Nontuberculous ileocolitis. Microscopic examination of the resected specimen failed to show evidence of tuberculosis.

lungs, should always be made when evidence of chronic enteritis is at hand. If a focus of active pulmonary tuberculosis is found to be coexisting with any non-neoplastic lesion of the small intestine below the duodenum, the intestinal lesion should be considered tuberculous until proved otherwise. Conversely, in the

absence of such a focus the intestinal lesion is likely to be nontuberculous. Isolated intestinal tuberculosis occurs just often enough, however, that this conclusion is not to be drawn definitively. Instances in which nontuberculous enteritis is associated with pulmonary tuberculosis of questionable activity have also been observed.

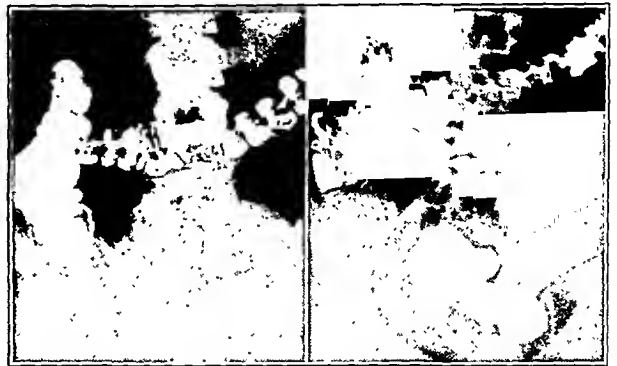


Fig. 4.—Left, ileum and upper part of colon filled with opaque suspension administered by mouth; right, after evacuation of opaque enema. Nontuberculous ileitis. At necropsy, no evidence of tuberculosis was found either in the intestine or elsewhere in the body.

Other diagnostic clues may be offered by the discovery of calcified mesenteric lymph nodes, the application of intradermal tuberculin tests and the search for *Mycobacterium tuberculosis* in the stools. It is granted, of course, that a definitive diagnosis will certainly not be reached in many instances, and the roentgenologic examiner will often find it necessary to confine his diagnosis to a description of the general morphologic character of the process and its distribution in the intestinal tract. His clinical and surgical colleagues will be able to carry on if this is done with a reasonable degree of accuracy.

DEFICIENCY STATES

Peculiar changes in the roentgenologic appearance of the small intestine are often observed in certain states of dietary deficiency, especially when steatorrhea, with or without diarrhea, is one of the principal clinical features. These roentgenologic changes have been seen in such conditions as nontropical sprue, pellagra, celiac disease in children, pancreatic insufficiency, chronic alcoholism and some other conditions of long continued primary or secondary nutritional deficiency. At present I am not prepared to state that the roentgenologic appearance of the small intestine is identical in all of the different types of deficiency disease enumerated. But this much can be said: Whenever these changes are encountered in the roentgenologic examination of the small intestine, they have many features in common, and a distinction between the various types of deficiency disease on the basis of roentgenologic appearances alone is not as yet attempted.

Pillai and Murthi,⁶ Snell, Camp and Watkins,⁷ Mackie and Pound,⁸ Golden⁹ and others have described the roentgenologic changes seen in these conditions. One of the surprising features is the marked depression

5. Weber, H. M.: Discussion, Proc. Staff Meet., Mayo Clin. 11: 718-720 (Nov. 4) 1936; Regional Enteritis: Roentgenologic Manifestations, *ibid.* 13: 545-550 (Aug. 31) 1938.

6. Pillai, M. J. S., and Murthi, K. N.: Radiologic Signs in Cases of Sprue: A Study of Nine Cases, *Indian J. Med.* 12: 116-118 (June) 1931; *abstr. Trop. Dis. Bull.* 29: 8 (Jan.) 1932.

7. Snell, A. M.; Camp, J. D., and Watkins, C. H.: Nontropical Sprue (Chronic Idiopathic Steatorrhea), *Proc. Staff Meet., Mayo Clin.* 10: 177-184 (March 20) 1935.

8. Mackie, T. T., and Pound, R. E.: Changes in the Gastrointestinal Tract in Deficiency States, with Special Reference to the Small Intestine: A Roentgenologic and Clinical Study of Forty Cases, *J. A. M. A.* 104: 613-618 (Feb. 23) 1935.

9. Golden, Ross: The Small Intestine and Diarrhea, *Am. J. Roentgenol.* 36: 892-901 (Dec.) 1936.

of motility throughout the intestinal tract, and this is the more striking if the patient has been complaining of diarrhea. Peristaltic activity is definitely subdued, the contrast suspension making its difficult, slow way down the tract much as if it were being poured through a half-lifeless tube. Peculiar segmentation of the intestinal loops is commonly found. Contracted segments are observed to alternate irregularly with dilated ones. In another phase, a loop that was dilated is found to be contracted. The contours of well distended segments may be abnormally smooth at one period of roentgenoscopic observation, abnormally shaggy at another. The internal relief of involved loops may be markedly suppressed or markedly exaggerated. Fantastic agglomerations of the opaque suspension take place. In the normal small intestine the opaque suspension assumes a smooth homogeneous continuity; here part of it is collected in a pool in an isolated dilated segment, another part is clumped in an apparently unrelated amorphous mass, and the rest of it assumes the appearance of a flocculent precipitate throughout a long stretch of some other part of the small intestine. The changes are the more marked the more well defined is the clinical pic-

Starr and Gardner¹⁰ noted atrophy, dilatation and passive congestion of the entire intestinal tract; Whipple¹¹ described extensive deposits of neutral fat and fatty acids in the intestinal mucosa, with passive congestion and cloudy swelling of the viscera; in one of three cases reported by Blumgart¹² ileal ulceration, distention of the cecum and atrophy of its mucosa were noted. That



Fig. 6.—Meckel's diverticulum was diagnosed at roentgenologic examination. The patient had a marked secondary anemia and evidence of intestinal bleeding but refused to submit to operation. Left and right phases in the examination of the small intestine.

the intestinal secretions are grossly abnormal is evident from physical and chemical examination of the stools and intestinal secretions.

On the basis of my own observations I am inclined to discredit the importance of inflammatory changes, such as edema, ulceration and infiltration of the intestine, in the production of this roentgenologic syndrome. It seems to me that the roentgenologic changes are more plausibly explained by holding the degenerative changes accountable for the abnormal motility and for some of the bizarre intestinal patterns observed, while the abnormal secretions are made responsible for the other peculiar roentgenologic manifestations.

DIVERTICULA OF THE SMALL INTESTINE

Duodenum.—Diverticula are found in the duodenum more frequently than in any other part of the intestine except the sigmoid colon. The most common site of origin is near the ampulla of Vater. They may be single or multiple, very small or very large, but even when large they are usually symptomless. In rare instances they become large enough to produce symptoms of partial or intermittent obstruction mechanically, and in this event radical therapeutic measures may be necessary for relief. It is conceivable too that ulceration may result from prolonged retention of ingested matter, and symptoms may develop from such a situation. The diagnosis is strictly roentgenologic when made before operation or necropsy. Even when small, the characteristic extraluminal outpouching is readily recognized as the contrast meal is observed as it passes along the course of the duodenum after it has passed through the pylorus. Sometimes diverticula are distended with gas or with fluid or with both.

Jejunum.—The diverticula found in the jejunum are larger, as a rule, than those in the duodenum, and they are more frequently multiple than single. In the

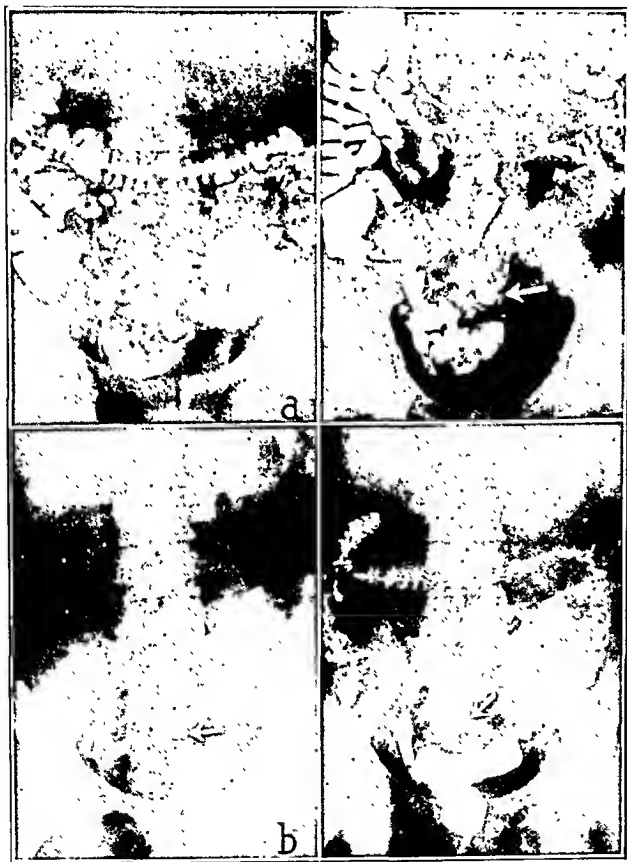


Fig. 5.—a, phases in the examination of the small intestine; left, the earlier phase shows no roentgenographic evidence of the diverticulum, although it was identified at roentgenoscopic examination; right, the arrow points to the diverticulum; b, left, the abdomen fifteen hours after administration of 2 ounces (60 cc.) of castor oil and twenty-four hours after patient took the contrast meal (a); the arrow points to the residue of the contrast suspension in the diverticulum; right, after evacuation of contrast enema.

ture, and the involved segments have a decided tendency to return to normal as the patient gives evidence of clinical improvement.

At the present time one can do little more than speculate about the morphologic and physiologic significance of these roentgenologic changes. In only a few cases were actual morphologic studies made available.

10. Starr, Paul, and Gardner, Lois: A Biochemical Study of Two Patients with a Condition Simulating Sprue, *Am. J. Trop. Med.* 10: 253-293 (July) 1930.

11. Whipple, G. H.: A Hitherto Undescribed Disease Characterized Anatomically by Deposits of Fat and Fatty Acids in the Intestinal and Mesenteric Lymphatic Tissues, *Bull. Johns Hopkins Hosp.* 18: 382-391 (Sept.) 1907.

12. Blumgart, H. L.: Three Fatal Cases of Malabsorption of Fat with Emaciation and Anemia, and in Two Acidosis and Tetany, *Arch. Int. Med.* 32: 113-128 (July) 1923.

jejunum, as in the duodenum, the diverticula are usually symptomless, although instances have been reported in which the diverticula were held responsible for symptoms such as borborygmi and intermittent cramps after the ingestion of food. The diagnosis of jejunal diverticula is likewise a roentgenologic problem. Since the outpouchings are usually large, they are recognized with comparative ease as the contrast meal makes its way through the jejunal coils. Frequently the diverticula fail to evacuate the contrast substance rapidly, and they are recognizable even after the jejunal lumen in the immediate vicinity has contracted and all but the smallest residue of the opaque substance has been expelled from the mucosal folds.

Ileum.—Diverticula are but rarely found in the ileum, and those not designated as Meckel's diverticula rarely are associated with clinical symptoms. The roentgenologic appearance of ileal diverticula is the same as that of diverticula in the duodenum and jejunum.

MECKEL'S DIVERTICULUM

This developmental anomaly occurs in about 2 per cent of the population, males predominating in a ratio of 2:1. It is always found somewhere in the first 5 feet (150 cm.) of ileum above the ileocecal valve. Almost any variation in size, shape and position may be encountered. Thus Dixon and Famiglietti¹³ and Goldstein and Cragg¹⁴ described a gigantic Meckel's diverticulum, 66 cm. in length, which was found in a girl aged 5 years. Often the diverticulum is simply a small, budlike projection from the ileal lumen.



Fig. 7.—Meckel's diverticulum and hyperplastic ileitis. The arrows point to the diverticulum; left, in the roentgenogram made after evacuation of the contrast enema; right, in the specimen removed by resection.

Pemberton and Stalker,¹⁵ reviewing twenty consecutive cases in which Meckel's diverticulum was encountered at operation, classified the cases into three groups: (1) those in which there were no symptoms, (2) those

in which there were symptoms of intestinal obstruction and (3) those in which there were symptoms of intestinal bleeding. Only eight of the twenty patients had symptoms believed to be due to the diverticulum; in the remaining twelve cases the diverticulum was discovered at the time laparotomy was performed for some other abdominal lesion.



Fig. 8.—Meckel's diverticulum; left, lower part of the ileum filled with contrast suspension administered by mouth; right, diagrammatic representation of the condition found at operation: A, Meckel's diverticulum; B, neck of diverticulum; C, narrowed ileum.

The clinical diagnosis of Meckel's diverticulum, even when the diverticulum is diseased, is notoriously difficult. However, the condition can frequently be suspected and a presumptive diagnosis made on the basis of exclusion of other possibilities. The roentgenologic examination assists in the diagnosis of Meckel's diverticulum in two ways: (1) by the actual demonstration of the diverticulum somewhere in the lowermost 150 cm. of the ileum; (2) failing this, by assisting in the exclusion of other intestinal lesions as causes of symptoms.

Very few successful attempts at demonstrating Meckel's diverticulum by roentgenologic methods have been recorded. Case¹⁶ was the first to demonstrate this anomaly, and many years elapsed before another instance was recorded in the roentgenologic literature. Then others, among them Pfahler,¹⁷ Allemann¹⁸ and Prévôt¹⁹ reported cases. Up to the present time Meckel's diverticula have been demonstrated roentgenologically on but six occasions at the Mayo Clinic. Since these diverticula vary so widely in their gross morphologic characteristics, a typical roentgenologic appearance is not to be described. The roentgenologic appearance may, however, be expected to reflect the morphologic contour of the particular diverticulum. A review of the cases seen at the Mayo Clinic and those reported in the literature shows that Meckel's diverticulum will usually be found in those coils of the lower part of the ileum that are situated near and somewhat to the right of the midline and at or near the level of the umbilicus. One of the six cases seen at the clinic was reported by Skinner and Walters,²⁰ and the preoperative roentgenologic diagnosis of Meckel's diverticulum (fig. 5 a and b) was confirmed at operation. In three cases in which the diagnosis was made, the

16. Case, J. T.: Jejuno-Ileal Diverticula, *Acta radiol.* 6:230-240, 1926.

17. Pfahler, G. E.: The Roentgenologic Diagnosis of Meckel's Diverticulum, *Surg., Gynec. & Obst.* 59:929-934 (Dec.) 1934.

18. Allemann, R.: Zur Diagnose und Therapie des chronisch-intermittierenden subtotalen Ileus, *Schweiz. med. Wchnschr.* 64:331-333 (April 14) 1934.

19. Prévôt, R.: Meckelsches Divertikel im Röntgenbild, *Röntgenpraxis* 8:397, 1936.

20. Skinner, I. C., and Walters, Waltman: Leiomyosarcoma of Meckel's Diverticulum, with Roentgenologic Demonstration of the Diverticulum: Report of a Case, *Proc. Staff Meet., Mayo Clin.* 14:102-107 (Feb. 15) 1939.

13. Dixon, C. F., and Famiglietti, E. V.: Gigantic Meckel's Diverticulum with Ulceration Producing Massive Hemorrhage: Report of Case, *Proc. Staff Meet., Mayo Clin.* 12:545-547 (Sept. 1) 1937.

14. Goldstein, Moe, and Cragg, R. W.: An Elongated Meckel's Diverticulum in a Child, *Am. J. Dis. Child.* 55:128-134 (Jan.) 1938.

15. Pemberton, J. deJ., and Stalker, L. K.: Meckel's Diverticulum: A Review of Twenty Cases with Report of Two Cases, *Surgery* 3:563-567 (April) 1938.

patients were not submitted to operation and hence the diagnosis has not been confirmed (fig. 6). One patient had extensive hyperplastic ileitis, which was recognized roentgenologically. The diverticulum was discovered in the resected portion of the intestine and a review of the roentgenograms after operation revealed the site of the diverticulum and its contours accurately (fig. 7). In the fifth case a preoperative diagnosis of perforating obstructing neoplasm of the ileum was made (fig. 8). At the primary operation the real nature of the lesion was not determined with certainty, but it seemed to be a narrow, annular tumor of the ileum associated with marked inflammation. Ileocolostomy was performed. At the second operation, which was performed twenty-five days later, it was found the inflammatory process had subsided, and the real nature of the lesion became apparent. It was a Meckel's diverticulum 3.5 cm. in diameter at its base and 7.5 cm. long; the anterior portion had become ulcerated. There was also considerable inflammation of the ileum on each side of the diverticulum. A review of the roentgenograms in the light of these surgical observations revealed that the true morphology was readily apparent but misinterpreted preoperatively.

As roentgenologic experience with the diagnosis of Meckel's diverticula accumulates, it seems reasonable to expect that the condition will be recognized more frequently at roentgenologic examination. Such Meckel's diverticula, however, as are small and communicate with the ileal lumen by a very wide neck will be recognized only with the greatest difficulty, and many of them will inevitably escape roentgenologic detection. Careful and painstaking examination of that part of the ileum in which this anomaly occurs will, I think, result in many more accurate diagnoses of this condition than have been recorded in the past.

EXTRINSIC PROCESSES

The small intestine seems to be co-involved by pathologic processes extrinsic to it with relatively greater frequency than is the large intestine. Usually such processes are neoplasms which deform the small intestine segmentally either by direct extension and invasion or by producing trophic ulceration which extends into the lumen. Neoplasms of the pancreas seem especially prone to do this, but tumors of the mesentery and of the female pelvic organs may act similarly. Of the extra-enteral non-neoplastic processes which extend to and involve the small intestine, perforating diverticulitis of the sigmoid colon and salpingo-oophoritis seem to be encountered most frequently. The roentgenologic evidence of the extrinsic nature of the process is obtainable at the roentgenoscopic examination, if at all; palpation will possibly reveal the extrinsic mass or a more diffuse tenderness or muscular rigidity than would be expected if the disease were confined to the intestine. If actual perforation into the intestinal lumen has not taken place, considerable deformity of the affected segment may be observed, yet as the mucosal surface is carefully examined it will be noted that the mucosal pattern, although altered considerably by functional changes and by edema and submucous infiltration, will be left unbroken throughout the deformed segment. Conditions of this kind, however, may be very confusing and will often demand fullest cooperation of all special diagnostic services if the correct diagnosis is to be made preoperatively. Fortunately, situations of this kind are not commonly encountered.

CLINICAL ASPECTS OF CHRONIC DISORDERS OF THE SMALL INTESTINE

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BOSTON

This study has been restricted to the role of the small intestine in the etiology of chronic abdominal disorders and to the considerations that must be given it in the diagnosis of chronic digestive complaints.

Clinical signs and symptoms of disorders of the small intestine arise as a result of interference with the physiologic functions of digestion, absorption and motility.

SYMPTOMATOLOGY OF DISEASE OF SMALL INTESTINE

There are few symptoms which are highly diagnostic of disease of the small intestine. Obstructive lesions may cause vague prodromal symptoms such as a sense



Fig. 1 (case 1).—Appearance of the abdomen during an acute attack of intermittent intestinal obstruction caused by postoperative adhesions. Barium series during symptom-free intervals were negative. The large gas bubble in the left upper quadrant is in a dilated loop of jejunum.

of fulness or cramplike pain after meals, but the almost completely fluid nature of the content of the small intestine makes for an "all or none" type of obstruction. There is no obstruction until suddenly there is complete obstruction with an acute onset of symptoms that are either persistent or intermittent, depending on the mechanical status of the point involved.

Hypermotility of the small intestine produces symptoms that are less dramatic and more subtle in character. Abdominal distress immediately after meals, flatulence and diarrhea are suggestive of hypermotility. Grossly inadequate absorption results in large, foul, fatty stools, failing nutrition, calcium imbalance and avitaminosis.

Anemia is not uncommon in disorders of the small intestine and is the result of inadequate absorption of

From the Department of Gastro-Enterology, the Lahey Clinic. Read before the joint meeting of the Section on Gastro-Enterology and Proctology and the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

iron or other blood forming substance or more commonly the result of chronic blood loss. Gross hemorrhage also occurs and the passage of a large amount of red blood by rectum points to a possible lesion in the jejunum or ileum.

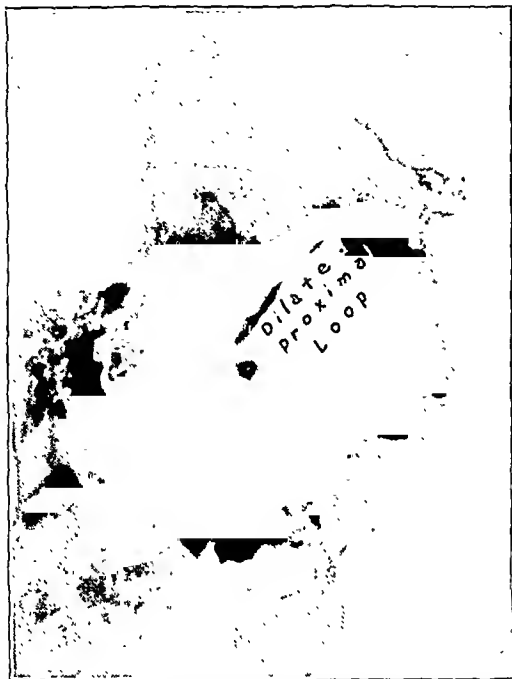


Fig. 2 (case 2).—Partial obstruction and marked dilatation of the jejunum caused by adhesions and a malfunctioning gastro-enterostomy from torsion of the jejunal loop, five hours after the ingestion of barium sulfate.

PHYSICAL SIGNS

The general physical signs of disease of the small intestine are malnutrition, anemia and signs of vitamin deficiency. Inspection of the abdomen may disclose an

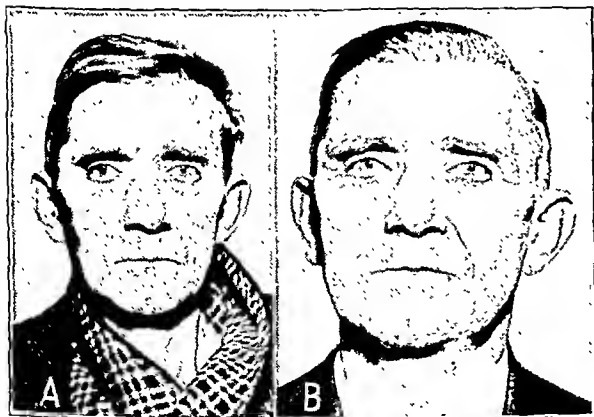


Fig. 3 (case 2).—A, appearance of patient Jan. 14, 1938, showing the malnutrition and the mental apathy which were present. Weight, 104 pounds (47 Kg.). B, appearance May 19 showing the striking change in his appearance after surgical relief of the obstruction and the associated improvement in his nutrition. Weight, 144 pounds (65 Kg.).

irregular pattern of dilated small intestine with or without visible peristalsis. If the abdominal wall is thin, it is usually possible to distinguish distended loops of small intestine from the stomach or the colon by the characteristic pattern and the type of peristaltic activity.

The other important abdominal finding may be a mass. Benign and malignant neoplasms of the jejunum or ileum vary in size, feel rounded and are usually movable and somewhat tender. An intussuscepted mass is firm but soft and gives the impression of being elongated or sausage shaped. Infectious granulomas may also be elongated but are harder and more ropelike.

ROENTGENOLOGIC SIGNS

By far the most important single laboratory procedure is the x-ray examination of the gastrointestinal tract, yet a remarkably large percentage of lesions of the small intestine are missed in the ordinary routine study. Although the study of motility of the small intestine, outline and mucosal pattern with serial films is well known and the interpretation well appreciated by specialists in roentgenology, these methods are not generally applied in gastrointestinal diagnosis, and the small intestine remains the relative blind spot in x-ray



Fig. 4 (case 3).—Rigid annular constriction with a sharp line of demarcation between rigid bowel wall and distended intestine, three hours after the ingestion of barium sulfate. Diagnosis, annular carcinoma of the jejunum.

diagnosis of the digestive tract. There follows the axiom that lesions of the small intestine are not found unless they are looked for.

There are practical objections, especially the cost of films, to the routine employment of numerous serial films in every case, and a compromise may be effected in the form of a film taken between two and three hours after the barium meal. Since, in the average case, the head of the meal reaches the cecum at this time, a considerable portion of the jejunum and ileum is well outlined and the film has much more diagnostic value than the ordinary six hour film. The examiner should be familiar with the clinical history and alert for symptoms pointing to the small intestine so that additional films can be ordered in suspicious cases. The rather wide variations in the normal mucosal patterns and outlines of the small intestine introduce difficulties in interpretation, but long experience in viewing normal patterns sensitizes the examiner to the occasional abnormal appearing loop.

Intubation of the small intestine combined with x-ray studies with air and opaque mediums recently described by Miller, Abbott and Johnston¹ promises to add further diagnostic aid.



Fig. 5 (case 5).—Stasis and dilatation of the ileum and a rounded filling defect within the lumen of the ileum produced by intussusception, three hours after a barium sulfate meal.

CHRONIC OBSTRUCTION DUE TO ADHESIONS

One of the commonest forms of chronic organic disorders of the small intestine is the intermittent obstruction caused by postoperative adhesions.

In case 1 there was a history of a panhysterectomy and appendectomy performed fourteen years before



Fig. 6 (case 6).—Abnormal x-ray appearance of the jejunum characterized by exaggerated markings and sharply serrated borders. The ileum is smooth and dilated with spastic areas. Diagnosis, chronic nonulcerative enteritis.

admission. About nine years later the patient began to have attacks of severe, cramplike pain in the lower part of the abdomen, occurring at intervals of from one

to twelve weeks, lasting several hours and sometimes accompanied by vomiting. Between attacks she had no important gastrointestinal symptoms. Characteristic of this condition, not only her physical examination but the gastrointestinal x-ray films were entirely negative during these intervals. Fortunately, while the patient was under observation she experienced a typical attack, which made it possible to make an x-ray examination of the abdomen during an attack (a diagnostic opportunity which should never be overlooked) (fig. 1). This disclosed a dilated, gas-filled loop of small intestine indicating obstruction, which was confirmed at laparotomy.

In association with chronic partial obstruction there is not only a disturbance of motility but sometimes a marked disorder of nutrition due to fear of eating



Fig. 7.—The normal small intestine may show considerable variation in position, caliber, outline and mucosal pattern. This film shows one of the common variations in the outline and mucosal pattern of the small intestine.

because of the resulting pain, frequent vomiting and diarrhea. Mild states of malnutrition and vitamin deficiency are common, and occasionally an extreme avitaminosis develops comparable to severe pellagra.

In case 2 a gastro-enterostomy had been performed for pyloric obstruction thirty-five years before admission. Until five years before the patient came to the clinic he had been well, but at that time he began to reduce his food intake gradually because of the abdominal pain that followed meals of ordinary size. His chief complaints on admission were neuritis in both legs and diarrhea. The physical manifestations were those of severe pellagra including emaciation, anemia, edema, polyneuritis, glossitis, dermatitis, proctitis and mental changes. Parenteral fluids and energetic vitamin therapy improved his condition, but an increase in the quantity of food resulted in obstructive vomiting. X-ray studies (fig. 2) showed obstruction of the proximal jejunal loop at the gastro-enterostomy, which proved to be due to adhesions and torsion of the loop. Surgical relief

1. Abbott, W. O., and Johnston, C. G.: Intubation Studies of the Human Small Intestine: A Nonsurgical Method of Treating, Localizing and Diagnosing the Nature of Obstructive Lesions, *Surg., Gynec. & Obst.* 66: 691-697 (April) 1938.

resulted in the patient's return to health. Figure 3 reveals the striking improvement in the patient's appearance. The nutritional disturbances had become so marked that in the clinical picture they overshadowed the gastrointestinal disorder responsible for the condition.

TUMORS OF THE SMALL INTESTINE

Benign and malignant tumors of the small intestine may cause obstruction which is progressive but may be steady or intermittent. An annular carcinoma of the small intestine characteristically tends to give rise to slowly progressive obstruction with increasing pain and vomiting. The loss of weight in this type of case is usually marked and rapid. The stools contain occult blood and there is anemia as a rule. Figure 4 demonstrates a typical annular, constricting filling defect of a carcinoma in the jejunum with dilatation and stasis above it. Surgical resection in this case was followed by recovery, and the patient is alive seven years after the operation.

New growths of the small intestine which are not annular in structure but are mural or polypoid in type are the most frequent cause of intussusception in the adult and are prone to cause intermittent attacks of obstruction similar to the attacks associated with post-operative adhesions. The attacks tend to become progressively more frequent and more severe. As in the cases of chronic adhesions, the x-ray examination may be disappointing except when carried out either during or immediately after an acute attack.



Fig. 8 (case 7).—Distortion of the outline and mucosal pattern of the duodenum beginning in the second portion with extension of the process into the jejunum producing changes in the outline and mucosa. The process extends well down into the jejunum, but the lower part of the jejunum is almost normal in the mucosal pattern, indicating that the inflammation was limited to the duodenum and upper part of the jejunum. Diagnosis, ulcerative enteritis.

DIVERTICULA OF THE SMALL INTESTINE

Meckel's diverticulum is another important cause of intussusception in young adults. The mechanism is probably identical, since in most cases there is in relation to the diverticulum either an inflammatory mass or a small benign tumor.

Occasionally it is possible to demonstrate an intussusception of the ileum by x-ray examination, as illustrated

by the following case: A man aged 34 had intermittent spells of cramplike, midabdominal pain for over a year. Films of the small intestine showed not only disturbed motility but the presence of gas and barium, which outlined the filling defect caused by the tumor of intussuscepted bowel (fig. 5).



Fig. 9 (case 8).—Changes in the outline and pattern of the mucosa of the upper part of the jejunum one hour after the ingestion of barium sulfate. The lower part of the jejunum and the upper part of the ileum show contraction and rigidity over an extensive area. Dilatation and saccululation of the lower part of the ileum are present. Diagnosis, chronic ulcerative and cicatricial enteritis.

Also in cases of bleeding from the lower portion of the intestine, particularly in children and young adults, Meckel's diverticulum should be considered, since the occurrence of aberrant gastric mucosa within the sac giving rise to peptic ulceration, hemorrhage and perforation is a well known clinical entity.

CHRONIC INFLAMMATORY DISEASE

Our knowledge of chronic inflammatory disease of the small intestine other than tuberculosis dates mainly from the report of Crohn² in 1932.

SUBACUTE OR CHRONIC NONULCERATIVE ENTERITIS

A subacute or chronic nonulcerative inflammation of the small intestine is frequently seen and is illustrated by a school boy aged 15 who had complained of malaise, anorexia, mild abdominal distress, mild diarrhea, a slight elevation of temperature and moderate leukocytosis for three months. The colon was normal by x-ray and by sigmoidoscopic examination, but definite changes in the mucosal pattern of the small intestine were demonstrated (fig. 6). There was no blood in the stools. Following treatment the symptoms disappeared and subsequent x-ray films showed a return to normal of the pattern of the small intestine.

CHRONIC ULCERATIVE ENTERITIS

The following case of chronic ulcerative enteritis is an example of a more severe and more chronic form of active inflammatory disease of the small intestine showing evidence of ulceration of the mucosa but with-

2. Crohn, B. B.; Ginzburg, Leon, and Oppenheimer, G. D.: Regional Ileitis. *J. A. M. A.* 99: 1323-1329 (Oct. 15) 1932.

out extensive hyperplastic reaction: A married woman aged 31 had complained of chronic abdominal pain for eighteen months. On examination she was found to have fever, a moderately severe anemia, mild leukocytosis and occult blood in the stools. Gastrointestinal



Fig. 10 (case 9).—Changes in the mucosal pattern of the jejunum and markedly irregular coils of ileum with numerous crater-like depressions in the outline one hour after the ingestion of barium sulfate. Diagnosis, chronic regional ulcerative and cicatricial ileitis.

x-ray examinations showed changes in the mucosal pattern, irregularities in outline and in caliber and some loss of flexibility in certain areas of the upper portion of the small intestine. The rest of the tract was normal (fig. 8).

HYPERPLASTIC STAGE

The hyperplastic stage is more chronic and may show surprisingly extensive involvement of the small bowel. The case illustrated in figure 9 shows x-ray changes throughout the small intestine which are highly reminiscent of the changes found in the colon in extensive ulcerative colitis.

From a roentgenologic point of view, chronic ulcerative enteritis of either the small or the large bowel produces obliteration of normal outlines, loss of flexibility, shortening of loops, stenosis and contraction of the lumen and occasional fistula formation.

TUBERCULOUS ENTERITIS

Tuberculous enterocolitis produces changes in the ileum and proximal colon which, from a roentgenologic standpoint, are indistinguishable from nonspecific enteritis. Brown and Sampson³ pointed out that localized hyperirritability of the intestine was indicative of early ulcerative lesions in the mucosa. As the process advances, changes in the mucosal pattern, irregularities of outline and lumen and finally rigidity and narrowing are demonstrable by x-ray examination. Since it is generally accepted that ileocecal tuberculosis practically never occurs except secondarily to active, open pulmonary disease, the differential diagnosis is not a common problem.

3. Brown, Lawrason, and Sampson, H. L.: *Intestinal Tuberculosis*, Philadelphia, Lea & Febiger, 1926.

INTESTINAL CHANGES IN DEFICIENCY STATES

While malnutrition and deficiency states are common results of organic disease of the small intestine, it is also true that avitaminosis may lead to secondary changes in the intestinal tract which are sufficiently definite to be demonstrated by x-ray study. Irregular distortions of the normal mucosal pattern, localized dilatation of the lumen and a tendency for the barium sulfate to form pockets in isolated loops are noted. These changes are thought to be produced by edema of the mucosa, disturbances in the motor activity and loss of tone in the intestinal muscle.

Figure 12 shows an example of small intestinal atony found in a young woman with chronic malnutrition.

FUNCTIONAL DISORDERS OF SMALL INTESTINE

Purely functional disorders of the small intestine are difficult to establish on a sound clinical and laboratory basis. Nevertheless, experience with functional indigestion leads to the belief that in some cases disturbances of the small intestine play a prominent role. This disorder is usually manifested by signs and symptoms of hypermotility.

In some cases of hypermotility of the small intestine the barium sulfate meal may reach the cecum in less than one hour, and the entire meal may pass into the colon in three or four hours. A sense of extreme fullness in the upper part of the abdomen immediately after a meal is rather characteristic of distress of the small intestine. An unusual amount of borborygmi and a sensation of motion and gnawing within the upper part of the abdomen noticed immediately after a meal is also

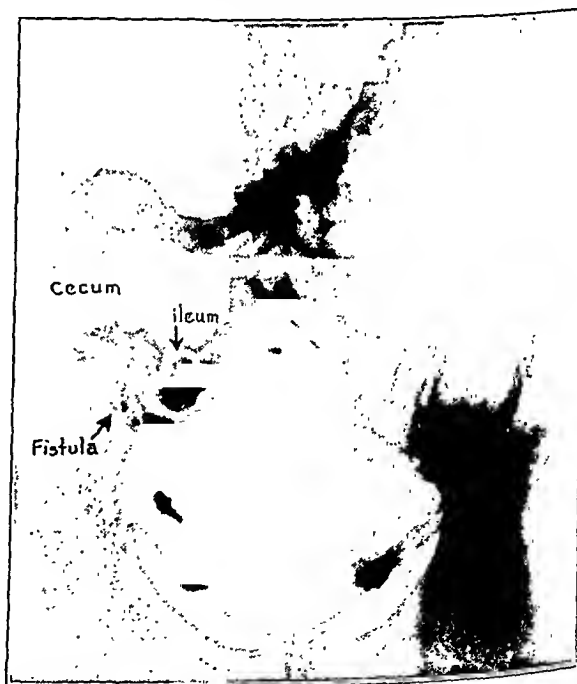


Fig. 11.—Contracted irregular lumen with loss of flexibility and sinus formation. Diagnosis, tuberculous granuloma of ileocecal region.

indicative of hypermotility. Rapid emptying of the small intestine may cause diarrhea and excessive flatulence.

Factors that are important in causing functional disorders of the small intestine are an irritating type of diet, habitual catharsis, alcohol, food idiosyncrasies or allergic phenomena, endocrine disorders, general fatigue and nervous or emotional factors. The excessive use of

cathartics is commonly associated clinically with disorders of the large bowel, but it is also true that cathartics have a pronounced effect on the small intestine. Patients with true food idiosyncrasies usually have a pronounced effect within a few minutes after ingesting the specific foods, and their symptoms often indicate a marked irritation of the small intestine.

SUMMARY

Chronic intermittent obstruction, most commonly caused by adhesions, is characterized by acute attacks of abdominal pain interspersed with asymptomatic



Fig. 12 (case 9).—Rapid filling of the small intestine and the dilated atonic appearance present throughout the jejunum and ileum one and a half hours after the ingestion of barium sulfate. Diagnosis, atony of intestine; malnutrition.

periods with negative physical and x-ray manifestations. Positive diagnosis is often made possible by roentgenograms taken during an attack.

In some cases nutritional disturbances may be the outstanding feature.

Annular tumors produce gradually increasing obstruction.

Mural and polypoid tumors cause intermittent attacks of intussusception which increase in severity and frequency.

Except for Meckel's diverticulum, diverticula are usually asymptomatic.

Tuberculous enteritis usually secondary to pulmonary tuberculosis rarely involves the ileum alone.

Chronic nonspecific enteritis may occur as a febrile condition with irritation of the small bowel, as an ulcerative enteritis with fever and anemia or as a granulomatous condition with thickening, obstruction and fistulas.

Functional disturbances are manifested by signs and symptoms of hypermotility.

X-ray diagnosis depends on signs of disturbed motility and changes in the outline, caliber, flexibility and mucosal patterns as illustrated by films taken at suitable intervals after a barium sulfate meal.

605 Commonwealth Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. CHAMBERLIN, WEBER AND KIEFER

DR. SARA M. JORDAN, Boston: The first striking thing which comes to attention is the need for more complete x-ray examination of the small intestine. We probably cannot, in all cases, do what Dr. Chamberlin and Dr. Weber so adequately outlined, but we can follow their example and use the fluoroscope at frequent intervals and take frequent films and use either their technic or a standard technic in each laboratory, so that we have something on which to base our judgment of the condition of the small bowel, and this especially in those cases in which there is any reasonable suspicion of disease in the small intestine. We can also adopt what Dr. Kiefer has shown to be a satisfactory routine method of making some estimate of the motility of the small intestine, by a film taken in two or three hours, in addition to one taken after the jejunum and ileum have been almost completely emptied. That simple addition to the routine procedure will help us in the acquisition of more knowledge of the small intestine. We do not have endoscopy for the small intestine, but we shall use, I am sure, the Osler-Abbott intubation. Peritoneoscopy, which Dr. Benedict has described, will also help in visualizing parts of the exterior of the small intestine. We are constantly going to have more and more help, but we shall still depend mostly on increased facilities and increased skill in the visualization of the small intestine through roentgenology. The second point which has been important in this group of papers is that we need constantly more and more security in our diagnosis of functional disease of the digestive tract. In the past when we have eliminated disease of the stomach, biliary tract and colon and have found no gross obstruction in the small intestine, we have said that the patient who complains of abdominal symptoms is probably neurotic. It is an age-old difficulty of internal medicine to separate the sheep from the goats, the neurotic from those with real organic disease. This new knowledge that we are finding of the small intestine will help do that. We shall be able to determine in addition to the functional disease of the colon and of the stomach, of which we have talked so much, definite indications of functional disease of the small intestine and probably in more cases we shall be able to find real organic disease. I should like to stress the fact which was emphasized by Dr. Weber, namely that repeated examinations are important.

DR. ROSS GOLDEN, New York: For years we complacently did our examinations of the stomach, the duodenum and the colon and didn't bother to look at the loops of small intestine which happened to be filled at the time of examination. At Presbyterian Hospital in New York we began to do a special examination of the small intestine ten years ago. The clinicians soon became convinced of its value and it has become a standard, frequently requested procedure. Our technic differs from that of Dr. Weber in that we use a smaller quantity of barium sulfate; namely, 2 ounces (60 Gm.) with the necessary water to enable a patient to take it. The smaller quantity is advisable because there is less danger of one loop obscuring another and, furthermore, we withhold food for at least five hours unless the barium reaches the cecum in a shorter time. There are three important indications for a special, small intestine which might be mentioned: (1) diarrhea, (2) bleeding and (3) persistent abdominal pain remaining unexplained after adequate examinations of the stomach and duodenum or of the large intestine have been done. This deficiency state is of unusual interest. The manifestations on the x-ray examinations are not specific. There are a number of different conditions which may produce those changes. Vitamin deficiency is probably the most important. The Abbott tube has been used at Presbyterian Hospital in from sixty to seventy cases. As a result the mortality in intestinal obstruction has been reduced to 7 per cent. We believe that the development of this tube is of major importance. Not only does it change the surgical operation from an emergency to an elective procedure but also it enables diagnoses to be made which would be extremely difficult any other way. I have never seen the

giving of barium sulfate produce any deleterious effects in the presence of disease of the small intestine. I should like to second what Dr. Kiefer said about the importance of examining the small intestine during an attack. Not infrequently I request the clinician to let us do the examination during an attack. I should like, furthermore, to emphasize Dr. Weber's remarks about the use of spot films with or without compression, particularly with compression. We have been able to show things in that way which would be very difficult to demonstrate by other methods, particularly in the terminal ileum. One interesting fact which came out in a study of the autopsy protocols of primary malignant disease of the intestine in our department of pathology was the frequency with which metastases in other parts of the gastrointestinal tract occur with carcinoma of the small intestine.

DR. W. EDWARD CHAMBERLAIN, Philadelphia: I too have found it necessary to examine the patient during the attack in order not to miss the diagnosis. In one case it took a third laparotomy to discover the lesion, which would have been missed the third time had it not been for the fact that the patient entered an attack while on the way to the operating room. There is one observation which I feel I should record here under the heading of motility changes of the intestinal tract. There is a type of human being who is subject to exaggerated constipation without abdominal distention and with relatively few symptoms until catharsis is indulged in. The bowel movements are markedly inspissated. That type of individual has invariably exhibited a strange hypermotility of the upper intestinal tract; in fact, in a number of cases repeatedly examined I have found that the head of the barium column is in the descending colon in approximately one hour from the time it passes the mouth. That is a definite hypermotility of the stomach, the small intestine and the colon, yet it occurs in individuals who will go perhaps seven or eight days, after the one hour of hypermotility, before they will discharge some of that barium from the rectum. I want to emphasize what Dr. Golden has said about the tremendous value of the Miller-Abbott tube in intestinal obstruction. We too have found our patients made comfortable. We are able to feed them and give them water and prepare them for operation in a perfectly spectacular way. We owe a great debt to those who created the Miller-Abbott tube and taught us how to examine the small intestine with x-rays.

DR. T. L. ALTHAUSEN, San Francisco: There are two points I should like to make in connection with the subject presented here this afternoon. One is to mention a method to prevent the excessive spread of barium through the small intestine during fluoroscopic examination, which is in use by the radiologists of the University of California Hospital and has not been mentioned today. It consists of passing a tube into the duodenum and injecting the desired amount of barium mixture through the tube. With this method the usual successive passages of barium through the pylorus are absent, resulting in more satisfactory examination of the small intestine. Even marked hypermotility of the intestine does not necessarily impair intestinal absorption. We unexpectedly found this in studying intestinal absorption by a test the description of which will appear shortly in the *American Journal of Digestive Diseases*. With this test, four of five patients in whom the head of the barium column at the six hour examination of a gastrointestinal series was seen at the splenic flexure of the colon or distal to it proved to have normal intestinal absorption.

DR. JOHN T. MURPHY, Toledo, Ohio: A number of the authors and discussers have used the term "spot" film and, as the men at this meeting are not all radiologists, I feel that it would be well to inject a word of caution about this procedure. When "spot" films are made at the fluoroscope, it is necessary to "step" up the current so that the film may get an adequate exposure in a short time. This produces a marked increase in both the direct and the secondary radiation. Repeated too frequently, this exposure may cause harmful effects on the personnel in the fluoroscopic room.

DR. GEORGE W. CHAMBERLIN, Philadelphia: In the cases in which I have used a water barium meal I have found normal motility to be an hour and a half to three hours from the

stomach to the cecum, and the small intestine is completely empty in from five to seven hours. There are some patients who show variations in the normal motility. In some instances in which the motility is unusually rapid, we have considered the possibility of allergy. Dr. Jordan mentioned the functional disturbances of the small intestine. This is the field that I have been particularly interested in and one of the reasons why I have urged every one to recognize a normal appearance of the roentgen pattern in the small intestine. There is evidence that such conditions as hypothyroidism and hyperthyroidism, adenomas of the pituitary, disturbances in the chemistry of the blood and other conditions outside the abdomen may produce an abnormal roentgen appearance of the small intestine. I should like to disillusion those of you who are gastroenterologists concerning what Dr. Kiefer said about the cost of the examination, particularly about the cost of the film. In our department we feel that the film is the least expensive part of the roentgen examination. In other words, adequate fluoroscopic and radiographic examination of the small intestine is possible if the radiologist will take the time to do a complete examination.

DR. HARRY M. WEBER, Rochester, Minn.: Meeting as we are with the Section on Gastro-Enterology and Proctology with whom our professional associations are very intimate, I think that they should have the assurance of the members of the Section on Radiology that we are continuing to lend our best efforts to what Dr. Jordan has aptly called "separating the sheep from the goats." In other words, we consider it our first duty to separate that group of patients who have organic disease as the basis of their symptoms from a much larger group whose symptoms are to be explained in another way. It has been said that in the past this has not been done very efficiently in cases of disease of the small intestine. Discussions of this type, together with more diligent application of roentgenologic methods to the small intestine, will do much to make the management of diseases of this division of the alimentary tract more satisfactory. Dr. Chamberlin emphasized that it means a lot of hard work—hard work, of course, for the roentgenologic examiner, which means first of all more diligent and more frequent use of the roentgenoscopic method in this field. None of us today consider the examination of the stomach or the colon adequately done without roentgenoscopic examination. Why then should the small intestine, the most difficult of all divisions of the alimentary tract to examine roentgenologically, be exempted from this the most useful and illuminating of all roentgenologic maneuvers?

DR. DAVID ADLERSBERG, New York: We all welcome the fact that we are beginning to think in terms of the small intestine. In regard to the interesting work of Dr. Kiefer, it is also my feeling that many of the complaints after gastroenterostomy and resection are due to disturbances in the small intestine. Some of these cases resemble mild cases of pellagra and sprue. As to the remarks of Dr. Chamberlin, I am also interested in cases in which there are hypermotility of the small intestine and colonic hypomotility, and have felt that in some of these cases the latter may be considered a compensatory mechanism for the former.

Inherited Structural Defects.—Most apparent of the human "abnormalities," by their very nature, are those which affect external appearance or sensory functions. At circus sideshows you can see some of the more startling examples of "black" gene caprice—midgets, dwarfs with misshapen heads and bodies, Negro albinos, "India-rubber" men, etc. But for each one of these there are dozens of other surface or structural defects found in the everyday walks of life. In fact, it may be said that most persons have some inherited structural abnormality—if we include, as "abnormal," conditions that are unusual, but not necessarily harmful or defective. Going further, and taking into consideration "hidden" recessive genes which singly produce no effect, it is pretty certain that every one of us is carrying some one or another of these genes.—Scheinfeld, Amram: You and Heredity, New York, Frederick A. Stokes Company, 1939.

THE RESPONSIBILITY OF THE MEDICAL PROFESSION IN THE MOVEMENT FOR 'BIRTH CONTROL'

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The avoidance of conception as a result of normal sexual intercourse has been made in recent years the subject of extensive scientific study as well as of propaganda movements directed largely by lay and, in part, by professional groups. The desirability of birth control in a limited medical sense has been extended into the realms of sociology, economics and eugenics, and as a result a considerable confusion of thought and purpose has been developed. The doctor, however, has been made to feel that his participation in the world-wide discussion is a minor one; he is accused of failing to keep in step with modern requirements and to be unwilling to support a movement of such paramount importance. Undoubtedly the medical profession has been hesitant to take an active part in a propaganda with which many of its members are out of sympathy, largely because of the hysteria and exaggeration which have accompanied its dissemination. However, it must be evident that the profession cannot refuse to recognize the firm conviction on the part of the public that procreation can, and perhaps should, be regulated.

As physicians, we should constitute an active and influential force by which this effort can be guided in the proper direction. How shall this be accomplished? Is it for the medical profession to propose means and methods or shall it all be left to chance? It should be possible to view the problem from its various angles and to formulate certain standards of thought and practice through which at least a partial solution of a difficult question may be reached. In other words, and speaking broadly, there is a sane as well as what may be termed an insane approach to a question which is agitating a great many people. Moreover it becomes necessary to define as nearly as we can the responsibility of the medical profession and what its part must be in the application of knowledge thus far available. This may not prove a simple task, but it is one which cannot well be evaded or shirked. Mere blind opposition will accomplish nothing and will only react to its detriment. It is essential therefore that in our discussion we consider the problem from its varying aspects: historical, social, economic, legal and medical. Full consideration of all these is necessary to a proper understanding of this complex situation. For the control of conception is not a simple matter if we reflect on its wider implications, some of which are already becoming evident, among them the effect on our population balance. It is essential therefore that not only the medical profession but the public at large be thoroughly informed on the subject and that reason take the place of hysteria and unreason.

EARLY EFFORTS

Man has attempted to control his procreative powers probably since the dawn of history, and the actual limitation of the family by direct means was sought as soon as civilization as such became manifest. It is interesting to read of the crude methods employed by primitive races and the survival of some of these up to the present by people supposedly of a higher degree of

intelligence. A knowledge of the physiology of impregnation was and still is an unknown quantity to most, but it is of interest to note in many instances that the methods for avoiding it were fairly ingenious and successful and, if not, there was always at hand a resort to abortion or infanticide. Strangely enough, with all these efforts to avoid conception there went almost hand in hand a desire to relieve infertility in women by procedures quite as thoughtful as the reverse. The responsibility for undesired pregnancy was not invariably placed on the woman's shoulders, and we find that mutilating operations were practiced on men for the same purpose by various primitive people who were evidently aware of the function of the seminal fluid.

As civilization advanced, crude methods and mechanical devices became gradually displaced by more rational procedures but, from a careful reading of the history of contraception, it is evident that the desire for prevention is not a new thing; it is merely the search for and distribution of effective and harmless means of achieving this which characterizes the later day movement. However, during the nineteenth century we find a noteworthy departure. From a purely personal basis, contraception in the larger sense became involved with social and economic problems. Woman's emancipation, so called, has served to stimulate her self expression. She demands what she terms protection against undesired or too frequent child bearing, and this attitude has extended to all social levels; the underprivileged classes are no longer to be discriminated against.

BIRTH CONTROL IN ENGLAND

Himes¹ accords to Francis Place, an Englishman who lived from 1771 to 1854, the same position in social education on contraception that Malthus holds in the history of overpopulation theories. Malthus had approached the problem of birth control from an entirely different standpoint, for he believed that unchecked population growth in a country would in time overreach its available food supply. He recommended moral restraint and essentially condemned birth control as we know it today. Moral restraint did not imply restriction in intercourse within the married relationship but rather postponement of marriage until the contracting parties were able to support possible offspring. It is readily seen why the more radical ideas of Place and his successors developed a larger following. Place made a strenuous campaign in England in 1822 and the subsequent years, circulating handbills freely among the working classes, describing the use of a vaginal sponge or coitus interruptus as effectual contraceptive methods. Place and his followers, although including medical conditions, made a strong plea for their devices as factors in preventing poverty and raising the standard of living of the masses. Place also argued that birth control would favor earlier marriages and that postponement led to vice and prostitution. Place was not a physician and he was not supported by the medical profession but he frequently sought the advice of its members. He did introduce the organizational element into the control of contraception, which has developed into the prominent propaganda movement that we know today.

After the clamor for social reform died down in England, following the general readjustment after the Napoleonic period, interest in birth control likewise diminished but found a new field of activity in America, where the publication of several books by Richard Owen

Read before the Section on Obstetrics and Gynecology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Himes, N. E.: *Medical History of Contraception*, Baltimore, Williams and Wilkins Company, 1936.

and Dr. Charles Knowlton, among others, served to revive the agitation. The latter recommended chiefly astringent douches after coitus, and his book "The Fruits of Philosophy" was widely sold in this country and in England.

During the last quarter of the nineteenth century, prosecution of several writers and publishers in England characterized the campaign for democratization of birth control knowledge by publicity. The Free Thought Movement of that period, under the dominance of Annie Besant, Bradlaugh and others, became involved in court procedures and in 1878, as the result of two jury trials, a sentence combining prison and fines was imposed on a Mr. Truelove, a book publisher of London. The public of England became intensely stirred, but the results of various appeals were unsuccessful, although the trials did aid finally in making legal the general free distribution of contraceptive knowledge. There seems to be little doubt, moreover, that the diffusion of birth control knowledge has reduced the English birth rate by half since 1876.

Mrs. Annie Besant brought out in 1884 a booklet entitled "Law of Population," which found general favor as shown by the fact that more than 175,000 copies were sold, the last edition appearing in 1897. Additional contraceptive devices, including the soluble suppository and the rubber cervical cap, were proposed. Another pamphlet, written however by a doctor, also appeared during this time and by 1927 its circulation had passed the half million mark. Its author, H. A. Allbutt, a Leeds physician and fellow of the Royal College of Physicians of Edinburgh, was accused in 1887 before the General Medical Council of having published an indecent book and his name was ordered taken from the Medical Register, mainly, it seems, because the author's conduct was considered unprofessional in permitting advertisements of contraceptives to be included. Appeals were unsuccessful as far as Allbutt was concerned, but his pamphlet continued to circulate widely.

Various individuals and organizations too numerous to mention have identified themselves with the birth control movement in England. Characteristic of more recent sentiment is the stress laid on birth control as a health and eugenics measure rather than as one solely dictated by economic status.

PROPAGANDA IN THE UNITED STATES

The birth control movement in the United States during the nineteenth century was associated rather closely with that in England. A number of physicians wrote similar books of advice and direction for married couples, but there developed likewise a good deal of quackery and also an association of the movement with certain erratic individuals who were active in a variety of religious and quasireligious cults and organizations. Liberal political thought, as expressed by socialists, communists and even anarchists, included birth control propaganda, and legal restrictions against the distribution of information and devices were incorporated in the laws dealing with obscenity and indecency in the federal Postal Code and in various state laws. An interesting social experiment of this time was the Oneida community of New York State, which existed for a period of years during the latter part of the nineteenth century. This was a voluntary communistic colony which was founded and led by John Humphrey Noyes and combined its peculiar religious doctrines of Perfectionism with a complex system of marriage in which control of conception was exercised by a peculiar type

of coitus, a sort of male continence. This colony constituted an interesting eugenic experiment but, its essential principle being unphysiologic and contrary to what Himes terms "the sexual pattern of the male developed over a long physiological period," it did not long survive. Moreover, internal dissensions and the force of public opinion assisted the disintegration.

Others took up the birth control propaganda in this country and many books had wide circulation notwithstanding the many prosecutions brought about through the Comstock laws. These legal restrictions centered in certain postal regulations and curbed for a considerable period the dissemination of birth control information and devices. Of course all sorts of evasions were practiced, but in the course of time legitimate medical indications became more clearly recognized. Teachers of prominence in medical schools talked about and approved of contraceptive measures yet for many years did little to advance the scientific side of the subject. In the early part of this century the name and personality of Margaret Sanger became prominent through her dramatic efforts in circulating literature and opening clinics for contraceptive advice. She came into conflict with the law, and her persecution by the police served merely to draw greater attention to her self-assumed martyrdom. Her attitude toward the subject may be regarded perhaps as exaggerated and often hysterical, but her influence was undoubted and she succeeded by her strength of will and determination in interesting and enlisting many well meaning and wealthy women for the support of the American Birth Control League and allied organizations. Mrs. Sanger claimed that from the first she attempted to operate through the medical profession but the unwillingness of its members to assist her forced her to independent action.

COMMERCIAL EXPLOITATION

It has been claimed (Himes,² p. 326) that the failure of the medical profession to accept its responsibilities is the principal cause for the extensive commercial and antisocial participation in the contraceptive movement. There can be no question of the enormous and highly profitable traffic in preventives—good and bad—sold widely everywhere at the present time without apparent restraint. One must carefully divorce the legitimate from the illegitimate demands in arriving at a conclusion about what should be done to restrain sales and secure standardization of products.

There is one aspect of the problem to which insufficient attention has been given by the profession, namely its responsibility in the teaching and practice of birth control measures when these are indicated. The history of the movement shows however that, particularly in recent years, physicians have given thought to the matter of judging the efficacy of various methods of contraception and have instituted scientific studies to evaluate them. Medical indications have also been more closely defined. But it must be acknowledged that the stimulus has come largely from lay groups whose sense of direction and application has not, as a rule, been satisfactorily guided. For much of this the doctor, both in an individual and in a collective capacity, must assume the blame. It should not have been necessary to establish extramural clinics for this purpose; whatever advice and treatment were necessary could have been done in the established hospital clinic and doctors' offices. Moreover, the assumed illegality of contraceptive advice has, in my belief, had an unfortunate psychologic effect, and the confusion that exists in the minds of physicians likewise requires clarification.

It is questionable whether the imposition of statutes, either state or federal, can control a movement of this kind, in which concerted agitation, largely by interested lay groups, has too often distorted and magnified indications. Medical men have given their names in aid of efforts to do away with restrictive laws, so that a physician's right to prescribe as he saw fit would not be invaded. There can be no question about the paradoxical and absurd situation created by the retention of outmoded statutes, both federal and state, which have interfered with legitimate practice and contributed little to control the indiscriminate dissemination of contraceptive advice and products. The commercial exploitation that has resulted can be regarded only as disgraceful. In a recent magazine article the number of dollars involved is quoted in millions. An extensive and thriving business has been developed by a large number of manufacturers and distributors whose field of activity is by no means directed to those people legitimately entitled to employ their devices. The resultant advertising campaign has become nauseating and under the more acceptable and supposedly refined appellation of "feminine hygiene" an important and serious matter has become flouted for purposes of financial gain. We can thank the unrestrained popular propaganda for this, as we can for the lack of sexual restraint which has become so evident. There is a hope but, it must be admitted, a rather faint one, that through proper education and the possible help of the medical profession we may arrive at a more sane attitude toward this question.

THE COMMITTEE ON CONTRACEPTION

The American Medical Association long resisted efforts to give its official sanction to the study of contraception but finally, at a meeting of the House of Delegates held in Atlantic City in 1935, provided for a study committee, which has rendered two reports.² This action by organized medicine should be given careful consideration, and I want to review briefly the reports of the special committee which thoroughly discussed and studied the various claims that have been made concerning the need for contraceptive practices, as well as the accepted medical indications and the possible dangers associated with the widely disseminated propaganda. The committee approached the subject from various points of view, beginning with that dealing with overpopulation. This problem is very complicated and resolves itself today into a question of selected growth rather than a haphazard increase. If this means a wider acceptance of the need of contraceptive practice applied in particular to the unfit, using this term in a wide sense, the committee was hesitant to enter into an endorsement of such a movement because it felt that, as far as the United States or similar countries is concerned, we have as yet little to guide us in formulating a national policy on the subject. The committee also believed that it must limit its consideration of the question as it refers to the relationship of physician and patient. The committee called attention to the inadequacy or ineffectiveness of many contraceptive procedures and to the actual dangers of others. While clarification of laws is needed, there was no evidence that existing laws interfered with a physician who felt called on to give information to patients. The committee expressed its opposition to independent and unlicensed birth control clinics and suggested the need of instruction to medical students in the entire subject of fertility.

2. Report on the Use of Roentgen Rays for Contraception, Council's Committee on Contraception, J. A. M. A. 111:1767 (Nov. 5) 1938.

As for eugenic considerations, the committee concluded that there is little scientific basis to justify wider birth limitation except in the case of acknowledged transmissible congenital diseases. Moreover, there seems to be no evidence that a wider dissemination of contraceptive information would establish a better social and economic equilibrium in society. While family limitation among lower income groups might prove advantageous, the lack of adequate and effective methods makes this difficult, especially where the exercise of ordinary restraint is inapplicable.

Medical considerations naturally could be more appropriately discussed by a group of physicians and more definite conclusions could be presented. The committee recognized that voluntary limitation of conception may be necessary to safeguard the health of some women, as in the presence of active tuberculosis, nephritis, heart disease, certain psychopathic conditions, arteriosclerosis, chorea, pernicious anemia, a recent serious illness or operation and a number of other conditions, especially in women physically incapable.

A recommendation that a responsible group be authorized to develop standards for judging contraceptive materials was not endorsed until the year following the introduction of the first report, when it was referred to the appropriate councils of the Association. It was also reaffirmed that contraceptive information should be limited to physicians in their private practice and to regularly licensed clinics under medical supervision. This formal recognition of the subject by organized medicine constitutes an important step, but thus far no impression can be recorded on the status of the question as a whole. It will take years to curb and regulate a movement which has had such wide and appealing publicity.

RESULTS

I have attempted to review briefly the history of the birth control movement and its development in this country. While efforts to develop contraceptive practices are by no means new, the effects on our social structure have become more evident during recent decades, particularly the influence on birth rates and population balance. This influence cannot be disregarded, for we must face the fact that the birth rate of this country is diminishing and that the older age groups soon may dominate the younger. The former are outside of the productive and reproductive periods and it will take more time to determine the effect of such biologic interference on the economic and social status of a nation.

Much has been said about the influence of contraceptive practices and their free discussion on morals and a changing attitude toward parenthood and child bearing. This is a broad subject and its interest to the profession may be secondary, for undoubtedly the physician no longer occupies the position of adviser and family counselor which he did in the past. Nevertheless I feel that he has an important role to play, for it would have been well if he had chosen or had been chosen to carry out the practical application of a contraceptive program in a sane and reasonable manner. Organized medicine, speaking through its official body, has attempted to define this position but with what success remains to be seen. However, the individual physician may feel that he must be guided by conscience or religious precepts and it would be unwise in such instances to resort to persuasion in any effort to bring about a change of views. A considerable portion of the active practitioners of medicine acknowledge

and believe that contraception is justified and plays a part in their professional duties. It would appear reasonable, therefore, to review the practical phases of contraceptive therapeutics, if I may so designate them. Before doing so it may be well to discuss briefly the religious aspects of the question.

THE "SAFE PERIOD"

Many religious bodies have condemned severally interference by artificial means with the process of insemination, particularly the Catholic church, and yet we find apparently a change of sentiment in recent years, since fairly definite knowledge is available about the so-called safe period. While one must approach the subject with caution, it is evident that no condemnation by church authorities attaches to the practice of this method of contraception by married people. Prominent Catholic clergymen and physicians have endorsed and written about the availability of the "safe period." This view assumes, of course, that the time of ovulation can be determined absolutely in all cases. Unprejudiced medical opinion is somewhat less certain. While ovulation in most cases occurs during the middle of the intermenstrual month, a variety of physical and emotional factors may advance or postpone menstruation and thus throw calculations out of balance. This uncertainty is of particular moment in cases in which pregnancy is contraindicated for definite medical reasons.

The so-called Ogino-Knaus theory has stimulated a vast amount of clinical and biologic investigation. Undoubtedly there are women in whom a "safe period" exists, but in actual practice the procedure demands a degree of restraint and cooperation which cannot be relied on to do what is so glibly claimed for it. How can such a method of self control be imposed on that large group of people who most need a foolproof method of either child spacing or contraception? Mathematical calculations based on menstrual dates are scarcely reliable or opportune in moments of sexual excitement. It places too much of a strain on human nature.

THE DOCTOR'S QUANDARY

The doctor, assailed by conflicting opinions, naturally is in a quandary when consulted by patients in the legitimate practice of his profession. He is well aware of the consequences of pregnancy when this is contraindicated medically or in certain instances socially. Whatever his principles, he may find it necessary to sacrifice these to expediency. He may in consequence be damned if he does and equally damned if he does not. There must be a middle ground on which the physician may stand which is legitimate and yet not contrary to the just demands of his patients. Therefore, what advice and suggestion can we accept as practitioners for the practical application of contraceptive knowledge now available?

Numerous technical manuals on contraception have been published for the use of physicians which offer a multitude of methods. It is well in each instance to study the individual patient and adopt the most suitable procedure to the case. Passing by what may be termed physiologic methods such as continence and coitus interruptus (withdrawal), the commonly employed methods may be divided into chemical and mechanical.

METHODS IN USE

The principal chemical methods include the medicated douche and a variety of jellies, suppositories and foam powders. The douche is effective mechanically to a certain degree and may be rendered spermicidal by the addition of soap suds, a variety of astringents

(vinegar, alum and the like) or chemicals (mercury bichloride or saponated solution of cresol). The uncertainty of the former and the dangers of poisoning by the latter render this procedure undesirable in most instances. Jellies and pastes contain a variety of chemicals suspended in a water soluble vehicle to be injected by an appropriate device into the vaginal vault. Suppositories are solids melting at body heat, usually of gelatin or cocoa butter, incorporated with boric acid, chinisol, quinine or a similar drug. Foam tablets are stable in the absence of moisture and are made up of sodium bicarbonate and a solid acid such as tartaric or boric. They depend for their activity on producing a mechanical barrier at the cervical os, as well as on the spermicidal effect of the carbonic acid gas generated and the incorporated spermicide. A variety of powders for vaginal insufflation have also been employed.

These procedures depend largely for their effectiveness on the occlusion of the cervical opening, and the jelly is perhaps the most suitable. On the whole, however, they do not prove as highly effective as the actual occlusive pessary or the condom. Vaginal barriers can be made out of soft absorbent materials such as wool tampons or sponges, saturated perhaps with vinegar or some chemical solution or made from rubber in the form of a cervical cap or a diaphragm. The latter, supplemented with a jelly, is generally regarded as the most effective device and is widely used in contraceptive clinics, where it serves as the basis for the mystery which it is claimed is freely accessible to the rich and denied to the poor. The occlusive pessary must be carefully fitted to be effective, and the necessary manipulations may prove offensive to some women, but evidently most of them have overcome any possible scruples.

The foregoing methods are limited to the woman and applied before each exposure. Prolonged protection has been sought in the form of a variety of intra-uterine devices as well as subjecting the ovaries or testes to irradiation. The injection of sperm to produce spermatoxins has also been made the subject of extended experiments. Intra-uterine stems and rings are mentioned merely to be condemned. Their dangers are so evident that they should never be employed, notwithstanding the claims made for them. The field for irradiation of the ovaries to produce either temporary or permanent sterility is too limited for general discussion and we have too little satisfactory or definite knowledge about spermatoxin to warrant its consideration in general practice.

METHOD USED BY THE MALE

The condom is perhaps the better known and more common contraceptive device for use by the male, and an enormous expansion of its manufacture and distribution has taken place in recent years in this country. Of its use and safety there can be but little question. However, popular contraceptive propaganda has been directed largely to the woman, who is made the responsible partner. I wonder whether the various agitator groups would have been so successful in their appeals for sympathy if the responsibility for taking contraceptive measures had been lodged primarily in the male?

Complete sterilization of either man or woman by ligating the seminal tubes or the oviducts is somewhat out of the province of this discussion, but there is a growing sentiment that vasectomy in particular should not be limited to the mentally defective.

The relative value of the various methods thus briefly outlined is based on their efficacy and comparative harm-

lessness. It is in this field that authoritative and unprejudiced information is needed, and we may hope that an official body, preferably medical, may in time promulgate the desired knowledge. Extended studies have been made by the special birth control organizations and others, but little has been made available to physicians through official publications. The choice of method depends on the particular indication and the particular patient and also on whether contraception shall be temporary or permanent. Certain medical indications are distinct and perhaps permanent, certain social indications may verge closely on the medical and perhaps be only temporary. I have already referred to the group of transmissible diseases. Fortunately they are not numerous and in many instances the pathologic condition itself may constitute a barrier to pregnancy. When organic disease is present, including disorders of the heart, lungs, kidneys or blood forming organs, a physician need not hesitate; but there is another group of cases in which merely a state of overfertility may come into the question.

Fertility among individuals varies greatly and is dependent on a number of factors. Frequent child bearing, aside from its social and economic aspects, may have a decidedly depleting and perhaps harmful effect on a woman's general health and well-being. No one would deny the desirability of properly spaced pregnancies or even a reasonable number of children in order to avoid the drain on a woman's physical resources, which have had added to them so many other demands in more recent years. We cannot measure today a mother's ability to bear children by the standards of the past or by the much heralded occasional large families so dramatically shown on the screen or the Sunday supplements of our daily papers. The economic value of large families to factory workers and farmers is doubtful in this present day and age, and changing social and housing conditions call for a changed point of view. Unfortunately we have gone back a little too far in the popular estimate of the size of the family which, as far as the number of children is concerned, has gradually drifted to a point where a population balance is no longer being maintained. The physician, however, is often drawn into the picture, and his advice is sought by harassed parents who may not have found their way to a convenient birth control clinic where no embarrassing questions are asked. What shall he do? If truly acquainted with the facts, he should not hesitate to take the steps necessary for the welfare of that particular patient, provided he knows what to do and how to do it. Continence seems to be out of the question as a remedial agent in most cases; he cannot control nature's urge and he would get little encouragement or cooperation if he attempted to do so.

It is difficult to make a rule for the proper spacing of children, but an interim period of not less than two years should prove a desirable physiologic reply to this question. This brings up the consideration of the problem of postponing the first pregnancy in a young married couple. The universal dissemination of the birth control propaganda has fixed quite firmly in the minds of many people that such postponement until a convenient or suitable time is a perfectly legitimate and proper desire for a variety of good, or at least apparently good, reasons. What with our already late marriages, this has increased the average age at which the first labor takes place with a consequent increase in possible abnormalities, including a demonstrable higher incidence of toxemia and operative intervention with

its attendant morbidity and mortality. Undoubtedly a great many instances of sterility are covered up by the use of contraceptives which might have been discovered and treated at an earlier period. Moreover, the psychologic effect of avoiding pregnancy in the earlier years of married life is, in my belief, inherently unfortunate because it makes of this perfectly normal function an undesired complication, in many instances to be accepted finally if it cannot be avoided. It is true there may be extenuating circumstances in individual cases, but accepting contraception as a first stage in marriage is contrary to sense and to reason. It takes from possible parenthood that aspect of dignity and desirability which contributes much to connubial happiness.

MATERNAL MORTALITY

There is one further aspect to this problem to which I want to call attention. We have heard much in recent years about the high mortality associated with child bearing in the United States—that six women die out of every thousand who give birth to a living child. Ignorance, neglect and lack of proper and adequate care have been ascribed as causes, and constant efforts are being made by the medical profession and interested lay groups to reduce the preventable deaths, which are calculated as about one third or more of the total number. Is it possible that a knowledge of these facts has made women fearful of pregnancy and thus stimulated a demand for contraceptive measures? And in this connection we must likewise think of the many abortions with their high toll of death. If one half of the women who died from preventable causes and a like number of babies who were stillborn or who were lost as the result of abortions could have been saved, we might have less need to worry about our declining population. We are told that a wider resort to contraceptives would avoid these needless deaths of mothers and that legalized abortions, if contraceptives failed, are indicated in undesired pregnancies. It seems to me that this constitutes an illogical manner of thinking. We should be grateful for the fertile women and preserve their function, not inhibit or destroy it. Pregnancy must be made safer, it must not be regarded as either an unfortunate accident or a disease, and the increased resort to contraceptives is not the answer to the problems of maternity. The procreative instinct must not be stilled; our young women should be encouraged to develop and not to hamper it.

PHILOSOPHIC BASIS

The wider use of contraceptives is not apparently bringing about that unalloyed state of bliss which certain groups and individuals have promised. Doctors have been looked on as obstructionists to progress in this matter. But we are not obstructionists, we are merely doubters. There has been much sentimental appeal and much loose thinking on this subject and, notwithstanding all that has been said, we are still far from a satisfactory solution of the question of whether conception can be completely or satisfactorily controlled by artificial means. In the meantime the physician must play his part and assume his responsibilities. Whether he concludes to limit his participation to the strictly medical indications for contraceptive advice or whether he is ready to acknowledge the desirability of spacing children or limiting their number when this is needed, he should inform himself of the necessary procedures and their proper application and look on this knowledge as a part of his therapeutic armamentarium. If he declines to do so because of inherent principles or

religious beliefs, that is a matter for his own conscience and for which he should not be condemned.

I feel that too much attention has been centered on the mechanics of birth control and too little on the underlying philosophy which should govern its application. It would be preferable to have the physician consider the points of view of the eugenicist, the biologist, the economist and the student of population rather than the so frequently hysterical "contraceptive propagandist." It can hardly be expected that the practicing physician will familiarize himself sufficiently with all the varied factors in the problem, but he should be prepared to evaluate and carry out whatever procedures are necessary as an essential part of his practice. He is a participant in other fields which have a bearing on public health, why not in one of an import equal to that dealing with the prevention of communicable and other diseases? In the handling of a patient afflicted with tuberculosis, syphilis, diphtheria, pneumonia and other illness, he not only administers the remedy but in doing so he must observe the relation of this patient to the community. A similar point of view may be applied to contraceptive measures. There are definite indications for their employment in the presence of disease which have been satisfactorily formulated, but how and when and where to employ them is not at the present time a matter of general medical knowledge, and there is a prevalent hesitancy throughout the profession to make use of whatever knowledge we do possess. It would appear incumbent for medical schools to give such instruction, including not merely a demonstration of means and methods but to implant in the student's mind the wider implications of these practices which should be a part of a physician's armamentarium.

It is frequently claimed that economic and social conditions are the underlying reasons for family limitation. However, if this were true we would not find the procedure so widely practiced among those who may be designated as belonging to the middle and higher income groups. No, we must look elsewhere for such reasons and among the latter must be included the influence of what I myself regard as a vicious propaganda movement, developed and continued by false sentiment and inadequate reasoning. Physicians as a group have failed to evaluate this fact or to have exerted their influence in its regulation. This is a problem committed to their early attention, so that a solution may be possible with benefit to those most concerned, namely the parents of the future.

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ABSTRACT OF DISCUSSION

DR. CHARLES E. GALLOWAY, Evanston, Ill.: I agree with Dr. Kosmak that the medical profession has an important responsibility in the matter of birth control. I should like to mention two important factors: the first is that women do not find their chief sexual expression in sexual intercourse but in reproduction, and the second that we should teach the public the truth; namely, that according to our present knowledge there is no satisfactory method of birth control. Many women and most men are being led to think that a woman's sexual life should imitate that of a man, and our psychologists seem to be the chief source of this erroneous notion. Every erotic book is filled with this same idea. Women discuss the matter freely these days and come to their physician with the query "Why is intercourse not the same with me as with my husband?" The answer is, I suppose, "Why does your husband not have half the babies?" The supreme act of any woman's existence is reproduction and she will be healthier and more normally adjusted to her surroundings if she does reproduce a reasonable number of times. The majority of the women who consult

physicians today do not have need for their advice and it would be to their advantage if they were so occupied with the responsibilities of a growing family that they would not have time to become so introspective. The second great responsibility of our profession is to disseminate the truth that we really do not have any satisfactory means of preventing pregnancy. Too many of our profession are conducting birth control clinics and in other ways going before the people, telling them that, if a certain procedure is followed or a certain gadget used, intercourse will not result in conception. There is no gadget or procedure that does not fail a good percentage of the time and there is no time in the month when conception cannot take place. In my private practice I see an average of one patient who is pregnant against her will about every two weeks. She invariably comes with the story that she went to a birth control clinic or a doctor and was fitted with a diaphragm and told that by using it properly she would not conceive. I have also delivered at least ten so-called "rhythm" babies. I have seen the published statements of some of my colleagues maintaining that hundreds of diaphragms had been fitted without a failure, and you know that such a statement is not the truth. Therefore, our two chief responsibilities are, first, the dissemination of knowledge relative to the proper place of reproduction as regards the happiness and well being of women and, second, that the present methods of birth control are far from satisfactory.

DR. JOSEPH L. BAER, Chicago: I am convinced that those who seek information about family limitation and family spacing for whatever reason are entitled to get that information from their physician. The Council's Committee on Contraceptives of the American Medical Association hopes that clinical research of adequate quality will enable it to make recommendations within the next year. The public interest is directly concerned with the endless stream of newborn who by known medical criteria are reasonably certain to become public burdens. The legislatures which have sanctioned sterilization are far sighted and are serving the public interest. I believe that the influence of the American Medical Association should be directed toward furthering this method of control of an unfit population. I am equally convinced that the present wave of deliberate family limitation, based on the desire of the parents to have only as many children as they can rear and educate as they would like them to be reared and educated, will give way in due course to the normal desire and most parents to have more children than this present handicap seems to permit. Finally there is great anxiety lest the widespread dissemination of contraceptive information will undermine the morals of our youth. License and promiscuity are far more current today than they were a generation ago. This is observable in all walks of life. This is a problem of the home. Ethical values and morality must be instilled in children by their parents. It is my hope that the current wave of lax morals will eventually subside as our home life regains its stability and its recognition of the essential value of all the virtues. I should like to call attention to what I think was a most significant movement in this whole field. Last fall the Student Religious Association of the University of Michigan had a course of six lectures under the auspices of a combined faculty and student committee, the course being entitled "Marriage Relations." The lectures were characterized as follows by the committee: "In this series we wish to get away from sociological and philosophical platitudes and present the facts as they are in a frank and accurate manner, making the course as practical as possible." In my discussion I followed this outline: 1. The attitudes toward discussion of sexual problems are changing, from ignorance and tabu to a demand for accurate and sane information. 2. The large number of cases of marital maladjustment and divorce constitute a challenge. 3. It is necessary to replace many fears, tabus and superstitions surrounding the physiology of reproduction and sexual practice by scientific facts. 4. Marriage must be thoughtfully considered by college students, and the information obtained by specialists who have carefully and thoroughly studied married relations must be interpreted and frankly discussed. 5. The beauty of romance is not spoiled by true understanding; rather, intelligent appreciation of important factors of emotional and sexual problems will help prevent disillusionment afterward.

DR. FRED J. TAUSIG, St. Louis: It is difficult to dissociate the purely medical aspects of birth control from its socio-

economic environment. Yet as far as it is possible and practical it is our duty as physicians to do this. Let those who are concerned with problems of population growth, with economic want, with improper education and other social phases of an uncontrolled birth rate organize, discuss and take action on these matters. How far physicians may desire to cooperate in this movement is not our concern. We are concerned, however, in the medical phases of birth control, in the cases in which the proper spacing of children, the condition of the heart, kidneys and lungs of the mother present a contraindication to pregnancy for shorter or longer periods of time. Let us as physicians recognize that this is a matter that concerns every one of us regardless of creed. Some may advise one method, others may advise a different procedure, but we all recognize the cases in which a pregnancy presents a peril to the preservation of the family, and that in married life prolonged continence is not practical. Let us all get together and attack this problem scientifically. There must be other methods besides the so-called safe period that would be acceptable to those who do not approve of mechanical or chemical procedures. Intensive research as to better methods must be carried on by all groups. Some may approve one, some another method, but the advisability of preventing conception for shorter or longer periods to preserve the mother's health is an accepted fact.

DR. JOHN ZELL GASTON, Houston, Texas: The points that have been brought up here today bring out clearly the need for scientific information on contraception. There are three questions of vital interest, namely: 1. Is birth control effective? 2. What is the relationship between birth control and abortions? 3. Is birth control dangerous? At the Maternal Health Center of Houston in the past three years we have seen 2,635 cases, and in that length of time we have not found a single one in which scientific evidence can say that birth control has been harmful. Is birth control effective? We heard one of our discussers say that birth control was not effective and that reports were made of thousands of cases of failure. Here are our results. Of 2,500 women, we have had thirty-seven failures to date, or an efficiency of 98.5 per cent. What is the relation between abortion and contraception? The answer is a negative one, like the relationship of black to white, but we were curious to find out the frequency of abortions before contraception was used; hence a careful history was taken and we have the data to offer on a study of 2,069 case histories. We divided our cases into white, colored and Mexican groups. Of 1,002 white patients, 357 admitted one or more abortions before coming to the clinic. There was a total of 615 abortions in the 1,002 white patients, and one woman admitted fifteen abortions having been done on herself. In other words, 35 per cent of the white women had had abortions before applying to our clinic for birth control. The Negro patients show practically the same ratio: Of 730 Negroes, 211 admitted a total of 354 abortions. Mexican patients have almost exactly the same ratio; namely, of 337 Mexicans, 114 admitted on admission a total of 185 abortions. Birth control clinics do not condone abortions, and any statement to the contrary is not true. On the other hand, we teach that abortions are dangerous. The need for this teaching is brought out clearly by this study. If the figures we obtained are at all representative, the frequency of abortion the country over will reach a staggering figure. Of 2,069 white, Mexican and colored married women in the low income group, 682 admitted a total of 1,154 abortions before seeking advice on contraception. Therefore we need some scientific observations on this point to separate the dogma from the fact.

DR. GEORGE W. KOSMAK, New York: There is just one item to which I should like to refer; namely, the placing of the extramural clinics on a more satisfactory foundation. As far as I know there is no formal licensing of birth control clinics and in this country these operate more or less without the pale of the law. If this question is such an important one, I believe that the profession should recognize it to the extent of providing regularly licensed clinics in hospitals. There is no need, in my estimation, for separating clinics devoted to this particular part of the practice of medicine from those of any other, and it seems to me that one of the early steps in the movement to standardize this entire procedure is to provide for more hospital clinics so that they can be kept under control and definitely managed under medical auspices.

AN EPIDEMIC OF POLIOMYELITIS

IN WHICH BULBAR PARALYSIS OCCURRED
WITH UNUSUAL FREQUENCY

ERNEST L. STEBBINS, M.D.

EDWARD E. GILLICK, M.D.

NIAGARA FALLS, N. Y.

AND

HOLLIS S. INGRAHAM, M.D.

ALBANY, N. Y.

During the two months period from July 23 to Sept. 20, 1938, twenty cases of poliomyelitis occurred in the city of Niagara Falls. However, one of the cases occurred in a resident of an adjoining town who was a frequent visitor to Niagara Falls and had had a tonsillectomy performed in that city fourteen days before the onset of poliomyelitis. There was an unusually low incidence of poliomyelitis in New York State during 1938 and the epidemic character of the series of cases in Niagara Falls is shown clearly by a comparison of attack rates in that city with attack rates in the state as a whole and in adjoining areas (table 1). The most striking features of this outbreak were the large proportion of cases in which bulbar involvement was

TABLE 1.—Prevalence of Reported Poliomyelitis: New York State, Niagara Falls and Adjoining Areas, 1938

	Cases	Attack Rate
New York state.....	121	0.89
Niagara Falls city.....	19	23.37
Niagara county*.....	1	1.30
Erie county.....	3	0.81
Orleans county.....	0	....
Genesee county.....	1	2.17
Province of Ontario.....	103	4.6

* Exclusive of Niagara Falls city.

observed and the high fatality rate. In thirteen of the twenty cases definite bulbar paralysis was observed and twelve of these terminated fatally, a fatality rate of 60 per cent.

CLINICAL CHARACTERISTICS

The onset of the illness was in most instances characterized by mild gastrointestinal disturbance or evidence of mild infection of the upper respiratory tract, or both. In several cases there was a lapse of several days between the first indisposition and the onset of paralysis. In the majority, however, there was a sudden onset with rapidly progressive paralysis. Marked rigidity of the neck and of the spine was observed in almost every case. As shown in table 2, spinal fluid was obtained for examination in eleven of the twenty cases and moderately increased pressure was observed in all eleven. Cell counts of the spinal fluid varied from 17 to 450. An increase in globulin was reported in nine of the eleven specimens of spinal fluid.

Extensive peripheral paralysis was the usual finding, and only one nonparalytic case was observed, although diligent search was made for mild or abortive cases. In ten of the fatal cases peripheral paralysis was followed by a rapidly progressive bulbar paralysis with respiratory failure. In one case there was no evidence of peripheral paralysis, the first evidence of paralysis being difficulty in articulation. In another case bulbar and peripheral paralysis apparently occurred simultaneously. Table 3 shows the muscle groups involved, the classification of the cases according to the type of paralysis observed and the outcome of the case.

Because of the frequency of the bulbar type of paralysis, careful inquiry was made as to previous tonsillectomy or other operative procedure in the mouth, pharynx or nasopharynx. As seen in table 3, only four of the patients had ever undergone a tonsillectomy; two of these had had the tonsillectomy four and fourteen years previously. One had been tonsillectomized four

TABLE 2.—*Poliomyelitis in Niagara Falls, 1938*

Case Number	Sex	Age	Date of Onset	Tonsillectomy Date	Spinal Fluid	
					Cell Count	Globulin
1	♂	3 yrs.	7/23	None	54	+
2	♂	2 yrs.	7/27	None	20	+
3	♂	13 yrs.	8/7	April 1938	Not done	
4	♂	3 yrs.	8/9	July 26, 1938	70	+
5	♂	2 yrs.	8/11	None	Not done	
6	♂	5 mos.	8/20	None	Not done	
7	♂	8 mos.	8/22	None	50	+
8	♂	1 mos.	8/24	None	Not done	
9	♂	7 yrs.	8/27	None	60	+
10	♂	6 yrs.	8/29	1931	150	+
11	♂	8 yrs.	9/1	None	Not done	
12	♂	14 mos.	9/5	None	30	0
13	♂	8 yrs.	9/6	None	Not done	
14	♂	8 yrs.	9/7	None	Not done	
15	♂	18 yrs.	9/10	1921	130	+
16	♂	5 yrs.	9/12	None	Not done	
17	♂	21 yrs.	9/16	None	150	+
18	♂	11 mos.	9/17	None	17	+
19	♂	23 mos.	9/20	None	Not done	
20	♂	3 yrs.	9/20	None	122	0

months before the onset of poliomyelitis and one had had a tonsillectomy and adenoidectomy two weeks before the onset of poliomyelitis. No history of other operative procedures could be elicited.

ETIOLOGY

A portion of the cord and brain stem obtained at autopsy from patient 16 was sent to Dr. Charles Armstrong at the National Institute of Health, who reported that an emulsion of the material inoculated into a rhesus monkey produced paralysis and death on the seventh day and transfers to a second monkey produced typical paralysis. Pathologic study of the cord of the second monkey showed evidence of severe poliomyelitis. Three additional transfers produced typical poliomyelitis.

A portion of brain and cord removed at autopsy in case 13, also studied by Dr. Armstrong at the National Institute of Health, produced paralysis in a monkey and through three transfers tremors and paralysis were produced. Pathologic study of the tissues resulted in a diagnosis of poliomyelitis, although this strain was apparently less virulent for monkeys than the strain taken from patient 16.

Microscopic examinations in case 13 at the Division of Laboratories and Research of the New York State Department of Health confirmed the diagnosis of poliomyelitis, and inoculation of the material into a monkey produced typical experimental poliomyelitis; further passage through a second animal gave similar results. Histologic appearances in both monkeys were those of poliomyelitis. Nasal washings from patient 17, obtained on the sixth day of illness, were sent to Dr. Armstrong, who reported that this material filtered and inoculated into a rhesus monkey failed to produce symptoms.

EPIDEMIOLOGIC EXAMINATIONS

Twelve of the cases occurred in males and eight in females; the ages varied between 4 months and 21 years. Twelve of the patients were 5 years of age or younger and all but three were under 10 years of age. Seven of the cases were in children of Italian descent and four were in children of recent descent from other European

nationalities. There was a rather definite geographic grouping of cases in the city. Ten of the cases occurred within a radius of three city blocks and all but two occurred in persons residing within ten blocks of the Niagara River. This did not, however, constitute a definite concentration of cases near the waterfront, because the city is located at a bend in the river and is distributed along both arms of the angle. The economic status of the families in which cases occurred was in general a little below average, but in none was there evidence of great poverty. The children suffering from the disease almost invariably were especially healthy and well nourished prior to the illness. No history of direct contact between the patients was obtained, but in a number of instances friends were found to have been common to more than one patient. No multiple cases occurred in any household nor were there any suspicious illnesses among contacts of the patients. In only one instance was there a history of previous poliomyelitis in the immediate family, and in one there was a history of poliomyelitis in a first cousin several years previously.

No one milk supply was found to have been used by any disproportionate number of the patients. The usual water supply in all but one case was the municipal supply. In less than one third of the cases a history of recent use of a bathing beach or swimming pool was obtained and various bathing places were used by these. No history of recent insect bites was obtained in any case. Many of the patients, however, had died by the time the epidemiologic investigation was made, and the history obtained from the parents, although apparently given much thought, is open to question. Mosquitoes were prevalent at the time of the outbreak and were apparently more prevalent than is usual at that season.

TABLE 3.—*Muscle Groups Involved and Clinical Classification in Niagara Falls of Poliomyelitis, 1938*

Case No.	Muscle Groups Involved					Evidence of Respiration Failure	Clinical Classification	Outcome
	Upper Extremities	Lower Extremities	Abdominal and Trunk Muscles	Facial Muscles	Ocular Muscles			
1	+	+	+	+	?	+	Bulbospinal	Died
2	?	?	0	+	+	+	Bulbospinal	Died
3	+	+	+	0	0	0	Spinal	Recovered
4	0	0	0	+	+	?	Bulbar	Died
5	?	+	?	+	+	+	Bulbospinal	Died
6	+	+	?	+	?	+	Bulbospinal	Recovered
7	+	+	+	0	0	0	Spinal	Died
8	+	+	?	?	?	+	Bulbospinal	Died
9	+	+	?	+	?	+	Bulbospinal	Recovered
10	0	0	0	0	0	0	Nonparalytic	Recovered
11	+	+	0	0	0	0	Spinal	Recovered
12	0	+	+	+	0	0	Bulbospinal	Died
13	+	0	?	+	0	+	Bulbospinal	Recovered
14	0	+	0	0	0	0	Spinal	Died
15	+	+	+	+	0	+	Bulbospinal	Died
16	+	+	+	+	+	+	Bulbospinal	Recovered
17	+	0	0	0	0	0	Spinal	Recovered
18	0	+	+	0	0	0	Spinal	Died
19	+	+	0	0	0	+	Bulbospinal	Died
20	+	+	+	+	0	+	Bulbospinal	Died

+ Indicates definite positive signs; 0, no evidence of paralysis.
? Recovered with residual paralysis.

This unusual prevalence of mosquitoes was observed, however, in other areas in the state. Several parents, when questioned as to prevalence of insects or vermin, remarked that an unusual number of spiders had been observed. In no instance was there a known close association with horses. Cats and dogs were associated as pets in several instances, but no definite evidence of association of more than one case with the same pet was observed. No evidence of rat infestation of homes was noted.

SUMMARY AND CONCLUSIONS

A definite epidemic prevalence of poliomyelitis occurred in the city of Niagara Falls during July, August and September 1938. Clinical and laboratory observations confirmed the diagnosis of poliomyelitis.

Thirteen of the twenty cases showed evidence of bulbar paralysis; twelve of these cases terminated fatally.

In only two of the cases classified as bulbar in type had a tonsillectomy ever been done, one two weeks preceding the onset of poliomyelitis and one four years preceding the onset. No other operative procedure in the mouth, nose or throat had preceded the poliomyelitis in these cases.

No evidence of direct or indirect contact between cases could be elicited, but there was a distinct grouping of cases in a limited area. No factor in the environment was found to be common to any large proportion of the cases other than the water supply.

Clinical Notes, Suggestions and New Instruments

PREGNANCY COMPLICATED BY ACUTE ANTERIOR POLIOMYELITIS

JOSEPH R. MORROW, M.D., AND SANFORD A. LURIA, M.D.
RIDGEWOOD, N. J.

Little has been written on pregnancy complicated by acute anterior poliomyelitis. This is especially true of case reports that were followed to term and through parturition. One of the most recent articles on this subject was published in July 1933 by Brahdy and Lenarsky,¹ in which three cases were reported which were followed post partum. The summary of eight previous cases was also given. It is likely that a few other similar cases may not have been reported. Nevertheless, the incidence of epidemic poliomyelitis during pregnancy is probably rare.

This case is of particular interest not only because of the unusual and hazardous complications of gestation but also because of the many problems which were encountered relative to the disease process per se. Some of the questions for consideration were (1) viability and effect of this disease on the fetus, (2) the antiviral power of the fetus toward this disease, (3) type of delivery necessary, (4) whether surgical intervention would be advisable prior to term and (5) effects of the muscle atony on the parturient canal and bony pelvis.

In the eleven cases previously reported, delivery of the child was spontaneous in most instances, although there were two cesarean sections and one therapeutic abortion. The newborn infants were not infected by the poliomyelitis virus, although there was one stillbirth in which no evidence of this disease was shown but death was due to prematurity.

There are two schools of thought regarding the occurrence of poliomyelitis in pregnant women. Aycock² is of the opinion that poliomyelitis may occur more frequently in the latter part of pregnancy than would normally be expected if this condition had not been predisposed to the disease. On the other hand, Jungeblut and Engle³ state that both early pregnancy and infancy are the high water marks of natural resistance to poliomyelitis. Their accounts were based on the results of the examination of blood from several women during various stages of pregnancy. They found higher antibody titers than are

commonly found in healthy, nongravid persons. McGoogan⁴ in 1932 published an article on three cases of pregnancy complicated by poliomyelitis and also the results in five similar cases which were reported in the literature during a period of twenty-five years. This is the first case of its kind in this hospital since its inception twenty-three years ago.

REPORT OF CASE

History.—E. W., a woman aged 28, was admitted to this institution Aug. 16, 1938, by transfer from one of the near general hospitals. She had had measles, epidemic parotitis and varicella; otherwise the past history was not remarkable. The patient was married; her husband and one child were living and well. Her father and mother were both living and well.

One week prior to admission, the patient complained of severe headache and felt "feverish." This condition was followed in a short time by nausea and vomiting. The family physician was called and made a tentative diagnosis of meningitis, based on the meningeal manifestations. The patient was immediately sent to a general hospital, where a spinal tap was performed and meningococcus serum was introduced intrathecally, as is customary in many institutions in cases of suspected meningitis. Twenty-four hours later she noticed an inability to move her legs and complained of severe pain through both lower and upper extremities and the lumbosacral region. She also gave a history of being unable to void urine or defecate. She was then transferred to Bergen Pines. It was further learned from the history that she had been gravid for five and one-half months. Cessation of menses occurred in the month of March, approximately five months prior to admission.

Physical Examination (by systems at time of admission).—The patient was found to be well developed and well nourished. She appeared very lethargic and responded poorly to questions, although answers were coherent. Her face was flushed, the skin moist and smooth, and there was no evidence of any eruption over the entire body.

The eyes were normal except that the pupils were dilated slightly more than normal. There was slight deviation of the septum to the left. The pharynx was mildly injected. The tonsils were atrophic and submerged. There were slightly palpable anterior and posterior cervical glands.

The heart sounds were distinctly audible over the entire precordium. No adventitious sounds were heard. There was moderate tachycardia. Respiratory excursions were diminished, more noticeably on the right side. The breath sounds were heard clearly throughout the upper two thirds of the chest and slightly diminished over the bases, especially anteriorly. No rales were heard.

The abdomen was markedly distended and the uterus could be palpated, extending from behind the symphysis to three finger-breadths below the umbilicus. There was a tympanitic note heard on percussion over the entire abdomen, except for the lower third, which was dull because of retention of urine in the bladder. Tenderness was elicited over both costovertebral regions. The fetal heart sounds were heard with difficulty; and the rate could not be determined.

The neck was markedly rigid. The pupils were slightly dilated but reacted to light and in accommodation. The ophthalmoscopic examination revealed normal fundi. The right palatine muscles were paralyzed. The pharyngeal reflex was diminished and phonation impaired. The intercostal group of muscles were weak bilaterally, as evidenced by the diminished respiratory excursion, more so on the right. The abdominal reflexes could not be elicited. Peristaltic or borborygmnic sounds could not be heard in spite of marked distention. There was no muscular contraction on voluntary effort. There was also paralysis of the lumbosacral group of muscles.

There was weakness and partial paralysis of the arm, forearm and shoulder girdle of both upper extremities. There was complete flaccid paralysis of both lower extremities from the trunk line down. In addition, there was involvement of the autonomic nervous system as related to the gastrointestinal tract and the urinary bladder, resulting in an inability to defecate and void.

Kernig's sign was positive bilaterally. Both patellar and achilles reflexes were absent. Babinski, Oppenheim, Gordon

The authors were aided by Dr. William Tompkins, who cooperated in this case.

1. Brahdy, M. Bernard, and Lenarsky, Maurice: *Acute Epidemic Poliomyelitis Complicating Pregnancy*, J. A. M. A. 101: 195 (July 15) 1933.

2. Aycock, W. L.: J. Prev. Med. 4: 201 (May) 1930.

3. Jungeblut, C. W., and Engle, E. T.: *Resistance to Poliomyelitis*, J. A. M. A. 99: 2091 (Dec. 17) 1932.

4. McGoogan, L. S.: *Acute Anterior Poliomyelitis Complicating Pregnancy*, Am. J. Obst. & Gynec. 24: 215 (Aug.) 1932. Miller, N. F.: J. Michigan M. Soc. 23: 58 (Feb.) 1924.

and ankle clonus were all negative. Biceps and triceps reflexes were also negative. The Hoffman sign was negative.

Since the paralysis was ascending, beginning with the lower extremities and progressing upward, it was very similar to Landry's type. A diagnosis of acute anterior poliomyelitis, early paralytic stage, superimposed on a five and one-half months pregnancy, was made from the results of the foregoing examination and the confirming spinal fluid report, which will be given along with other laboratory data.

On admission August 16 the urine was normal. Blood examination revealed 3,870,000 red blood cells, hemoglobin (Sahli) 80 per cent, 11,250 white blood cells, polymorphonuclears 85 per cent, lymphocytes 14 per cent, mononuclears 1 per cent.

A throat culture was positive for hemolytic streptococci.

As the result of a spinal tap, opalescent fluid was removed under slightly increased pressure with 180 cells: polymorphonuclears 48 per cent, lymphocytes 52 per cent, globulin reaction 2 plus, sugar 74 mg. per hundred cubic centimeters. Chloride determination was not done. The spinal fluid report obtained prior to the patient's transfer was similar.

Course.—This was very stormy, owing to the patient's extreme toxemia and the extensive paralytic involvement. Her facies, which was very conspicuous, varied from marked apathy to extreme apathy.

On the second day following admission the patient had a chill, the temperature rising to 106 F. At this time she became irrational. Fortunately, this condition was transitory in nature and the patient regained her mental clarity within twenty-four hours. The gastrointestinal atony, simulating a paralytic ileus, and the associated distention, which was very resistive to almost all remedial agents, contributed greatly to the respiratory embarrassment, which had already been hampered by partial paralysis of the intercostal and diaphragmatic muscles. Bowel evacuation was obtained only by daily enemas. Frequent catheterization was necessary owing to rapid filling of her temporarily denervated bladder. In the following few days there developed a urinary tract infection which, along with the toxemia, caused a continuation of the septic type of temperature, which ranged between 101 and 104 F. for a period of sixteen days. Blood studies at this time revealed a hypochromic anemia, which further complicated the clinical course. This iron deficiency anemia was unlike the usual anemia associated with pregnancy in that it was very resistive to therapy. Massive doses of ferric and ferrous salts in the form of sulfate, carbonate and ammonium citrate were given at different times with no apparent response. Liver and vitamin B₁ were then given, along with the iron salts, but these also were of no substantial value. Multiple transfusions were necessary to help maintain the hemoglobin and red blood cells at a fairly constant level, in spite of which they remained slightly subnormal. We attributed this anemia not only to the pregnancy but also to the toxemia, which may have partially exhausted the hemopoietic system. Hemoglobin levels ranged between 50 and 77.

August 28, blood examination revealed 3,190,000 red blood cells, hemoglobin 61 per cent, 20,900 white blood cells, polymorphonuclears 90 per cent, lymphocytes 8 per cent, mononuclears 1 per cent, basophils 1 per cent. The polymorphonuclear cells showed toxic granules.

Urinalysis at this time revealed the specific gravity to be 1.010, acid reaction, a heavy trace of albumin, pus clumps, and many white blood cells and bacteria.

The patient's condition was considered critical for eighteen days. Following this period she started to show gradual and progressive improvement. The temperature returned to within normal range. The abdominal distention, however, continued to cause her discomfort frequently, but less so than previously. Within the following four weeks it was noticed that there was some muscle restoration in both upper extremities, the chest and the trunk. There was a return of bowel and bladder function to voluntary control. The pyelitis improved but still showed occasional pus clumps and traces of albumin in the daily specimens of urine. The blood pressure, which had been 160/90, finally became 138/85. It was possible that the poliomyelitis had begun to precipitate a preeclamptic state earlier in this disease.

The remaining course in the hospital was comparatively uneventful. During the entire stay of the patient in the hospital the fetal heart sounds could be heard and movements could be felt both objectively and subjectively. The size of the gravid uterus reached to one fingerbreadth above the umbilicus prior to discharge.

Treatment.—Although the value of convalescent serum is still controversial, there have been some encouraging reports following the administration of large doses of serum intravenously early in the disease. Our own experience with convalescent serum has always been of doubtful value. Nevertheless, the patient was transfused with the blood obtained from an adult who had recovered from this disease. It was believed that it would therefore serve a twofold purpose (1) as a therapeutic for the toxemia and (2) for possible specific antibody effect. The specificity of this procedure was doubtful.

Vitamin B₁ and C parenterally was also given, as this form of treatment has been suggested more recently by various workers in this field. Vitamin B₁ intraspinally, as suggested by Stern⁵ in one of his recent reports, was decided against, as we feared the possibility of further meningeal irritation and development of a chemical meningitis, which one of us (S. A. L.) has observed. The remaining treatment consisted essentially of hypertonic intravenous infusions in the form of 50 per cent sucrose, spinal taps as indicated, multiple transfusions, iron and liver therapy, ultraviolet radiation and other symptomatic and supportive measures. The orthopedic care was limited to immobilization of the involved members, followed three months later by very gentle massage therapy.

Although the patient was discharged with the understanding that she should be further hospitalized for orthopedic and obstetric care, she preferred to remain at home under the care of her family physician and obstetrician for economic reasons. The course while at home, as related to us by her family physician, was also uneventful except for the persistent anemia.

December 20 the patient suddenly experienced labor pains and was immediately rushed to the hospital. The labor progressed rapidly and it was felt then that she might precipitate. On arrival at the hospital she was taken immediately to the delivery room and delivered a 6 pound (2,720 Gm.) living girl baby in apparently good condition. The delivery itself was rather simple, although it required forceps and episiotomy.

Her postpartum course was also uneventful. In spite of an apparently lowered resistance, no puerperal infections developed. She had received three transfusions and her blood picture returned to normal within three weeks. The infant's condition remains good up to the present writing, showing no evidence of paralytic involvement.

COMMENT

In reviewing the case, one is inclined to believe that the antiviral titer toward poliomyelitis in gravid women does not differ from that of other adults who may contract this disease. However, this is not true, apparently, as it has been pointed out that the incidence of poliomyelitis during pregnancy is relatively low. The fetus perhaps does not contract the disease, as the virus probably does not enter the placental circulation. However, there has been a case report by Lance⁶ of poliomyelitis in the newborn, but the evidence presented is inconclusive and there was no history of an acute infection during the course of pregnancy. If death does occur to the fetus, it is probably due to the toxemia which accompanies poliomyelitis, rather than to the virus per se.

With regard to the parturition, there is apparently no variation from other paraplegias due to other causes such as spinal cord tumor or trauma except that, in the latter, labor is painless, although in cases with respiratory involvement cesarean section may be indicated before term if the increasing size of the uterus further hampers respiration. Also in those cases of bulbar involvement in which death is imminent a cesarean section should be done immediately after the patient's death to save the viable fetus.

5. Stern, E. L.: The Intraspinal (Subarachnoid) Injection of Vitamin B₁ for the Relief of Intractable Pain and for Inflammatory and Degenerative Diseases of the Central Nervous System, *Am. J. Surg.* 33:495 (March) 1938.
6. Lance: Infantile Paralysis Noted at Birth, *Bull. Soc. de pediat. d. Paris* 31:229 (May) 1933.

This case differs from most of those that have been reported because of the extensive involvement which, unfortunately, the patient encountered because of her relatively high susceptibility and other complications which developed relating to both pregnancy and poliomyelitis. Nevertheless it is encouraging to learn further that these women can deliver normally and also give birth to healthy infants.

Blood studies of the child and the mother for neutralization against the poliomyelitis virus have been determined. The laboratory results of the tests on the newborn babe show that she carries poliomyelitis neutralizing antibodies in such amount that 0.2 cc. neutralized about 25 minimal infective doses of virus in an exposure of two hours at 37 C. followed by an overnight temperature of 4 C.⁷

The mother's blood, which was studied six months following the acute onset of the disease, showed a very high antiviral blood content, as the control monkeys developed acute anterior poliomyelitis eleven days after intracerebral inoculation, while those injected with the serum virus mixture remained healthy. The laboratory procedure in the latter instance was done merely to determine whether the patient may have lost any of her immunity since the onset of the disease.

GROUP COLOR VISION TESTS

CONRAD BERENS, M.D., AND LESTER STEIN, M.D., NEW YORK

The desirability of including routine color vision tests in all eye examinations is widely recognized. Of particular importance is the evaluation of the color vision of civil service applicants, motor vehicle licensees, mariners, railway employees and others whose occupations require normal color vision. Routine school examinations should include some form of color vision testing, but the necessity of examining large classes has frequently led to the omission of color vision testing. The regular physical examination for the military services includes rigorous color vision tests.

When large groups of persons are involved, color vision tests by the present methods are usually arduous and expensive and require the services of numerous examiners. Therefore the need for quick, accurate, acceptable color vision tests of large groups of persons is evident.

METHOD

The method to be described apparently fulfils the requirements for color vision tests for large groups of subjects. A search of the literature from 1929, when color photography became more accurate, reveals no mention of this method. It employs among other tests the standard pseudo-isochromatic Ishihara or Stilling charts, which are world accepted for testing color vision. The published color vision charts are copied with Kodachrome film and then made into colored lantern slides. These colored lantern slides can be made in miniature size by employing the 35 mm. Kodachrome film. The copies can be made with any of the usual miniature cameras available in conjunction with the manufacturer's recommended copying accessories. In this way 2 by 2 inch miniature lantern slides are obtained. These are suitable for projection in any of the special miniature lantern slide projectors. The image projected is just as large, clearly defined and of good color value as that projected with the large lantern slide projectors. For those wishing to use the large lantern slide projectors, however, it is also feasible, but more expensive, to employ 3¼ by 4¼ inch sheet Kodachrome film and make large slides for use in the large projectors. The larger slides afford no advantage over the miniature slides. For best projection results glass bead screens should be employed. Many models, both of fixed and of portable types, are available commercially.

This projected test has been used in testing color blind persons and the results have been compared with a similar test employing the original test plates. It was found that the results were identical.

7. Neutralization tests for poliomyelitis by Dr. John Kolmer, Research Institute of Cutaneous Medicine.

Aided by a grant from the Ophthalmological Foundation, Inc. Presented before the Section on Ophthalmology, New York Academy of Medicine, April 17, 1939.

From the Department of Research of the Lighthouse Eye Clinic of the New York Association for the Blind.

TECHNIC OF EXAMINATION

In actual use the test is performed as follows: The subjects are seated in a suitable projection room, semidarkened to permit a good view of the screen, and each is supplied with a printed schema containing key numbers corresponding to the slides, which are projected on the screen in order. The subjects are required to write the figure that they identify on the pseudo-isochromatic chart projected on the screen next to the key number on the schema. The written responses may be rapidly totaled by matching them with the master record, and a quick estimate of color vision can be made and duly recorded. This permanent record may be kept for future comparisons to be written in adjacent columns.

ADVANTAGES

The advantages of the method are the ease with which the tests are performed on large groups of subjects and the small expense involved. A few examiners can determine the color vision of thousands of subjects in much less time than has hitherto been required.

Permanent self-written records are obtained and repetition of the test is fairly simple and easily carried out and can be performed as part of an annual examination.

Easy interchangeability of the various color tests is afforded because one can employ Ishihara or Stilling charts or other forms of pseudo-isochromatic charts with equal facility by merely altering the order of the slides.

The malingering tests included in the Ishihara and Stilling plates, the threshold tests after the Young method, the Edridge-Green and other lantern tests, the Worth four dot test¹ and its modifications² and the kindergarten chart with colored figures³ may be similarly projected.

Visual acuity need not be normal, since it is easy to magnify the images by projection and thus obviate errors occasioned by subnormal vision of moderate degree.

Disturbances of color vision which are found in certain diseases, e. g. toxic amblyopia, optic neuritis and retrobulbar neuritis, may be revealed.

Motor vehicle license control is facilitated greatly by this method of testing large groups of licensees.

For the testing of illiterate subjects and young children, charts have been constructed employing the international broken ring, the illiterate E or the Snellen pronged figure. In addition, for little children pseudo-isochromatic tests may be drawn using kindergarten figures such as animals, toys, men, dogs, boats and similar easily recognized objects placed on a confusion color background. A method of constructing these charts simply has been devised and is being studied at the Lighthouse Eye Clinic.

An important corollary of this method is the possibility of employing projected color slides of various scenes, objects and charts to educate color blind persons to differentiate various colors and by association teach them to adapt themselves to their environment.

In addition, it is feasible to include the test in any of the projector type visual acuity apparatus now available, for example the Ferree-Rand visual acuity projector or the projectoscope, and thus increase the field of usefulness of these machines and provide satisfactory office color vision tests.

SUMMARY

In a method for testing large groups of subjects for disturbance of color vision the Kodachrome film is employed to make colored copies of the Ishihara or Stilling or newly constructed charts in either miniature (2 by 2 inch) or regular (3¼ by 4¼ inch) sizes.

Projection of the slides yields good images, readily perceived in large audience halls and thoroughly satisfactory for the testing of the color vision of large groups of subjects.

The advantages include ease of testing, small expense and permanent records, written by the subject himself. Disturbances

1. Worth, Claud: *Squint: Its Causes, Pathology and Treatment*, London, Bailliere, Tindall & Cox, 1921, p. 14.

2. Hardy, L. H.: A Modification of the Four Dot Test, *Tr. Am. Acad. Ophth.*, 1937, p. 491. Berens, Conrad: Modification of the Worth Four Dot Test, *Am. J. Ophth.*, to be published; A Test for Binocular Vision, Particularly Applicable to the Examination of Amblyopic Children; *Tr. Am. Ophth. Soc.*, 1939.

3. Berens, Conrad: Kindergarten Visual Acuity Chart, *Am. J. Ophth.*, 21: 667 (June) 1938.

of color vision, which would suggest further studies for the diagnosis of certain diseases, may be revealed by these mass color vision tests. This method of testing greatly facilitates the examination of drivers of motor vehicles, aviators, railroad employees and applicants for the army, navy and marine services. Forms of the pseudo-isochromatic color vision tests, employing illiterate and kindergarten figures and the international broken ring, are being developed.

The possibility is suggested of educating color blind persons to differentiate colors by demonstrating colored scenes and charts.

35 East Seventieth Street.

WOOD TICK SIMULATING PEDUNCULATED TUMOR

KURT WIENER, M.D., MILWAUKEE

Ormsby writes that the female of the wood tick (*Ixodes*) after sucking blood from the skin swells to the size of a pea or a small bean and may be mistaken for a small pedunculated tumor. How true this is may be illustrated by the case reported here.

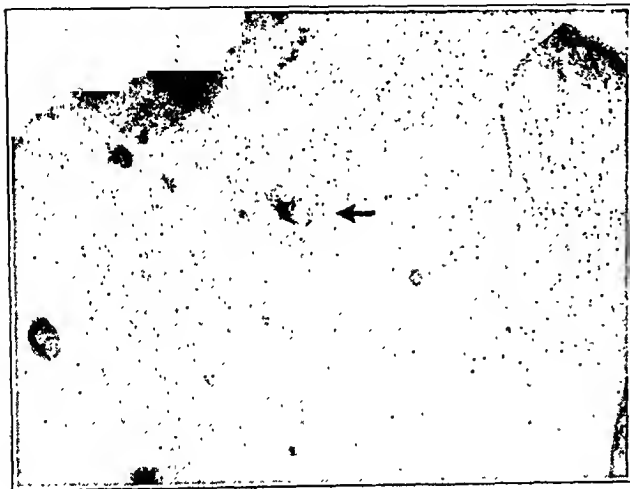


Fig. 1.—Appearance of patient's chest.

An elderly man who has a number of partly pedunculated and pigmented senile keratomas and fibromas on his chest (fig. 1) complained that one of them started to burn and itch. At first glance the little tumor did not look especially different from the others. When viewed more closely (fig. 2) the coffee bean size tumor was found to have eight legs and proved to be a wood tick (*Ixodes*) which the patient had picked up in the woods of



Fig. 2.—Close view of object indicated by arrow in figure 1.



Fig. 3.—Wood tick with beak buried in skin.

Northern Wisconsin two weeks previously. The tick, apparently aware of the high value of good mimicry and well acquainted with Ormsby's textbook, had chosen a human skin with little tumors where it could partake of its sanguinary meals with much less danger than on a normal skin. A drop of turpentine helped to remove it. Figure 3 shows how its beak is buried in the skin.

425 East Wisconsin Avenue.

INTESTINAL OBSTRUCTION CAUSED BY COLLOIDAL ALUMINUM HYDROXIDE

W. PAUL HAVENS, M.D., PHILADELPHIA

Colloidal aluminum hydroxide has been widely used for the treatment of peptic ulcer since Crohn reported its value as an antacid in 1929. There has been little information available concerning any untoward effects. Kraemer¹ described frequent constipation and the occurrence of fecal impaction in two cases, but the majority of observers have not mentioned such complications.

The following case illustrates the danger which exists and the unfortunate result which may occur when colloidal aluminum hydroxide is used in the treatment of certain cases of bleeding duodenal ulcer.

M. F., a Negro woman aged 59, a widow, was admitted to the hospital complaining of generalized weakness and intermittent pain in the lower part of the abdomen of two weeks' duration.

There was moderate enlargement of the heart, and the blood pressure was 180 systolic and 110 diastolic. She was treated for hypertensive cardiovascular disease for three weeks. At the end of this time an episode occurred which suggested a sudden internal hemorrhage. She became weak and restless and the mucous membranes appeared pale. The blood pressure fell to 110 systolic and 60 diastolic, and the pulse rate rose to 138. The hemoglobin content and the red cell count, which had been 80 per cent and 3,850,000 respectively, fell to 30 per cent and 1,000,000. Several unformed stools were tarry. She was given frequent feedings of gelatin water and gruel with 8 cc. of colloidal aluminum hydroxide every two hours for three and one-half days. A tube was then placed in the stomach, and a constant drip of two parts water and one part colloidal aluminum hydroxide was allowed to flow in at a rate of 2,000 cc. in twenty-four hours. To this was added 160 cc. of corn syrup (karo) for two days. The patient remained in poor condition in spite of frequent transfusions of blood. Bleeding from the bowel continued and she failed to gain strength. Although she was given liquid petrolatum only once, enemas were effective at least every other day and frequent examinations for fecal impaction gave negative results. Because of restlessness, morphine sulfate 10 mg. was administered every four hours for a few days. After seven days of treatment with the constant drip the abdomen became distended and no peristalsis was heard. A diagnosis of intestinal obstruction was made. Suction was applied to the tube in the stomach and 1,900 cc. of greenish yellow fluid was obtained, which reduced the distention slightly. An enema caused the evacuation of a moderate amount of tarry material. Her condition became progressively worse and she died a few hours later.

At necropsy the characteristic changes of arteriosclerotic cardiovascular-renal disease were noted. The heart was slightly enlarged and there were moderate atherosclerotic changes in the arteries. Immediately adjacent to the pyloric sphincter in the duodenum there was an ulcer measuring 3 by 1.2 by 0.4 cm. The jejunum and proximal two thirds of the ileum were distended with gas. Beginning at about the midportion of the ileum, the lumen contained a semisoft putty-like material which in the distal portion became more inspissated, until firm casts of the bowel were formed which caused total obstruction. Immediately distal to the ileocecal valve was a large globular mass of the same material mixed with inspissated blood, approximately 7 by 8 cm., forming a partial cast of the cecum. Lumps of similar material about 2 by 6 cm. in size were present in the remainder of the cecum and transverse colon. Beginning at about the midportion of the transverse colon several hard reddish black masses measuring approximately 2 by 5 cm. were present, and these became larger in the descending colon, sigmoid flexure and rectum.

COMMENT

Reports on the constipating effect of colloidal aluminum hydroxide and the occurrence of fecal impaction following its use are infrequent. The preparation used (amphogel) contains

From the Department of Medicine, Jefferson Medical College Hospital.
1. Kraemer, Manfred: The Use of Hydrated Magnesium Trisilicate in Peptic Ulcer, *Am. J. Digest. Dis.* 5:422 (Sept.) 1935.

about 5 per cent aluminum hydroxide, which, combined with the astringent effect produced, may favor constipation, especially when there is blood in the intestine. It is possible that the frequent use of liquid petrolatum and enemas by the vigorous young adult may lessen the danger of this complication, but there appears to be a danger in administering aluminum hydroxide to older or very ill patients, whose energy is depleted and whose intestinal tract may lack normal tonus. As a further precaution, morphine sulfate, because of its alleged depressant action on the bowel, should be used only with caution. It is possible that the gelatin given together with the aluminum hydroxide aided in forming firm masses.

Special Clinical Article

THE SURGICAL ASPECTS OF CARCINOMA OF THE STOMACH

CLINICAL LECTURE AT ST. LOUIS SESSION

ALFRED BROWN, M.D.

OMAHA

Over the seven year period from Jan. 1, 1931, to Jan. 1, 1938, there have been 10,458 deaths from cancer of all forms in the state of Nebraska. The figures for 1938 are not yet available. Of these deaths cancer of the digestive tract and peritoneum furnished 5,519, or a little more than half the total deaths from cancer (table 1). The facilities of our state health department do not enable a complete breakdown of site and organ, but it is reasonable to assume that from one third to one half of the deaths from cancer of the digestive tract and peritoneum are due to cancer of the stomach. This makes approximately 2,000, or one fourth, of the deaths from cancer of all forms due to carcinoma of the stomach. With these facts in mind, it seemed worth while to make a study of the situation regarding cancer of the stomach as we see the disease in the Hospital of the University of Nebraska School of Medicine, as this institution receives patients from the entire state.

In order to evaluate these cases, the histories of all cases of cancer of the stomach in the University Hospital between Jan. 1, 1931, and Jan. 1, 1939, were gone over and classified under headings that were selected to give the best idea of the condition of the patient at the time of admission and discharge. The histories in these cases were taken by first year interns who are serving on a one year general rotating intern service. Consequently the histories are not particularly detailed or directed especially to obtaining symptoms due to disturbance of the gastrointestinal tract and are in no way specialized along this line. They do, however, give interesting information and should be a true comparison with histories which could be elicited by the general practitioner.

There have been eighty cases of cancer of the stomach admitted to the University Hospital during the eight year period and the statistics regarding these cases have been arbitrarily divided into two periods. The first, from Jan. 1, 1931, to Jan. 1, 1936; the second, from Jan. 1, 1936, to Jan. 1, 1939. This arbitrary line was chosen for two reasons: first, because the first division represents a five year period and, second, because 1936 represents the first year in which a patient suitable for resection of the growth in the stomach entered the Uni-

versity Hospital. All the cases in the first five year period were so far advanced that resection was technically impossible.

In the first group there were thirty-two males and nine females, and in this group it will be noted that the greater percentage occurred in the 50-59 year decade (table 2). In the second group there were twenty-five males and fourteen females (table 3). When, however, all cases were classified according to sex it will be noted that the majority of our cases in women occurred during the sixth decade while during the preceding and following decades the number is markedly diminished (table 4). In men the occurrence of the disease is spread over the sixth and seventh decades with a marked falling off toward the earlier decades and a lesser falling off in later years.

In the largest percentage of cases the cancer was in the prepyloric region of the stomach, the lesser curvature was next and the cardia and greater curvature in the smallest percentage of cases.

In the first group, seventeen of forty-one patients complained of premonitory symptoms over periods of from six months to twenty-five years. This period was computed from the time the patients were admitted to the University Hospital and a definite diagnosis of cancer was made.

The premonitory symptoms are shown in table 5 and only those symptoms which were directly referable either to cancer or to some abdominal condition were selected to be included in the summary.

In the second group of thirty-nine patients, thirty-one complained of premonitory symptoms over periods varying from five months to thirty years (table 6). The larger percentage of patients complaining of premonitory symptoms in this group may be due to the fact that the interns were more careful in history taking because, knowing of this investigation, they were more alert in inquiring about gastric symptoms. The type

TABLE 1.—Cancer Deaths in the State of Nebraska

Year	Cancer (All Forms)	Cancer of Digestive Tract and Peritoneum
1931.....	1,420	690
1932.....	1,424	814
1933.....	1,432	783
1934.....	1,545	824
1935.....	1,511	778
1936.....	1,569	832
1937.....	1,557	798

of premonitory symptoms calls attention to the controversy as to whether or not cancer develops on ulcer. This question has in past years divided pathologists into two groups: those who believe that cancer develops on an ulcer base and those who believe the contrary. It is not in the province of the clinician to enter into this discussion from the histologic basis. From the clinical standpoint this investigation shows that of a total series of eighty patients forty-eight, or more than 50 per cent of the patients, complained of definite or indefinite abdominal symptoms over a period of from five months to thirty years. In some of the cases a diagnosis of ulcer of the stomach or duodenum had been made and in some the statement had been made that this ulcer had been cured. Consequently, from the clinical standpoint the active symptoms of carcinoma of the stomach are preceded in many instances by a train of either definite or indefinite abdominal symptoms over a considerable period of months or years preceding the development of cancer itself.

Our results show that the patient with cancer of the stomach who presents the classic symptoms and clinical evidences of the disease at the time of entrance into the hospital usually has a carcinoma so advanced that surgical aid is at the best extremely hazardous and in the great majority of cases any surgical attack is contra-indicated.

TABLE 2.—*Sex and Age Incidence in Forty-One Cases of Carcinoma of the Stomach, Jan. 1, 1931, to Jan. 1, 1936*

Males.....	32 cases
Females.....	9 cases
Youngest patient.....	37 years
Oldest patient.....	81 years
By decades:	
30 to 39 years.....	1 case
40 to 49 years.....	7 cases
50 to 59 years.....	17 cases
60 to 69 years.....	11 cases
70 to 79 years.....	4 cases
80 years and over.....	1 case

In the first five year series of forty-one cases we were unable to find any case suitable for radical resection of the carcinoma.

In the second group, of thirty-nine cases over a period of three years, radical operation was performed on seven patients. One of these patients was still living ten days ago:

A man aged 74 had had abdominal pain off and on for thirty years and entered the hospital because he had had nausea accompanied by vomiting of everything he ate for six weeks and during this period had been bedridden. During his period of bed confinement he had lost between 15 and 20 pounds (7 to 9 Kg.). He had only a moderate grade of anemia, with 80 per cent hemoglobin. He had some free hydrochloric acid in the last three specimens of the fractional gastric test. He had a palpable mass in the abdomen, and at operation what was thought to be an annular carcinoma of the prepyloric region was found. A Billroth I operation was performed. The operation was complicated by a parotitis which did not require surgical drainage and he was discharged from the hospital after a six weeks stay. A report from his physician states that on May 6, 1939, he weighed 146 pounds (66 Kg.), a gain of 16 pounds (7 Kg.) over his hospital admission weight. At the present time he has occasional attacks of abdominal cramps which yield to digestive remedies.

TABLE 3.—*Sex and Age Incidence in Thirty-Nine Cases of Carcinoma of the Stomach, Jan. 1, 1936, to Jan. 1, 1939*

Males.....	25 cases
Females.....	14 cases
Youngest patient.....	14 years
Oldest patient.....	79 years
By decades:	
10 to 19 years.....	1 case
40 to 49 years.....	2 cases
50 to 59 years.....	14 cases
60 to 69 years.....	11 cases
70 to 79 years.....	11 cases

Unfortunately, the specimen removed from this patient was lost and a histologic examination was not made. It must, therefore, remain a question as to whether this was actual cancer or callous ulcer without malignant change. The other surgical patients all died within a year and there were three postoperative deaths in periods of from three to ten days following operation.

One other case appeared to be suitable for resection but operation was refused. In six cases exploratory

operation was performed and an inoperable carcinoma found. In two cases gastro-enterostomy was performed and death occurred in one three months after operation; the other has not been traced. Consequently the result of surgery in these eighty cases reveals one patient alive and apparently well ten months after operation, and there is some doubt whether this patient had a carcinoma.

METHODS OF TREATMENT

The operations performed in these cases were different types of procedure and were directed toward the mechanical condition of the carcinoma when examined with the abdomen open. In one case the lesion was thought to be benign at the time of operation and a gastro-enterostomy was performed for what was considered to be a prepyloric ulcer. A resection was not performed at the time because of the poor condition of the patient but examination of the specimen showed definite adenocarcinoma. After a further period of preparation a resection of the pylorus was performed and the patient lived for eight months. Autopsy showed metastatic carcinoma of the liver. In two cases the Billroth I operation was performed. One of these patients died from peritonitis six days after operation. Autopsy showed an unsuspected Krukenberg tumor of

TABLE 4.—*Sex and Age Incidence in Eighty Cases of Carcinoma of the Stomach, Jan. 1, 1931, to Jan. 1, 1939*

Males.....	57 cases	Females.....	23 cases
Youngest patient.....	37 years	Youngest patient.....	14 years
Oldest patient.....	79 years	Oldest patient.....	81 years
By decades:		By decades:	
30 to 39 years.....	1 case	10 to 19 years.....	1 case
40 to 49 years.....	5 cases	40 to 49 years.....	4 cases
50 to 59 years.....	21 cases	50 to 59 years.....	10 cases
60 to 69 years.....	18 cases	60 to 69 years.....	4 cases
70 to 79 years.....	12 cases	70 to 79 years.....	3 cases
		80 years and over.....	1 case

the ovary, with peritonitis due to perforation at the site of operation. In the remaining cases subtotal gastrectomy of the Polya type was performed. The longest period of life after this operation was nine months. During this period the patient had had practically no gastric symptoms. He had gained weight but succumbed to kidney complication following acute prostatic obstruction for which he refused operative relief. He died at his home in the western part of the state and an autopsy was not obtained.

A prominent symptom in the great majority of these cases in which blood examinations are available has been a grade of anemia which could not be accounted for on the basis of hemorrhage. This finding has been so constant that the presence of a marked anemia in a middle aged person without definite cause should call attention to the stomach as a point of attack for detailed investigation. Other symptoms studied—pain, loss of weight, absence of free hydrochloric acid and the appearance of occult blood in the stools—have been present in this series of cases in the same proportion as in other series.

A study of the observations in this series of cases raises the question whether the medical treatment of gastric ulcer is justified from the fourth decade of life on. Every patient is entitled to one attempt at medical cure of gastric ulcer. A recurrence of symptoms of ulcer after one medical regimen should raise the question as to the advisability of surgical exploration. If surgical exploration is carried out and a prepyloric

ulcer found it should be removed if technically possible in preference to the performance of a palliative drainage operation. We have a specimen in our laboratory of the development of carcinoma in the base of a healed ulcer. We have many specimens of carcinoma developed on ulcer. Consequently it still remains a question

TABLE 5.—*Premonitory Symptoms in Seventeen of Forty-One Cases, Jan. 1, 1931, to Jan. 1, 1936*

No.	Age	Sex	Character of Symptom
3	38	♀	Acanthosis nigricans
4	50	♂	Indigestion for 25 years
5	37	♂	Ulcer 4 years ago cured (?) 2 years
7	47	♂	Intestinal "flu" 6 months ago
8	42	♂	Ulcer for 4 years
9	53	♂	Ulcer for 18 months
10	55	♀	Stomach distress for 12 years
11	62	♂	Stomach trouble for 20 years
12	52	♂	Epigastric discomfort 2 years
16	42	♂	Intestinal "flu" for 1 week 5 months ago
21	53	♂	Heaviness in stomach 5 years ago
30	50	♀	Weakness, abdominal pain, sore tongue for 5 years
31	41	♂	Stomach trouble for 5 years
32	49	♂	Abdominal pain and jaundice 3 years ago, lasting 6 weeks
34	52	♀	Occasional stomach upset
37	59	♂ Col.	Dizzy, nauseated one year
38	64	♂	Weakness and fatigue 10 months ago

whether ulcer remaining in the stomach, even though it gives no symptoms, may not be a source of potential danger to the patient.

The type of operation performed should be the one most suitable to the type of ulcer encountered at operation. As an illustration I cite two cases which are my oldest living examples of patients in the cancer age whom I have recently followed up.

A woman, married, a school teacher, 52 years of age at the first admission, who was admitted to the hospital Aug. 14, 1926, at that time complained of indigestion, ushered in with an attack of intense nausea three years previously. A few months after the onset she complained of severe pain of the hunger type. She entered the hospital for Sippy treatment. On admission, free hydrochloric acid was 67, total 93. On discharge, free hydrochloric acid was 45, total 59. She had occult blood in her stool on two examinations, none for the remainder of her stay. She was discharged seventeen days after admission in an improved condition. She reentered the hospital Aug. 12, 1927, with the history that after leaving the hospital she felt much better. She had a gastric hemorrhage in the spring of 1927 followed by tarry stools. She had been on a diet for four years and she thought that these attacks were brought on by worry. Blood examination revealed 4,580,000 erythrocytes, 10,200 leukocytes, hemoglobin 79 per cent. A fractional gastric analysis showed an increase in free hydrochloric acid. The stool showed constant occult blood varying from 2 to 4 plus. X-ray examination showed an ulcer of the perforating type in the middle third of the lesser curvature of the stomach. The duodenal cap was deformed by scars resulting from old ulcers. August 22, a V shaped resection of the lesser curvature of the stomach including an ulcer of the perforating type about 1 inch by 1 inch in size was performed. Following operation the patient developed bilateral suppurative parotitis necessitating opening of both parotid glands. She finally made a good recovery and was discharged Oct. 12, 1927. She reentered the hospital Dec. 21, 1929, with the symptoms of hyperthyroidism. The goiter was removed by subtotal thyroidectomy and she made an uneventful convalescence. So far as gastric symptoms are concerned, she remains well today and carries on her work as a teacher. It is now eleven years and nine months after her gastric operation. A roentgenogram of the patient's stomach taken one year ago shows a markedly shortened lesser curvature, but it is apparently functioning sufficiently well to carry on normal digestion. It is to be noted that this was an ulcer in a woman in the sixth decade of life, at the time when

most carcinoma develops. No evidence of carcinoma, however, was present in the ulcer removed at operation and no glandular enlargement was demonstrable.

A man aged 61 at the time he was first seen in June 1930, married and an educator, complained of severe pain in the epigastrium coming on in attacks which simulated gallbladder colic. X-ray examination showed no shadow of the gallbladder with the Graham Cole test, and the gastrointestinal tract appeared to be normal. Temperature, pulse and respirations were normal. The heart and lungs were normal. There was moderate tenderness in the epigastrium. No respiratory catch occurred on inspiration, and no masses were felt in the abdomen. In June 1930 he was operated on. The gallbladder was found to be normal with no adhesions. There were dense adhesions between the hepatic flexure and the liver. Beneath these the great omentum was plastered to the upper surface of the pylorus and the under surface of the liver. Beneath these there was an area on the prepyloric surface of the stomach, one-half inch in diameter, surrounded by an area of redness and infiltration. Palpation through the stomach wall revealed the crater of an ulcer in the area of redness. In the gastro-hepatic omentum was a lymph gland, intensely hard and about the size of a buck shot. Under local anesthesia a "Finney" pyloroplasty, including the ulcer and a considerable area around it in the incision, was performed. The lymph gland was also excised. From all indications this appeared to be a case of prepyloric ulcer but the pathologic examination showed in the sections of the ulcer "evident induration which was the result of dense overgrowth of connective tissue, everywhere diffusely, and near the surface focally, infiltrated with leukocytes. There was no evidence of epithelial infiltration, and the gastric mucosa on each side of the ulcerated area appeared normal. The lymph

TABLE 6.—*Premonitory Symptoms in Thirty-One of Thirty-Nine Cases, Jan. 1, 1936, to Jan. 1, 1939*

No.	Age	Sex	Character of Symptom
1	65	♂	Dull ache 1 year
2	54	♂	Lumbosacral pain, 5 months
3	50	♀	Nausea and pain, 17 months
4	70	♂	Operation for stomach trouble 8 months ago
6	71	♂	Sickness 3 years
7	50	♀	Nausea and vomiting, 5 months
8	52	♀	Right upper abdominal pain, 4 years
9	69	♀	Peptic ulcer 10 years ago
11	77	♀	Indigestion 17 years
12	52	♂	Bloating and belching 3 years
15	70	♂	Nausea 2 years
16	63	♂	Gas on stomach 6 months
17	64	♂	Distress 1 year
18	72	♂	Weakness 7 months
19	79	♂	Pain 7 months, relieved by eating
21	65	♂	Indigestion 5 years
22	65	♂	Diarrhea 16 months
23	42	♀	Pain 4 years
24	70	♀	Palpitation 2 years
25	45	♀	Vomiting and distress 1 year
26	59	♂	Sore spot in stomach 20 years
27	58	♀	Cholecystectomy 5 to 6 years ago; pain not relieved
28	69	♂	Dyspepsia 20 years
29	68	♀	Weakness past several years
31	73	♂	Vomiting, pain, loss of weight 4 months
32	60	♀	Weakness, loss of weight, 6 months
33	53	♂	Weakness 18 months
34	52	♂	Pain and weakness 4 years
36	74	♂	Abdominal pain 30 years
37	73	♂	Ulcer pain 13 years
38	55	♀	Weakness, loss of weight, 1 year

gland told another story; despite its small size it showed the presence of numerous masses of undelimited epithelial cells, in part with a fairly definite tubular arrangement, in part as utterly unformed groups. Despite the negative evidence of the sections directly through the ulcer there was undoubtedly carcinomatous change somewhere in the ulcer." This patient is still living at the age of 70 and still carrying on his work as an educator. His stomach, as that of the previous patient, showed considerable deformity at the pyloric region on x-ray examination one year ago, but it is functioning sufficiently well to carry on approximately normal gastric digestion.

The point brought out by the three cases I have cited is that even with the abdomen open and the stomach accessible to sight and feel it is extremely difficult to differentiate between benign gastric ulcer and early carcinoma. For this reason I advocate the removal of prepyloric ulcer, in whatever portion of the stomach it is situated, by the method applicable to the individual case with or without gastric drainage by gastro-enterostomy. In the early stage, with the patient in good condition, the operation does not carry a high mortality and removal of the ulcer and the surrounding area is radicalism on the side of safety.

CONCLUSIONS

The development of surgery initiated by the discovery of anesthesia and asepsis has passed through two definite phases and we should now be entering on its third phase.

The first phase was that of anatomic surgery. The attention of surgeons was directed toward developing methods of attack on the different organs of the body. During this phase the various operations were devised and surgical thought was directed almost exclusively to anatomic and mechanical methods.

The second phase was ushered in by the increase in the knowledge of bacteriology and biochemistry. The condition of the patient's body was more carefully evaluated, and preoperative and postoperative care of the patient as a whole was taken into consideration. The physiology of the different organs of the body was studied and surgical attack directed toward conditions which were previously out of reach because of the inability of the unprepared patient to stand the shock of surgical attack.

The third phase, into which we are now entering, is the phase of preventive surgery. The great mass of evidence accumulated over the past three quarters of a century has shown definite conditions amenable to surgical attack which we know, if left alone, will result in serious disability, if not death, in a moderately short time. In this group can be placed thyroid disease, which tends constantly to become more and more severe. Gallbladder disease, which tends to create economic inefficiency in later life, also may be included. The wisdom of surgical removal of the various so-called precancerous conditions is now recognized. It would appear from the evidence offered by this study, as well as by that offered by others, that gastric ulcer belongs to this group if we are to succeed in the surgical cure of cancer of the stomach.

Cancer of the stomach sufficiently advanced that a definite diagnosis of cancer can be made is, as shown by this series and series reported by others, a condition which is practically incurable by surgical treatment. Recurrences are common. In many cases metastases exist which cannot be recognized at operation. At best, in the advanced case, operation gives the patient only a few more months of life. In the majority of cases life is made more comfortable and consequently operation is justified.

The accepted method of cure, if the word can be used of carcinoma of any form, is the early removal of the growth itself with the removal of adjacent lymph glands. From the standpoint of the surgeon the treatment of carcinoma of the stomach consists in the removal of gastric lesions which we know may result in carcinoma during the stage when, if carcinoma is already present, it is in an early stage and localized in the stomach and adjacent glands.

1618 Medical Arts Building.

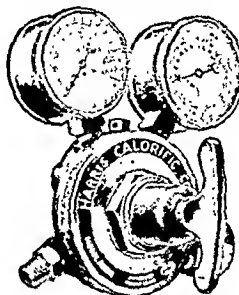
Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
HOWARD A. CARTER, Secretary.

HARRIS OXYGEN REGULATORS, No. 92SC ACCEPTABLE

Manufacturer: The Harris Calorific Company, 5505 Cass Avenue N.W., Cleveland.

The Harris Oxygen Regulator, No. 92SC, is used to meter the flow of oxygen into tents, catheters, anesthesia apparatus or similar oxygen therapy chambers. It is a two-stage regulator, which is designed, in contradistinction to single-stage regulators, to reduce pressure in two steps.



Harris Oxygen Regulators
#92SC.

The firm claims that this type of apparatus is more efficient than a single-stage regulator, in which the high pressures encountered in the oxygen cylinders are both held and controlled at one point, namely where the nozzle meets the seat. It is stated that this dual function cannot be efficiently maintained by one such control. That is, in the two-stage mechanism a more steady and rigid means may be provided to "hold" the pressure by means of a separate first stage, and a more

accurate and stable control is made possible by the presence of a second stage. The first is achieved by a metallic diaphragm set to hold the pressures roughly at from 150 to 200 pounds. Gas at this pressure is then led into the second stage, where a flexible diaphragm functions in connection with a seat to regulate the gas more accurately. Furthermore, it is said that this second stage diaphragm is so made that no harm would ensue if a nurse should inadvertently leave the second stage seat open and then open the valve on the oxygen cylinder, allowing 2,000 pounds of gas pressure to rush directly onto the more delicate second stage diaphragm.

In this unit there is also a screen through which gas entering the regulator is subjected to filtering prior to entering the high pressure gage and the seat. A safety valve has been provided to vent to the atmosphere undesirably high gas pressures. The noise of the operation of the unit has also been reduced to a minimum.

The firm submitted tests made in its engineering department to substantiate claims that the regulator will hold and accurately control 2,000 down to 100 pounds pressure. The delivery per minute was set at 20, and the results were as follows:

Oxygen Cylinder Pressure Lbs. per Sq. In.	Delivery Liters per Minute
2,000.	10
1,800	10
1,600	9.9
1,400	9.8
1,200	9.7
1,000	9.6
800	9.5
600	9.4
400	9.5
300	9.7
200	10.1
150	10.5
100	10.8

Evidence obtained by the Council for the clinical value of the unit demonstrated that it performed adequately and in accordance with the claims of the firm.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Harris Oxygen Regulators, No. 92SC, for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
PAUL NICHOLAS LEECH, Secretary.

BISMUTH ETHYL CAMPHORATE (UPJOHN COMPANY)

Preliminary Report of the Council on Pharmacy and Chemistry

The Upjohn Company presented for the Council's consideration, Bismuth Ethyl Camphorate, stated to be a liposoluble bismuth salt of ethyl camphoric acid having the formula $(C_8H_{11}COOC_2H_5COO)_2Bi$. The preparation is proposed for intramuscular injection to obtain the systemic effects of bismuth in the treatment of syphilis. The proposed adult dose is 1 cc. by intramuscular injection for a course of twelve injections. The firm states that the drug is usually administered in courses alternating with arsenic preparations. It is marketed in ampules of 1 cc. and vials of 30 cc., each cubic centimeter containing 40 mg. of elemental bismuth, 0.010 Gm. of camphor and 0.025 cc. of benzyl alcohol dissolved in sweet almond oil. These dosage forms have not been checked by the Chemical Laboratory of the American Medical Association.

The Upjohn Company submitted evidence to show that the minimum lethal dose for the bismuth-methyl-camphorate was 350 mg. of metallic bismuth per kilogram of rat, while that for bismuth-ethyl-camphorate was 250 mg. of metallic bismuth per kilogram of rat.

The firm submitted a reprint entitled "Bismuth Ethyl Camphorate, clinical observations on a new oil soluble bismuth in the treatment of syphilis," by Francis M. Thurmon representing work done in the Department of Dermatology and Syphilology and the Division of Research of the Boston Dispensary. The statement is made that oil soluble preparations possess an optimum rate of absorption and elimination and a superior ability to penetrate the tissues. No proof for this statement is given. Investigation included 230 patients who received 2,444 intramuscular injections, extending over a period of eighteen months. There were nineteen patients with primary lesions, thirty-six with secondary, ninety-one with tertiary asymptomatic, sixty-three with tertiary symptomatic, and twenty-one with congenital syphilis. There were 146 males and eighty-four females (of the latter fourteen were pregnant). Each patient had frequent chemical and microscopic studies of the urine. Occasionally phenolsulfonphthalein excretion tests were used, and determinations of the nonprotein nitrogen and urea content of the blood were carried out. Likewise, complete blood counts, icteric index and like tests were made in numerous instances. In these tests no significant variations from normal were observed which might be attributed to Bismuth Ethyl Camphorate. It was found that the patients best tolerated the 1 cc. dose of the compound given intramuscularly. Higher doses of 1.5 cc. and 2 cc. were well tolerated by some patients, while others manifested local pain, gingivitis, occasionally a mild dermatitis, and seldom evidence of a transient renal irritation.

The technic employed in the foregoing clinical study consisted, in early syphilis, in each patient receiving three injections of an arsphenamine for the first two weeks, two injections a week for the next two weeks and one injection a week for the succeeding two weeks, so that at the end of the first six weeks of treatment each patient had received twelve intravenous injections. Then without a rest period intramuscular therapy was instituted, the patients receiving an injection of bismuth ethyl camphorate at seven day intervals for a total of twelve injections. Following this the patient was once more put back on the arsenical therapy, and this continuous alternation of courses was kept up until the patient had received thirty-six injections each of an arsenical and of a bismuth preparation. The seventy-two injections were considered the minimum therapy for any patient with primary or secondary syphilis.

The author states that occasionally prolonged treatment with bismuth ethyl camphorate was necessary because of sensitivity to other preparations, so that twenty-one patients received from fifteen to twenty consecutive injections, and another group of

fifteen patients received from twenty to twenty-five injections without toxic effect. One patient, a man aged 20, sensitive to all arsenicals, developed an acute interstitial keratitis, for which he received twenty-nine consecutive injections without toxic effect and with a clearing of the eye situation in six weeks. In fourteen cases of pregnancy, five of them in the secondary stage in which it was possible to administer treatment through the last five months of pregnancy, each of the patients produced a full-term child without stigmas of congenital syphilis.

The firm submitted a table comparing the toxic effects of bismuth ethyl camphorate with that of bismuth subsalicylate. According to this table, if anything, more toxic effects were noted from bismuth subsalicylate than from bismuth ethyl camphorate, there being a comparison of 230 cases under the bismuth ethyl camphorate, with 180 under the bismuth subsalicylate. As to local irritation from the preparation, in only eight instances of the 230 was it necessary to transfer the patient to some other form of treatment. It is stated that during the early period of the study when larger amounts of the drug, from 60 to 80 mg., were used, the drug seemed to possess potential possibilities of toxicity. Later and more complete evidence would indicate that Bismuth Ethyl Camphorate can be used in 2 cc. (80 mg.) doses, as are other liposoluble compounds on the market, though one consultant reports that some of the patients under such a regimen develop a bismuth line within a matter of two or three weeks. Otherwise there seems to be no reason why a 2 cc. dose should not be considered safe.

No studies were submitted on the absorption and elimination of this product. Evidence is presented to show that it is impossible by means of x-ray examination to study the rapidity of absorption of Bismuth Ethyl Camphorate when administered intramuscularly. The x-ray films show no evidence of any opaque material.

The Upjohn Company was informed that the Council has already gone on record as being opposed to development of further bismuth preparations for the treatment of syphilis unless they represent something new and of an unusual type. Bismuth ethyl camphorate can hardly be called a new or unusual type of preparation. Sufficient data are not furnished to allow proper evaluation of the effectiveness of this product in the treatment of syphilis. Studies on the absorption and elimination of the preparation in human subjects are lacking. Some data are furnished on animals. It is understood that the investigation of the former is in progress. For one of the first requisites to evaluation of an antisiphilitic preparation, the rapidity of disappearance of spirochetes from primary and secondary lesions, insufficient data are at hand. Thus far they consist of but one case of Dr. Carroll Wright's, in which the spirochetes disappeared from a penile chancre in approximately sixty hours, and eight cases submitted by Dr. Francis Thurmon, the spirochetes disappearing from the primary lesions in one, two and three days respectively, and from secondary lesions, several of them being extensive condylomas, in extremes of two and fourteen days, with a mean of thirteen days. In view of the lack of sufficient data to warrant inclusion in N. N. R. at this time, the Council authorized publication of the foregoing preliminary report.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SULFANILAMIDE (See New and Nonofficial Remedies, 1939, p. 463).

Tablets Sulfanilamide, 5 grains.

Prepared by Smith-Dorsey Co., Inc., Lincoln, Neb. No U. S. patent or trademark.

IMMUNE GLOBULIN (HUMAN) (See New and Nonofficial Remedies, 1939, p. 412; THE JOURNAL, April 1, 1939, p. 1257).

The National Drug Co., Philadelphia.

Immune Globulin (Human).—Also marketed in packages of one 2 cc. ampule-vial and in packages of one 10 cc. ampule-vial.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 21, 1939

HEAD INJURIES

In recent years two dominant influences have prevailed in the treatment of trauma to the brain. The first is the demonstration of the four classic stages of brain compression by Kocher and Cushing. The second is the observation of Weed and his collaborators that increased intracranial tension can be influenced by changing the osmotic pressure of the blood through the agency of hypertonic and hypotonic solutions. The treatment of cerebral injuries has been designed also on the concept that cerebral compression is the prime factor in the production of the symptoms. The application has resulted in treatment by cerebral decompression—by lumbar puncture and by dehydration. Thus Battle,¹ after a recent study of 200 cases of traumatic injuries of the head, has reported that the lowest mortality in the seriously injured occurred in the cases treated by repeated lumbar punctures and dehydration.

Now, however, comes evidence that the postulates on which therapy has rested are neither wholly complete nor wholly accurate. Shapiro and Jackson,² for example, in studies of normal human brains and those which had suffered traumatic injury, found that in the traumatized head the brain is swollen but not edematous. This swelling is not due to increased water but to increased blood content, although the ventricular fluid is increased in the presence of internal traumatic hydrocephalus. The lines of therapeutic effort suggested by their study show, these investigators believe, that lumbar puncture and dehydration are indeed indicated but have probably been carried as far as possible. Ventricular drainage may be useful but emphasis may be placed on measures to reduce parenchymatous hemorrhage within the brain substance. Similarly, Browder and Meyers³ have previously expressed inability to interpret clinically the altered brain functions of many traumatic cases in

terms of the classic teachings. This led to their investigation of the behavior of the blood pressure, pulse, respiration, state of consciousness and cerebrospinal fluid pressure following craniocerebral injury. Measurably increased intracranial tension rarely, however, produced the classic pattern of signs; they therefore expressed the conviction that, whether singly or in combination, the blood pressure, pulse rate, respiratory rate and state of consciousness cannot be reliably regarded as an index of intracranial tension. Three lines of evidence concerning the factor of cerebral compression—that derived from observations on the behavior of the systemic blood pressure, pulse and spinal fluid pressure following craniocerebral injury; that from alterations in vital signs associated with changes in intracranial tension experimentally produced by an external pressure agent, and that from the alterations in vital signs associated with changes in intracranial tension experimentally produced by the application of an intraventricular pressure agent—lend strong support to the view that the changes in the constitutional, neurologic and psychologic states of patients showing evidence of severe trauma of the brain are not applicable in terms of increased intracranial tension per se.

Their extensive experiments on this problem⁴ involved also observations on the effects of various hypertonic solutions on the intracranial tension as measured by the cerebrospinal fluid pressure and aerographic roentgenologic studies of the head in relatively new injuries demanding prompt and precise diagnosis as a basis for therapy. All these observations point to the conclusion that the traditional account of the manifestations of craniocerebral trauma in terms of brain compression cannot be reconciled in the majority of cases with the data derived from clinical, pathologic and experimental investigations. The evidence available rather indicates the necessity of experimental inquiry into the nature of the more subtle pathologic intracerebral disturbances, particularly of the derangements of the physiochemical constitution of nerve cells and their processes. Until precise knowledge along such lines is acquired, Browder and Meyers say, bringing with it an understanding of the pathogenesis of the majority of severe cerebral injuries comparable to that at present possessed in connection with epidural, subdural and intracerebral hemorrhages, just so long will treatment remain empiric. The proper management of a head injury, they say, requires the clinician to determine whether or not there are present any lesions such as depressed fractures of the vault and epidural, subdural or intracerebral hematomas. These alone are benefited by surgical procedures. Other pathologic processes call for the institution of supportive measures. Differential diagnosis is often rendered difficult by the frequent coexistence of generalized cerebral insult with

1. Battle, Newsom P.: Traumatic Injuries to the Head, *Am. J. Surg.* 43: 66 (Jan.) 1939.

2. Shapiro, Philip, and Jackson, Harry: Swelling of the Brain in Cases of Injury to the Head, *Arch. Surg.* 38: 443 (March) 1939.

3. Browder, Jefferson, and Meyers, Russel: Observations on Behavior of the Systemic Blood Pressure, Pulse and Spinal Fluid Pressure Following Craniocerebral Injury, *Am. J. Surg.* 31: 403 (March) 1936.

4. Browder, Jefferson, and Meyers, Russel: A Reevaluation of the Treatment of Head Injuries, *Ann. Surg.* 110: 357 (Sept.) 1939.

surgically amenable conditions. In such cases cerebral aerography may help to clarify the diagnosis. Certainly the severe traumatic head injuries still constitute a sufficiently dangerous group to necessitate extensive further studies on the pathophysiology in order to furnish a foundation on which to base more rational and effective therapy than is at present available.

POTASSIUM IN MUSCLE

The concentration of the electrolytes in the various tissues of the body is maintained by a variety of intricate mechanisms, not all of which are well understood. The electrolytes of muscle, in particular, have attracted much attention; the extensive literature covering research studies made in this field was recently reviewed by Fenn.¹ The important observations of numerous investigators which give evidence that under certain conditions muscles lose potassium on stimulation have made studies concerning this element of special interest. A recent investigation by Heppel,² who used potassium deficient rations, is noteworthy because it adds to our knowledge of the interrelations of potassium and sodium in muscle. Restriction of rats to such an experimental diet results in a striking alteration in the potassium and sodium content of their muscular tissues. As compared to normal animals, those deprived of potassium show a decrease of almost 50 per cent in the potassium of muscle and a concomitant rise in the level of sodium; indeed, in some cases the muscles become richer in sodium than in potassium. Particularly worthy of note is the observation that in the muscles of the deficient animals most of the sodium is confined to the intracellular phase, whereas it is known that in the muscles of normal rats almost all the muscle sodium can be assigned to the extracellular space. It might be recalled here that Eppright and Smith,³ in a study of the changes in the water of tissue induced by diets containing various mineral supplements, also reported the probable occurrence of intracellular sodium in the muscles of rats under a particular dietary regimen.

Although the livers of rats deprived of potassium examined by Heppel showed no large changes in the electrolyte picture, the possible importance of the liver in the potassium economy of the body is suggested by the recent work of Fenn.⁴ He has reported the results of an extensive study which was carried out to determine the fate of potassium liberated from muscles during activity. His observations indicate that the liver is involved in a manner not suspected heretofore. The blood, muscles and other tissues of cats were analyzed for water and potassium before and after stimulation

of certain muscles. The data show that one hour after stimulation the increase in potassium concentration in the blood is such as to indicate that more than half of this element is no longer located in the interstitial or circulatory fluids but must have penetrated into some cells of the body. Analysis of the liver indicates that this organ takes up 31 per cent of the potassium liberated from active muscles, although it accounts for less than 3 per cent of the body water.

The experiments would seem to indicate that a part of the potassium liberated by muscular activity is taken up by the liver; in recovery the reverse change occurs, since it has been shown that the muscle regains the potassium which it has lost. Thus there are indications of a potassium cycle that is somewhat comparable to the classic carbohydrate cycle, the potassium being possibly transported as potassium lactate. As recognized by Fenn, additional evidence is needed before the existence of such a cycle can be stressed. However, if further work proves that this cycle exists, the importance of the discovery to our knowledge of tissue electrolytes is evident. The involvement of the liver in the cycle would also serve to emphasize once more the manifold function of this organ in metabolism.

HEMOCONCENTRATION AS A DIAGNOSTIC SIGN OF SHOCK

Observations on shock during the World War seemed to show that substances absorbed from injured tissues were responsible for the circulatory failure which followed. The British Medical Research Council organized an investigation on the nature and appropriate treatment of shock. Eminent surgeons, physiologists and pharmacologists of England, France and the United States cooperated in this endeavor. The accumulated experience and experimental evidence, summarized by Cannon, indicated that secondary shock is due to a toxic factor absorbed from injured tissues which causes an increase in permeability of the capillary walls and a consequent reduction in blood volume through the escape of plasma into the tissues. In a large series of cases of hemorrhage and of shock in which hemorrhage was insignificant, Cannon, Fraser and Hooper¹ found that the blood showed dilution in the former proportional to the amount of blood lost, while in the latter there was concentration of the blood. The first noteworthy feature in severe traumatic shock was a high red cell count. These investigators attributed this phenomenon to stasis of blood in capillary areas, accompanied by transudation of the plasma into the tissue spaces, with resulting concentration of the corpuscular elements of the blood. The hemoconcentration was progressive and tended to be proportional to the degree of shock.

1. Fenn, W. O.: *Physiol. Rev.* **16**: 450 (July) 1936.
2. Heppel, L. A.: *Am. J. Physiol.* **127**: 385 (Sept.) 1939.
3. Eppright, E. S., and Smith, A. H.: *Am. J. Physiol.* **121**: 379 (Feb.) 1938; *J. Biol. Chem.* **118**: 679 (May) 1937.
4. Fenn, W. O.: *Am. J. Physiol.* **127**: 356 (Sept.) 1939.

1. Cannon, W. B.; Fraser, John, and Hooper, A. N.: *Some Alterations in the Distribution and Character of the Blood*, *J. A. M. A.* **70**: 526 (Feb. 23) 1918.

Knowledge concerning the function and reactions of the capillaries has been extended since the World War. It has been shown (Ebbecke,² Lewis³) that normal cytoplasmic substance, released from cells by injury of any kind, causes dilatation and increased permeability of capillary endothelium. Cytoplasm is not toxic in the sense commonly implied by that term. According to Moon,⁴ secondary shock is the result of capillary atony caused by many agents, such as cytoplasmic substances, anoxia, certain chemicals, metabolites and various protein substances. The phenomena which accompany capillary atony are hemoconcentration, dilatation, stasis and permeability of capillary endothelium. These result in a decrease in both the actual and the effective blood volume. The volume flow is thereby reduced and deficient delivery of oxygen causes tissue anoxia. Capillary dilatation combined with loss of plasma volume causes disparity between the volume of blood and the volume capacity of the vascular system. For a time arterial constriction will compensate this disparity. This compensation is at the expense of volume flow. The peripheral parts become relatively bloodless and vital organs suffer lack of oxygen. When this mechanism of compensation is no longer effective, the blood pressure declines progressively. At this stage the condition is usually irreversible.

Moon and his associates claim that shock is accompanied regularly by hemoconcentration, and they have adopted hemoconcentration as a criterion rather than changes in blood pressure. They produced shock in dogs without hemorrhage or trauma by introducing muscle substance intraperitoneally, by injecting extracts of tissue, by injecting bile and by other procedures. Hemoconcentration was a regular feature in all the experiments, sometimes developing within an hour after implantation of muscle. It occurred before the arterial blood pressure began to decline and was progressive. The degree of concentration was proportional to the apparent illness of the animal. A condition of collapse, relaxation and stupor preceded death.

Moon and his associates found that hemoconcentration develops gradually after severe trauma, operations, intestinal obstructions and burns but that it results immediately after the injection of bile, peptone, histamine, emetine and other substances which cause damage to endothelium. A rise from 5,000,000 to 6,000,000 red cells represents a concentration of 20 per cent. Such a result, according to Moon, indicates that the total blood volume has been reduced about 10 per cent and the plasma volume about 20 per cent. A hemoconcentration of 20 per cent is ominous, for it indicates that the mechanism of shock is in operation even though no decline in arterial pressure or other evidence of circulatory deficiency is shown.

Moon⁵ points out that hemorrhage and shock may be differentiated readily by observations made on the concentration of the blood. A loss of blood by hemorrhage results in dilution of the blood because fluid is absorbed rapidly from the tissues to restore the blood to its normal volume. The hemodilution is proportional to the amount of blood lost. Moon compared the hemoconcentration with blood pressure readings in a number of clinical cases during the development of circulatory deficiencies of the shock type. In each instance, examination of the blood forecast the development of the shock from several hours to several days before the blood pressure declined notably. He therefore concluded that arterial blood pressure is not an accurate criterion of the presence of shock. The latter may be present while the blood pressure is well maintained or when it is even at its highest recorded point. Hemoconcentration is progressive; it is an index of the degree of shock, and it subsides to normal as shock is abated. Hemoconcentration is therefore offered as the earliest clinical sign of shock. It is easily detected, is regularly present before other signs appear and results from the same mechanism that causes shock.

Current Comment

MASSACHUSETTS COMES CLEAN

At long last the Commonwealth of Massachusetts has taken measures for the protection of its citizens in medical affairs comparable to those of other states. For years the output of graduates of low grade medical schools unable to obtain licenses in any other state has flocked to Massachusetts. Two such schools not recognized in any other state have flourished almost under the shadow of the State House. In theory people were protected by the licensing examination; it is well known, however, that competence to practice medicine cannot be determined by a written examination alone. A written examination might as well be expected to test ability to paint a picture or to shoe a horse. The state has provided no machinery for a practical examination, which is the only kind of examination worth while in ascertaining fitness for medical practice. Now, however, by the Acts of April 30, 1936, and May 2, 1938, amending section two of chapter 112 of the General Laws, it has been decreed that no one may enter the licensing examination who is not a graduate of an "approved" medical school. There has also been created an "Approving Authority" which is to determine on request whether any medical school fulfils the requirements formulated and published by it. The way is now clear to enforce a standard for admission to the practice of medicine at least as high as the standards prevailing generally throughout the United States. After 1941 Massachusetts should cease to be the dumping ground of unqualified practitioners.

2. Ebbecke, Ulrich: Ueber Gewebsreizung und Gefässreaktion, Arch. f. d. ges. Physiol. 199: 197, 1923.

3. Lewis, Thomas: Blood Vessels of the Human Skin and Their Responses, London, Shaw & Sons, 1927.

4. Moon, V. H.: Shock and Related Capillary Phenomena, New York, Oxford Press, 1938.

5. Moon, V. H.: Early Recognition of Shock and its Differentiation from Hemorrhage, Ann. Surg. 110: 260 (Aug.) 1939.

SUPPLY OF OPIUM IN THE
UNITED STATES

According to official reports, opium and its derivatives are now available in the United States in quantities sufficient to meet legitimate medicinal requirements for about three years. Disturbed conditions in Europe and the Orient afford, therefore, no justification for purchasing and hoarding supplies of these drugs, either by physicians, hospitals, wholesale druggists or pharmacists. Narcotic peddlers, however, who cater unlawfully to addicts, seem to feel already the pinch of restricted transoceanic commerce. The importation of opium and its derivatives by international smugglers apparently has diminished along with the number of vessels engaged in transoceanic commerce. The increasing difficulty of obtaining narcotics to satisfy the demands of addicts probably accounts for the increase in the number of thefts of narcotics from physicians' offices and from pharmacies. Addicts and peddlers who cater to them are likely to resort with increasing frequency to this method of replenishing their stocks. Physicians, pharmacists and institutions who may legitimately possess narcotic drugs should take extra precautions to prevent their being stolen. Access to such drugs should be limited to the smallest possible number of persons. In event of theft of narcotics, the person from whom they were stolen should make immediate report in writing to the local police and also to the narcotic agent in charge of the district in which the theft occurs. Such reports are necessary for physicians in presenting a correct inventory of their narcotic supplies when called on to do so.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Annual Symposium on Heart Disease.—The tenth annual postgraduate symposium on heart disease, given by the heart committee of the San Francisco County Medical Society, will be held at the University of California Hospital, Stanford University Hospital and San Francisco Hospital, San Francisco, November 16-18. The course will include demonstration of patients, ward rounds and special instruction in roentgen examination and electrocardiography. At the dinner meeting the opening night Dr. William Dock, professor of pathology at Stanford, will speak on "The Treatment of Heart Disease Since Queen Bess."

Resolutions of an American Legion Post.—Service Clubs Post No. 546 of the American Legion of the Department of California, at Los Angeles, comprising mostly men of executive rank in their own organizations who are former officers in the military service, has unanimously adopted two resolutions. In the first resolution, the post stated that military mobilization would require thousands of doctors and, since only about 20 per cent of those applying for admission to medical schools at present are admitted, in selecting students for admission to medical schools adaptability for military service should be considered along with the other requirements; that R. O. T. C. graduates be given preference if otherwise equally qualified; also that the number of admissions to medical schools annually should be increased to provide enough doctors of medicine to serve the military forces in time of war and leave a surplus sufficient to serve the needs of the civilian population. The other resolution adopted by the post provided that further to improve the medical department of the U. S. Army

and Navy a study be made to determine the feasibility of requiring all applicants for admission to the dental corps to be doctors of medicine specializing in dentistry. This resolution pointed out that at present in the medical department of the U. S. Army and Navy there are about 400 officers of the dental corps whose professional training is along the lines of medical officers but whose effectiveness is limited almost entirely to their technical ability.

COLORADO

Annual Session.—The Colorado State Medical Society will hold its annual session in Glenwood Springs Sept. 11-14, 1940, with headquarters at the Hotel Colorado.

Society News.—Dr. John Alexander, Ann Arbor, Mich., discussed "Surgery of Bronchiectasis and Abscess of the Lung" before the Medical Society of the City and County of Denver October 3. Dr. Elliott P. Joslin, Boston, addressed the society September 3 on "Treatment of Diabetes—1898-1939."—The Pueblo County Medical Society was addressed September 19 by Dr. Arthur J. Markley, Denver, on "Basic Factors of the Syphilis Control Program." Dr. Paul S. Wolfe addressed the society recently on craniocerebral injuries.

CONNECTICUT

Changes in Health Officers.—The *Connecticut Health Bulletin* announces the following changes in health officers: Dr. Homer C. Ashley, New Hartford, of Barkhamsted, filling the vacancy caused by the resignation of Marshall Case; Dr. Norman H. Gardner, East Hampton, succeeding Dr. John D. Milburn, resigned; Dr. Howard S. Allen of Woodbury, succeeding Dr. Frank Reichenbach, and Dr. William L. Higgins, South Coventry, of Columbia.—Dr. Daniel E. Shea, formerly director of the bureau of venereal diseases of the Hartford department of health on a part time basis, has been appointed full time director.

Society News.—The Yale Medical Society was addressed in New Haven October 11 by Walter R. Miles, Ph.D., on "The Polarity Potential of the Human Eye"; Dr. Robert M. Thomas and Frederick Dessau, "Experimental Tuberculosis in Mice"; Bert G. Anderson, D.D.S., "Developmental Enamel Defects; Clinical Descriptions and Classification," and Robert M. Lewis, "Use of a Synthetic Preparation Replacing Estrin."—Dr. Milton C. Winternitz, New Haven, addressed the Fairfield County Medical Association in Greenwich October 17 on "Infecting Agencies and Pathology."—At a joint meeting of the Hartford Medical Society and the Hartford County Medical Association October 16 Dr. Foster Kennedy, New York, discussed "Emotional Unrest in a Restless World."

ILLINOIS

New District Health Units.—The state department of health announces the establishment of four new district health units. There are now nineteen of these units offering full time service to ninety-six of the 102 counties in the state. The medical officers in charge of the new units are Drs. Abraham J. Levy, Gilman; Cecil A. Z. Sharp, Macomb; Clair L. Jolins, Mount Sterling, and Jerome J. Sievers, Pana.

Symposium for Industrial Nurses.—The first annual symposium for industrial nurses will be presented by the state department of public health at the University of Illinois College of Medicine, Chicago, October 26-28. Collaborating organizations are Chicago Industrial Nurses Association, Greater Chicago Safety Council, Illinois Manufacturers Association, American Industrial Hygiene Association, American Medical Association and the University of Illinois College of Medicine.

Society News.—At a meeting of the Adams County Medical Society in Quincy September 11 Dr. Nathan S. Davis III, Chicago, spoke on "The Care of the Aged."—Dr. Carolyn N. MacDonald, Chicago, addressed a public meeting in Charleston September 28 on "The Importance of Prenatal Care"; the meeting was sponsored by the Coles-Cumberland County Medical Society and the Charleston Woman's Club.—At a meeting of the Rock Island County Medical Society in Rock Island September 26 Dr. Abraham F. Lash, Chicago, discussed "Prevention and Treatment of Abortion."—Dr. Archibald L. Hoyne, Chicago, discussed scarlet fever before the Kankakee County Medical Society at Kankakee September 14.—At a meeting of the Bureau County Medical Society September 12 in Princeton Dr. Roger T. Vaughan, Chicago, discussed "Differential Diagnosis and Treatment of Acute Abdominal Lesions."—Dr. William J. Morginson, Springfield, addressed the Christian County Medical Society, September 6, on "Diagnosis and Treatment of Some Common Skin Diseases."

Chicago

The Belfield Lecture.—Dr. Samuel R. Meaker, professor of gynecology, Boston University School of Medicine, will deliver the eleventh annual William T. Belfield Memorial Lecture of the Chicago Urological Society at the Palmer House October 26. His subject will be "Male Infertility from a Gynecologic Viewpoint."

Society News.—At a meeting of the Chicago Pathologic Society October 9 the speakers were, among others, Dr. Samuel A. Levinson, who delivered the presidential address on "History and Progress of the Scientific Work of the Cook County Coroner's Office" and Dr. Edith L. Potter, "Disseminated Ganglioneuroblastoma in a Stillborn Fetus."—Dr. Walter C. Alvarez, Rochester, Minn., addressed the Chicago Society of Allergy October 16 on "Gastrointestinal Allergy" and Dr. Charles K. Maytum, Rochester, Minn., spoke on "Oxygen Therapy and X-Ray Therapy in Asthma."—At a meeting of the Chicago Pediatric Society October 17 Drs. Arthur F. Abt and Heyworth N. Sanford spoke on "Hemolytic Disease in Infants" and "Nuclear Icterus" respectively.—The Chicago Gynecological Society was addressed October 20, among others, by Drs. Eustace L. Benjamin and William C. Danforth, Evanston, Ill., on "Bipartite Uterus" and Robert M. Grier and Herbert O. Lussky, Evanston, Ill., "Premature Infant Mortality."

INDIANA

Memorial to Physician.—A memorial to the late Dr. St. Clair Darden, South Bend, superintendent of Healthwin Hospital from 1920 to 1932, was unveiled recently. The monument is a large granite boulder, bearing a bronze plaque, given by persons who attended Camp Darden. Dr. Darden died Nov. 15, 1932.

Marihuana Eradication.—A program of eradication of marihuana and education of the public to the dangers of the weed has been launched in Indiana by Dr. Verne K. Harvey, secretary, state board of health, in compliance with a recent law. Gene Ryan, Indianapolis, formerly a state police detective, has been appointed state narcotic inspector in charge of marihuana eradication and enforcement.

MASSACHUSETTS

Society News.—Gregory Pincus, Sc.D., visiting professor of experimental zoology, Clark University, Worcester, discussed "Sex Hormones in Cancer" before the Worcester District Medical Society in Worcester September 13.—At a meeting of the Pentucket Association of Physicians September 14 in Haverhill, Dr. William Dameshek, Boston, spoke on "Lessons from the Blood Applicable to Problems of the General Practitioner."

The New England Postgraduate Assembly.—The New England Postgraduate Assembly, sponsored by the state medical societies of Massachusetts, New Hampshire, Rhode Island, Maine and Vermont, will be held at the Sanders Theater, Harvard University, Cambridge, October 31–November 1. Lecturers will include:

Dr. Jesse G. M. Bullock, New York, Basis of Specific Therapy in the Management of the Pneumonias.
Dr. Roscoe R. Graham, Toronto, Ont., Canada, Chronic Cholecystitis.
Dr. Albert C. Furstenberg, Ann Arbor, Mich., Acute Suppurations of the Mouth and Pharynx.
Dr. James S. McLester, Birmingham, Ala., The Role of the Vitamins and Other Essential Substances in Human Nutrition.
Mr. H. H. Clegg, federal bureau of investigation, U. S. Department of Justice, Washington, D. C., The War on Crime.
Dr. Benjamin W. Carey, Detroit, Pyelitis in Children.
Dr. Eldridge L. Eliason, Philadelphia, Team Work in the Treatment of Gallbladder Disease.
Dr. Joseph E. Moore, Baltimore, Latent Syphilis.
Dr. Harvey B. Matthews, Brooklyn, Pelvic Infection: Diagnosis and Management.
Dr. Maurice C. Pincoffs, Baltimore, Clinical Varieties of Hypertension.
Dr. Charles C. Higgins, Cleveland, Prevention of Recurrent Renal Lithiasis.
Sir Thomas Lewis, Rickmansworth, England, Venous Congestion and Its Measurement.

MICHIGAN

State Medical Election.—Dr. Paul R. Urmston, Bay City, was chosen president-elect of the Michigan State Medical Society at its recent annual session and Dr. Burton R. Corbus, Grand Rapids, was installed as president.

Goiter Prevention.—A statewide educational program to promote the use of iodized salt as a preventive of simple goiter is being sponsored this month by the state department of health, the state medical society and the Salt Producers Association of Michigan. The work will be carried on prin-

cipally through the schools. Physicians, health officers and nurses who wish copies of the folder "Michigan Children Need Iodized Salt" for distribution may obtain them from the state department of health, Lansing.

The Max Ballin Lectures.—The North End Clinic, Detroit, announces the Dr. Max Ballin Memorial Lectures to be given at the Detroit Institute of Art. The following speakers will discuss "Newer Applications of Practical Surgical Physiology" as applied to the listed topics:

Dr. Isidore S. Raydin, Philadelphia, Gallbladder and Biliary Tract, November 1.
Dr. Charles F. Geschickter, Baltimore, The Breast, November 8.
Dr. Edward William Alton Ochsner, New Orleans, Preoperative and Postoperative Care, November 15.

New Virus Research Center.—The National Foundation for Infantile Paralysis has awarded an annual grant of \$12,900 to the laboratories of the state department of health to establish in Lansing a virus research laboratory. A special grant of \$5,000 has been given by the U. S. Public Health Service to aid in providing necessary laboratory facilities where this research work may be carried on. Dr. Sidney D. Kramer, formerly of Brooklyn, executive secretary, general advisory committee, National Foundation for Infantile Paralysis, has been appointed director of the state department's new division of virology, which will supervise the new laboratory. Dr. Henry E. Cope, Detroit, has been appointed to the staff of the bureau of laboratories to take charge of the division of clinical pathology. He will be associated with Dr. Kramer it is reported.

MISSOURI

Jackson County Health Forum.—Announcement is made of the 1939–1940 season of the Jackson County Health Forum, sponsored by the auxiliaries of the accredited hospitals of Jackson County. The preliminary notice lists the following speakers:

Dr. Louis J. Karnosh, Cleveland, September 20, Medicine and Crime.
Dr. Rock Sleyster, Wauwatosa, Wis., President of the American Medical Association, October 18, What Price Depression?
Dr. Philip Lewin, Chicago, November 15, Your Feet Deserve Good Care.
Dr. Thurman B. Rice, Indianapolis, December 20, Mental and Emotional Hygiene.
Franklin C. Bing, Ph.D., Secretary, Council on Foods, American Medical Association, January 17, Vitamin Follies.
Dr. Henry F. Helmholtz, Rochester, Minn., February 21, How to Avoid and Care for the Diseases of Infancy and Childhood.
Dr. Elliott P. Joslin, Boston, March 20, Diabetes.
Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, April 17, Frontiers of Medicine.

NEBRASKA

Annual Clinical Assembly in Omaha.—The seventh annual assembly of the Omaha Mid-West Clinical Society will be held October 23–27 with headquarters at the Hotel Paxton. There will be general assemblies each morning; clinics will be held each afternoon and scientific sessions each evening. The guest speakers will be:

Dr. Clarence Rutherford O'Crowley, Newark, N. J., Anomalies of Kidney and Ureter; Polycystic Kidney Disease.
Dr. Charles Anderson Aldrich, Winnetka, Ill., Treatment of Nephritis in Childhood; Role of Gratification in Early Development.
Dr. Clifford J. Barborka, Chicago, Subclinical States of Nutritional Deficiency; Medical Management of Gallbladder Disease.
Dr. Walter Schiller, Chicago, Diagnosis of Malignancies of the Female Generative Tract; Sexual Abnormalities in Females.
Dr. William Wayne Babcock, Philadelphia, Intestinal Malignancy; Clinical Methods as a Guide to the Diagnosis and Treatment of Various Surgical Affections.
Dr. Frank E. Burch, St. Paul, Ocular Evidences of Intracranial Disease; Recent Advances in Ophthalmic Therapeutics.
Dr. Louis J. Karnosh, Cleveland, Diagnosis and Treatment of Polyneuritis; Recognition and Management of Early Psychiatric Problems in General Practice.
Dr. Grandison D. Royston, St. Louis, Recognition and Treatment of Pelvic Malignancy; Indications and Contraindications for Operative Delivery.
Dr. James S. Speed, Memphis, Tenn., Rational Treatment of Acute and Chronic Osteomyelitis; Open Reduction and Internal Fixation of Selected Fracture Cases.
Dr. William L. Estes Jr., Bethlehem, Pa., Acute Nonpenetrating Trauma of the Abdomen.
Dr. Elliott C. Cutler, Boston, Incomplete Intestinal Obstruction; Acute Appendicitis.
Dr. Samuel A. Levine, Boston, Rheumatic Heart Disease; Bedside Diagnosis of Cardiac Arrhythmias.
Dr. William R. Houston, Austin, Texas, Learned Reactions.
Friday morning October 27 there will be a symposium on preoperative and postoperative treatment presented by Drs. Ralph H. Major, Kansas City, Mo.; John S. Lundy and Lloyd H. Mousel, Rochester, Minn.; Walter G. Maddock, Ann Arbor, Mich.; John R. Paine, Minneapolis, and Dr. Estes.

NEW JERSEY

Society News.—Dr. Emil Novak, Baltimore, addressed the Hudson County Medical Society, Jersey City, October 3, on "Endocrine Aspects of Gynecology."—A symposium on "Newer Aspects of Preoperative and Postoperative Care" was presented before the Bergen County Medical Society, Hackensack, October 10, by Drs. Harry A. D. O'Connor, who discussed thyroid cases; John A. Lawler, abdominal cases; John H. Mulholland, intestinal obstruction, and Samuel Standard, fluid balance. All are members of the faculty of New York University College of Medicine.—Dr. Jesse Lynn Mahaffey, state health officer, Trenton, addressed the Atlantic County Medical Society October 13 in Atlantic City on diagnosis and treatment of syphilis.

NEW YORK

New Division of Cancer Control.—A new division of cancer control has been created in the state department of health with Dr. Louis C. Kress, Buffalo, as director. Organization of a statewide program of cancer control, authorized by legislation this year, will begin immediately under the direction of Dr. Kress. The law creating the new division includes an appropriation of \$35,000 for the conduct of three major activities: statistical, clinical and educational. The headquarters of the division are to be in Albany in the New York State Teachers' Association building. The law makes cancer a reportable disease upstate and provides for study of cancer distribution and study of the disease according to age, type and other characteristics. Tumor clinics are to be established in recognized general hospitals and consultants will be provided to aid in the establishment of clinics and their proper functioning. In addition a special effort will be made to study all possible relations between occupations and cancer. Dr. Kress since 1932 has been assistant director of the old division of cancer control in the state department.

District Meetings.—The Seventh District Branch of the Medical Society of the State of New York held its annual meeting at Canandaigua September 28. Four sound motion pictures portraying the work of Dr. Ephraim MacDowell, the story of Jenner and vaccination, discovery of insulin by Banting and Best, and the work of Semmelweis on sanitation in childbirth were shown. Addresses were made by Drs. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, on "The Quality of Medicine"; Edward S. Godfrey Jr., state health commissioner, Albany, "Our Health," and Terry M. Townsend, New York, president of the state society, "Political Medicine." Demonstrations were presented as follows: surgical emergencies, Dr. John J. Moorhead, New York; care of premature infants, Dr. Burtis B. Breese Jr., Rochester; peripheral vascular diseases, Dr. Herman E. Pearce Jr., Rochester; physical therapy, Dr. Louis V. J. Lopez, Canandaigua, and occupational therapy, Dr. Raymond F. Wafer, Canandaigua.—The annual meeting of the Eighth District Branch of the Medical Society of the State of New York was held in Batavia October 5. Speakers on the program were:

Dr. Grover C. Penberthy, Detroit, Trauma and Low Back Pain.
Dr. George F. Cahill New York, Hematuria: Its Clinical Significance.
Dr. Albert D. Kaiser, Rochester, The Problem of Rheumatic Infection in Childhood.
Dr. Merrill C. Sosman, Boston, Roentgenology as an Aid in the Diagnosis of Heart Disease.

There was a discussion on "The Diagnosis and Therapy of the Frequent Gastro-Intestinal Lesions Met With in General Practice," with Dr. Abraham H. Aaron, Buffalo, as chairman. A discussion of the Western New York Indemnity Plan was opened by Dr. George R. Critchlow, Buffalo.

New York City

William H. Welch Lectures.—Dr. Herbert M. Evans, of the Institute of Experimental Biology, University of California, Berkeley, will deliver the second of the William H. Welch Lectures at the Mount Sinai Hospital October 24 on "Unsolved Problems in Anterior Pituitary Physiology." The first of this group was given October 20 on "New Light on the Biological Role of the Antisterility Vitamin E."

Personal.—Dr. Oswald L. Lowsley was made an Officier de l'Ordre National de l'Honneur et Merite by the president of Haiti September 12 in recognition of his services in instructing the Haitian medical profession in urologic surgery. He was also made an honorary professor in the medical school.—It is reported that the "Manual of Diseases of the Eye" by Dr. Charles H. May is being translated into Urdu by the Osmania University, Hyderabad, India, the tenth translation of the book into a foreign language. The sixteenth American edition has just been published.

Conference on Convalescent Care.—The committee on public health relations of the New York Academy of Medicine in cooperation with the Josiah Macy Jr. Foundation will hold a two day conference on convalescent care at the Academy November 9-10. The purpose of the conference is "to redefine the problem of convalescence in the light of recent progress in medical science and to explore the need for further research into the socio-economic and medical aspects of convalescent care." Admission to the conference sessions will be by invitation. A meeting will be held Friday evening November 10, at which the discussions will be summarized. Persons interested are invited to the evening meeting.

Regional Meeting of Railway Surgeons.—The New York and New England Association of Railway Surgeons will hold its forty-ninth annual meeting November 2-3 at the Hotel Commodore. The first day will be given over to clinics at the New York Post-Graduate Hospital under the direction of Dr. Thomas H. Russell. Speakers for the second day include:

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C. Railway Surgeons and the Public Health.
Dr. Fred W. Geib, Rochester, N. Y., Acute Craniocerebral Trauma.
Dr. William E. Misher, Cleveland, Trauma in Transportation.
Dr. Tom Outland, Sayre, Pa., Treatment of Fractures of the Spine.
Dr. Albert B. Ferguson, New York, X-Ray Differentiation of Traumatic and Nontraumatic Lesions.

OKLAHOMA

New Health Officers.—Dr. John A. Morrow, Sallisaw, has been appointed deputy health commissioner of the Oklahoma State Health Department.—Dr. Joe Dorough, Haileyville, has been appointed health superintendent of Pittsburg County and Dr. Weldon K. Haynie, Durant, of Bryan County.

Annual Clinical Conference.—The Oklahoma City Clinical Society will present its ninth annual fall clinical conference October 30 to November 2. The lecturers will be:

Dr. Albert H. Aldridge, New York, obstetrics.
Dr. Edgar G. Ballenger, Atlanta, urology.
Dr. Lewellys F. Barker, Baltimore, internal medicine.
Dr. Lowell S. Goin, Los Angeles, roentgenology.
Dr. Harry S. Gradle, Chicago, ophthalmology.
Dr. John A. Kolmer, Philadelphia, pathology.
Dr. Frank H. Lahey, Boston, surgery.
Dr. Joe V. Meigs, Boston, gynecology.
Dr. Albert Graeme Mitchell, Cincinnati, pediatrics.
Dr. Emil Novak, Baltimore, endocrinology-gynecology.
Dr. Hobart A. Reimann, Philadelphia, internal medicine.
Dr. Erwin R. Schmidt, Madison, Wis., surgery.
Dr. Herman C. Schumm, Milwaukee, orthopedic surgery.
Dr. Rock Sleyster, Wauwatosa, Wis., President, American Medical Association, psychiatry.
Dr. Marion B. Sulzberger, New York, dermatology.
Dr. William A. Wagner, New Orleans, otolaryngology.

PENNSYLVANIA

New Medical Directors.—Dr. Harry L. Baker, Catasauqua, has been appointed medical director for Lehigh County, succeeding Dr. Eugene H. Dickenshied, Allentown.—Dr. Alfred L. Hoffmaster, New Castle, has succeeded Dr. Paris A. Shoaff, New Castle, as medical director of Lawrence County.—Dr. James B. Heller, Pottsville, has been appointed medical director of Schuylkill County.

Psychiatry Society Organized.—The Pennsylvania Psychiatric Society was organized at a meeting in Pittsburgh October 5. Dr. William C. Sandy, director of the state bureau of mental health, Harrisburg, was elected president and Dr. Henry I. Klopp, Allentown, president-elect. Dr. Leroy M. A. Maeder, Chancellor Hall, 206 South Thirteenth Street, Philadelphia, is secretary. In a statement at the organization meeting Dr. Sandy observed that the new society should exercise a statewide general leadership in psychiatry, being a coordinating body to which controversial and other questions of psychiatric interest may be referred for an authoritative opinion, should encourage general medical interest by participation in society meetings and should assist in developing and supporting proper psychiatric standards.

Philadelphia

Surgical Positions Filled at Jefferson.—Dr. Thomas A. Shallow, professor of surgery at Jefferson Medical College, has been appointed to the Samuel D. Gross chair of surgery at Jefferson, a position vacant since the death in 1933 of Dr. John Chalmers DaCosta. Newspapers also announce the appointment of Dr. George P. Müller, also professor of surgery, to the Grace Revere Osler chair of surgery. The Gross professorship was established in 1910 by Mrs. Maria Gross Horwitz, Baltimore, in honor of her father, professor of sur-

gery at Jefferson from 1856 to 1882. Dr. DaCosta held the chair from 1910 to his death in 1933. Dr. Shallow graduated at Jefferson in 1911 and Dr. Müller at the University of Pennsylvania School of Medicine in 1899.

Society News.—Dr. Alfred Blalock, Nashville, Tenn., gave the forty-fifth Mary Scott Newbold lecture of the College of Physicians of Philadelphia October 4 on "Shock."—Drs. Albert E. Bothe and Benjamin Lipshutz addressed the Philadelphia Academy of Surgery October 9 on "Renal Hypertension" and "Regional Enteritis" respectively.—Drs. Albert B. Ferguson, New York, and George E. Pfahler addressed the Philadelphia Roentgen Ray Society October 5 on "Characteristics of Bone Tumors" and "Treatment of Bone Tumors" respectively.—Speakers before the Obstetrical Society of Philadelphia October 5 were Drs. Walter Meredith Heyl on "Experiences with the Placental Blood Bank" and Edward F. McLaughlin, "Intermenstrual Bleeding, A Surgical Condition."

Pittsburgh

Hospital News.—Mercy Hospital celebrated its annual "Mercy Day" September 28. Dr. John H. Musser, New Orleans, spoke on coronary occlusion.

Society News.—The Pittsburgh Otolological Society held a joint meeting with the Cleveland Otolaryngological Club September 27, with Dr. Charles T. Porter, Boston, as the guest speaker on "Orbital Cellulitis."

UTAH

Special Assessment for Insurance Unit.—At a meeting of the house of delegates of the Utah State Medical Association September 4 the articles of incorporation of the Utah Physicians Service Company were approved and an assessment of \$15 was levied on each member of the society to provide for preliminary expenses. The work was carried out by the Medical Service Bureau and the medical economics committee of the society under authority given by the house of delegates at a special session Dec. 10, 1938. According to the *Rocky Mountain Medical Journal*, the action was taken to enable the profession to meet the demands for hospitalization on a pre-paid basis and if possible at least partial medical reimbursement.

WISCONSIN

State Medical Election.—Dr. Ralph P. Sproule, Milwaukee, was chosen president-elect of the State Medical Society of Wisconsin at the annual meeting in Milwaukee September 13-15 and Dr. Ray G. Arveson, Frederic, was installed as president. The next annual meeting will be held in Milwaukee September 18-19, 1940.

GENERAL

White House Conference on Child Health.—A recommendation that President Roosevelt be asked to call the White House Conference on Children into session January 18-20 was adopted at a special meeting of the planning committee of the conference in Washington October 6. The final session was originally scheduled for next spring.

Examination in Surgery.—The American Board of Surgery will hold an examination in Part II November 15 in Atlanta, Ga. The candidates will include only those living in the South. Additional information may be obtained from Dr. John Stewart Rodman, 225 South Fifteenth Street, Philadelphia.

Session on Medical Hydrology Postponed.—On account of the war in Europe the International Society of Medical Hydrology has postponed indefinitely its annual meeting which was scheduled to be held in Italy during October. Since the membership of the society is distributed largely through the countries now at war, it has been necessary to reduce the activities of the International Society of Medical Hydrology to the minimum. In keeping with this policy, the *Archives of Medical Hydrology* for October will not be issued at present. Correspondence addressed to the society at its regular address will receive attention, 22 Bedford, London, W.C.1.

Positions for Graduate Training in Obstetrics and Gynecology.—The American Board of Obstetrics and Gynecology receives from time to time information regarding available internships and assistant residencies. A number of such positions are available each year to men who wish to place their names on file with the board. In all instances a preliminary internship, preferably of the general, rotating type is necessary, and special internships or assistant residencies should be sought at least one year in advance. It is suggested that hospitals having positions open and men seeking such positions

for training communicate with the secretary. Applicants should submit names, addresses and brief biographic data. Address the American Board of Obstetrics and Gynecology, 1015 Highland Building, Pittsburgh (6).

Warnings Against Swindlers.—Harvard Medical School, Boston, has received reports that a magazine salesman has been soliciting subscriptions alleging that he is a student at Harvard and is attempting to earn money for further medical study. The medical school reports that this man, who calls himself Chester Wainwright, is not known and has never been a student there.—Reports have recently come from Missouri of a man who has swindled ophthalmologists in various towns by ordering glasses and making a check for a larger amount than the price. The physician makes change and the man never returns. The swindler has used the name W. C. Curran and appears to be a farmer. The check is usually for \$30. The man is about 5 feet 10 inches tall, weighs about 155 pounds, has light sandy hair and blue eyes and is smooth shaven with a ruddy complexion.

Meeting of Association of Medical Colleges.—The fiftieth annual meeting of the Association of American Medical Colleges will be held at the Netherland Plaza Hotel, Cincinnati, October 23-25, under the presidency of Dr. Willard C. Rappley, New York. The speakers will include:

Dr. Walter Bauer, Boston, The Tutorial System in the Harvard Medical School.

William H. Welker, Ph.D., Chicago, Graduate Medical Education.

Dr. Marion A. Blankenhorn, Cincinnati, Graduate Training in Internal Medicine in a Municipal Hospital.

Dr. Albert Graeme Mitchell, Cincinnati, Graduate Training in Pediatrics at the University of Cincinnati.

Dr. Mont R. Reid, Cincinnati, Training of Surgeons: Method in Use at the Cincinnati General Hospital.

Orren W. Hyman, Ph.D., Memphis, Tenn., Further Attempts to Refine the Methods of Selecting Medical Students.

Dr. Robin C. Buerki, Chicago, Internships and Residencies.

A symposium on student health service will be presented by Drs. John Sundwall, Ann Arbor, Mich., Nathan T. Milliken, Hanover, N. H., Edward S. Ryerson, Toronto, and Harold S. Diehl, Minneapolis.

Fund to Aid Infantile Paralysis Victims.—A gift of \$50,000 to aid handicapped children who are sufferers from infantile paralysis in twenty-five cities of the country has been announced by the Will Rogers Memorial Commission, according to the *New York Times* October 6. The funds were collected last spring from theater-goers in an appeal made in the principal theaters of the country. The gift is being made available through the local chapters of the National Foundation for Infantile Paralysis for emergency needs and for recovery treatment for handicapped children in the chapter areas. Of the shares distributed October 6 New York received the largest, amounting to \$14,595. Other cities in which disbursement took place are Los Angeles, San Francisco, Hartford, Springfield, Boston, Kansas City, Hoboken, Cleveland, Oklahoma City, Tulsa, Houston, Dallas, Milwaukee and Portland. Cities to receive their allotments later are Chicago, Newark, New Orleans, St. Louis, Cincinnati, Detroit, Philadelphia, Pittsburgh, Seattle and Washington. The commission also supports the Will Rogers Memorial Hospital, Saranac Lake, N. Y., and an emergency ward in the French Hospital, New York, for the use of theatrical people.

Society for Prevention of Blindness.—The National Society for the Prevention of Blindness will hold its annual meeting at the Hotel Astor, New York, October 26-28, under the presidency of William Fellowes Morgan. Among the speakers will be:

Dr. Joseph Minton, London, England, What Treatment of 7,000 Industrial Eye Injuries Has Taught Us.

Verne A. Zimmer, U. S. Department of Labor, Washington, D. C., The Interest of the Federal Government in Conserving the Sight of Industrial Workers.

Dr. Leonard Greenburg, New York, Poisonous Substances Affecting the Eyesight of Industrial Workers and How to Guard Against This Growing Hazard.

Dr. Willis S. Knighton, New York, Development of the Eye.

Dr. Otis J. Doupinett, Portland, Me., Early Supervision of Eye Muscle Control.

Dr. Philip M. Stimson, New York, What the Pediatrician Does to Save Sight.

Dr. James V. Cassady, South Bend, Ind., Prevention of Blindness Programs Developed by State Medical Societies.

Dr. Vonnie M. Hicks, Raleigh, N. C., What State Supervising Ophthalmologists Are Doing in the Prevention of Blindness.

Dr. Carl E. Rice, Washington, D. C., Possibility for Prevention of Blindness.

Dr. Harry S. Gradle, Chicago, Incidence and Distribution of Trachoma in the United States.

Dr. James G. Townsend, Washington, D. C., Treatment of Trachoma.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 27, 1939.

Medical Arrangements in Time of War

In a letter to the *Times*, Lord Dawson, late president of the Royal College of Physicians, discusses the problem of making the best use of the medical profession during a war which presents novel features. The task of registering physicians for varied duties has been performed by the British Medical Association during the past twelve months with conspicuous success. The Ministry of Health took the hospitals under its direction and mobilized physicians to staff them. It had the difficult task of urgent preparation for massed air attacks, involving rapid evacuation of casualties from the center to the periphery, side by side with care for the hospital needs of the civil population. For a time the latter faded and the big voluntary hospitals were denuded. But now organization is taking the place of improvisation. The Ministry of Health has taken steps to enable consulting physicians and surgeons to transfer from whole time to part time services in order that hospital and private patients may be served. It has to be remembered that, after the children, with those in charge of them, and the aged and infirm had been evacuated, the great majority of the citizens had to live and work and therefore required their hospitals. Services have been resumed with a proportion of the staffs.

Lord Dawson suggests the following modifications: 1. A portion of each hospital must always be available as a casualty clearing station. 2. The average stay in the hospital should be shorter. 3. Serious cases should also be provided for in the proximal outside hospital of the sector. (The dividing of London into sectors with the great hospitals at the center and affiliated hospitals in the country, into which the patients were evacuated for safety from air raids, has been described in a previous letter.) On the other hand, patients requiring special treatment, such as high-voltage roentgen therapy, must be gathered wherever such treatment is located. It has been agreed in principle that there is to be a united hospital service for the whole country. The army will provide directly for its sick and wounded in the theater of war, but in England they could be treated in the same hospitals as civilians, except slight and convalescent cases, which can be aggregated in convalescent hospitals subject to military discipline. This system would result in better service and save cost.

The supply of physicians is limited and has called for careful allotment. In particular the skill of specialists should not be wasted by needless duplication. Head and chest injuries are examples. Centers for both are being organized where not only they can be treated to the best advantage but where men of selected ability are being constantly trained to fill posts at home or over sea. If arrangements are left to military or civilian authorities, confusion will result, especially if a key man is put to wrong use. A small "intelligence" committee consisting of representatives of the army and its civilian medical services could act as a clearing house. Success in war depends more and more on knowledge and its application not only to medicine but to every other aspect of the struggle.

The Fate of Swallowed Foreign Bodies

Although many cases of swallowed foreign bodies have been reported, little has been written on the question whether they should be removed. At the Section of Surgery of the Royal Society of Medicine Mr. A. M. H. Siddons endeavored to answer this question by means of the records of three London hospitals—St. George's, the Royal Waterloo and the Belgrave, which have a high proportion of children's beds. It is children

and the insane who most frequently swallow foreign bodies. He collected records of 126 patients admitted to these hospitals. It should be borne in mind that these patients were selected by surgeons as sufficiently dangerous to require treatment as inpatients. It is not possible, therefore, to draw conclusions from them as to the percentage of all swallowed foreign bodies which require removal. Indeed, this cannot be ascertained, as many cases never reach the physician. In 107 of the 126 cases (85 per cent) the foreign bodies were passed naturally, and in only four did perforation or obstruction occur. The remaining thirteen foreign bodies were removed, as the surgeon considered it dangerous to leave them or because it did not appear to him that they would be passed naturally. These figures may be compared with American ones reported by Henderson and Gaston in the *Archives of Surgery* in January 1938. They found nine instances of perforation in about 800 cases, most of which were not admitted to the hospital. They emphasize that many of the patients never seek medical aid and that therefore this figure of about 1 per cent for perforation is too high. Siddons divided his cases into three groups: blunt objects (sixty), long objects (eighteen), sharp objects excluding open safety pins (forty) and open safety pins (eight). It is interesting how long blunt objects stop in one place in the alimentary canal, only to progress again for no apparent reason. It might be expected that objects which failed to pass the pylorus for a whole day would never do so, but in some cases they were watched in the stomach for weeks and then went on their way. The average time for the object to pass in the entire series was six days and in each group about the same. What is more important, they did not seem to do any harm while stationary. There are many records of insane persons and professional swallows who have retained objects in their stomachs for long periods without ill effects. In only one case of the series was a body arrested at the ileocecal region, causing intestinal obstruction. In the sixty cases of blunt objects there were eight operations for removal. Excepting the case mentioned there were no symptoms of harm. The operations were performed because the surgeons thought that the object would not pass, and had they been left probably most of them would have been passed naturally. Siddons thinks that there are very few objects able to pass down the esophagus which will not pass through, provided they are not sharp or unduly long. After the pylorus, the ileocecal region seems to be the only other likely site of arrest.

Long blunt objects include screws, nails and Kirby grips. They usually pass the pylorus but find the curves of the duodenum difficult. After this they usually find no obstruction. In the eighteen cases only one operation was performed: removal of a nail from the cecum on the second day. Siddons believes that it would have been passed naturally if it had been left. All the other objects were passed.

Sharp foreign bodies include needles, pins and open safety pins. Excluding the last there were forty cases, of which the object was passed naturally in thirty-seven. Not one perforated. In three cases the object was removed from the stomach because the surgeon did not think it safe to leave. The open safety pin presents a special problem. In four of the eight cases it was removed by operation, with one death. Of the other four, one perforated the stomach and was removed safely; the other three were passed naturally. Eight cases are not enough to form a basis for evaluating the risks, but there is no doubt that they are greater than with any other object. Siddons thinks, however, that they should be given a chance to pass, like other objects. Nearly all blunt objects pass naturally and should be given from four to six weeks. He does not agree with the recommendation to give bulky foods, as they may hasten obstruction and even in the case of sharp objects do not serve any useful purpose. He advises an ordinary diet and no purgatives.

Alterations in Medical Journals

As in the case of the lay press, medical journals have been obliged by the war to reduce the number of pages. The *British Medical Journal* has ceased to print its Key to Medical Literature. To economize, the Supplement will no longer appear as a separate inset. In it will be published information from the Central Emergency Committee of the British Medical Association, which was created to supply the medical needs of the fighting forces and civilians injured in air raids. It is probable that increasing economy of space will be necessary, so contributors are asked to be sparing of their words.

PARIS

(From Our Regular Correspondent)

Sept. 13, 1939.

French Medical Mobilization

Long before the war, France had prepared its medical mobilization. Without describing the medical organization in the army, I should like to show how the major health problems have been attacked and what has become, in the present war, of medicine and the medical profession.

A large number of France's 28,000 physicians have been drafted for the army. In fact, a law passed last year permits the government to commandeer the services of every Frenchman 18 years and over, including female physicians. The character of modern warfare is different from that of previous centuries. Until the French Revolution, war was a vocation and mercenary soldiers fought on limited territories. Their wounds were treated by "surgeons," one of whom was Ambroise Paré, the father of French surgery. Many others have left their mark in the history of medicine. Today the entire nation, except women and children, is engaged in war.

Few physicians have been exempt from military duty: 72 per cent serve in the national defense; 67 per cent of these wear uniforms; 5 per cent are civilians who function partly under army orders or those of the civil government. Accordingly, there remain about 6,000, many of whom are elderly or infirm. In consequence, many small towns and country regions have no medical service. Formerly, armies carried with them not only their "surgeons" but also their ambulances and to a certain degree their hospitals. Nowadays, except for establishments at the front which are, above all, centers of first aid and subject to quick changes, military health service coincides with civil health service. It includes large medical centers the equipment of which has been planned in times of peace and which utilize the hospital resources of peace times. Besides the wounded, the sick such as tuberculous persons have to be taken care of. From the medical point of view, both the tuberculous soldier and the tuberculous civilian are the same. Shifts of specialists have therefore been provided who look after civilian and military tuberculous patients in the existing sanatoriums, look after their recovery and follow them up after they leave the army.

What becomes, under these circumstances, of medical instruction? Students continue to enroll to the extent to which mobilization permits young men to undertake university studies, but the means of instruction have been greatly reduced. In large cities hospital training has reached a stage of anemia, partly because of the reduced population evacuated in large numbers and because of the abandonment of many class rooms as too exposed to the dangers of bombardment. The Faculty of Medicine of Paris had to move to Nantes to remain until further orders. Fifty-two per cent of its professional staff, 75 per cent of the agrégés, or assistants, and 90 per cent of the heads of laboratories or prosectors have enlisted. The students called to the colors there receive credits corresponding to their medical standing. Not only are arrangements made for examinations and thesis preparation but, in certain towns farther back from the front, courses of study lasting

several weeks are organized which permit the students to get ready for examinations before examiners who, likely enough, will consider emergency conditions. Precautions have been taken for laboratories. Fragile instruments, museum collections, ornamental objects and rare books have been stored in protected cellars. The Faculty of Medicine of Paris continues, but its activities have been largely curtailed. War destroys not solely human lives and human works. It undoes spiritual and moral values often more difficult of replacement than a railroad bridge or a model factory.

Defensive Measures Against Air Bombardments

In spite of all the measures provided to prevent hostile aircraft from releasing bombs over civil populations, some, estimated at 30 per cent, may reach their mark. Many, but not all, of these bombs will fall outside houses. A committee of passive defense, therefore, has been set up by law presided over by Marshal Pétain. Professor Tanon, of the department of health of the Faculty of Medicine, has been placed in charge in Paris, where every one has been removed from the city whose presence can be dispensed with, reducing the population from three million to somewhat more than one million. These will be protected, in case of bombardment, in subterranean shelters capable of supporting the shock at least of a bomb of 50 Kg. or a crumbling of 2,000 Kg. per square meter of surface. Against gas, masks have been distributed sufficient to protect against all known gases but offering no aid against carbon monoxide or hydrocyanic acid and perhaps equally insufficient against new gases which modern war chemistry may evolve. Most of the shelters are gas tight. However, medical aid stations have been prepared against possible gas infiltrations, "cave ins" and resulting panics. These medical aid stations cover extensive subterranean spaces, generally store-rooms or former quarries specially made over for their new use. They are supplied with small outside stations designed for those who have been infected with caustic gas. Aid stations are gas tight. Since gas might penetrate during the reception of patients, ventilation has been provided for from the outside air taken at a great altitude and above the gas level. This ventilation causes a higher pressure that protects the station against vitiated air. The output of the apparatus, each of which furnishes 600 cubic meters of air per hour, is calculated to carry 2 cubic meters of air hourly per cubic meter of the volume of space. The higher pressure, under these conditions, reaches between 2 and 6 mm. of mercury. The ventilators are set in motion by electricity, but, in case of a break in the current, apparatus with pedals resembling those of bicycles can assure functioning of the pumps. The air taken from the outside is analyzed every quarter of the hour by means of simple and rapidly functioning apparatus. If it is found vitiated—a thing of scant probability because of the height at which the air is taken—every one puts on his mask.

The patients, brought in by special outside crews, are assigned to one of three fundamental divisions: the wounded, the asphyxiated and the gassed. The wounded receive the necessary surgical attention in a simple operating room. Those asphyxiated are treated by the classic methods, inhalation of oxygen or carboxyl, camphorated oil or artificial respiration. Those overcome by mustard gas are copiously bathed and washed with chlorinated lime (10 per cent), undressed and doused with soap. The aids who have charge of them wear garments that protect them completely against yperite. After receiving first aid, the patients are assigned to special wards in Paris hospitals. Several kilometers from Paris a hospital with 5,000 beds receives the gassed whose treatment is likely to be prolonged. It is a model hospital from the point of view of perfect equipment for these treatments. Medical services thus organized are repeated on a smaller scale in all French cities. They seem to be adapted to all emergencies.

Primal Sutures of Wounds

Vassitch of Belgrade presented before the Academy of Surgeons an analysis of more than 19,000 traumas observed during 1929-1935, of which about 20 per cent were treated by primal suture. This operation does not entail grave accidents; however, it is necessary to take account of the object that caused the wound and whether the wound is clean or not. Vassitch adopts the classification proposed by Braine for flesh wounds. In wounds associated with fractures or complicated by osseous, articular or vascular lesions, bacterial virulence must be reckoned with. The essential prerequisite of the treatment of the wound is always its cleansing and the excision of contused tissue.

BERLIN

(From Our Regular Correspondent)

Aug. 30, 1939.

Congress of Surgeons

The opening address of this year's meeting of the Deutsche Gesellschaft für Chirurgie was by the chairman, Professor Nordmann, who is director of a hospital in Berlin. He cautioned against the exaggerated tendency toward new divisions of medicine. The efforts of neurologic surgeons to organize a distinct group was thwarted only by ministerial interference and by uniting them into a subdivision of the society.

The first paper was read by K. H. Bauer, of Breslau, on fractures of the base of the skull. Animals scarcely ever are subject to them and almost never through a fall. Such fractures are a "tribute to the progress of mechanics and traffic." Of those injured, 59 per cent were hurt in traffic accidents; 31 per cent of these died before medical attention could be given them; 66½ per cent of all skull fractures affect the base. The mortality in 4,200 observed cases was 39.2 per cent. The important diagnostic factor was the evidence of fracture revealed by the x-rays, and this was not so simple a matter. Three roentgenograms are required, especially the axial photograph with drooping head. Pressure on the brain can be relieved by intravenous injection of hypertonic salt and sugar solutions. Lumbar punctures in nearly all cases afford subjective and objective relief. Dandy and others, however, reject lumbar puncture in fractures of the base, on the ground that the brain may suffer further injury through change of position and because of the danger of secondary hemorrhages. As a last recourse trepanation is employed. Cushing ascribes to its early use the reduction of from 50 to 15.5 per cent in the mortality rate of fractures of the base of the skull. In about 10 per cent of the cases trepanation is indicated; extradural bleeding is a strong indication. In cases of subdural hematoma the mortality in surgical intervention is considerably higher. Of 512 subdural hematomas, fifty-two could not be diagnosed. According to recent statistics (2.5 per cent in 430 cases) danger of meningitis is low. Prognosis of employability after fractures of the base of the skull is discouraging. Frequently, according to the speaker, paralyzes of the nerves and injuries of the organs of sense can be proved; psychic disturbances are rare. Scar tissue formations of the brain may appear as a retarded injury and may induce epileptic hemiplegias. In the discussion of the paper Tönnis, a Berlin surgical neurologist, pointed out the results achieved in treating late epilepsy due to accidents. Success depends on selecting cases suitable for surgery. Only such epileptic patients should be operated on who have a dural bone callus; eleven of the twelve patients operated on did not suffer subsequent attacks. Of thirteen patients with skull fracture, eleven were permanently cured of attacks by surgery. In his paper on osteomyelitis Laewen, of Königsberg, pointed out that of late there has been a marked tendency to conservative therapy. Blood transfusion, suitable nutrition and rest are the most important conservative curative measures. Maggot therapy is also used.

Wilbolz, of Berne, read a paper on urogenital tuberculosis. He called attention to the fact that this was an open tuberculosis and dangerous for those in attendance on the patient. Hematogenic infection was here as significant as canalicular. Tubercle bacilli confined to the urogenital tract always seek to return. The seat of urogenital tuberculosis must be sought in the kidneys. The speaker favored early recourse to nephrectomy, which yielded permanent recovery in 80 per cent of the cases. Delayed surgery reduced this favorable proportion to 50 per cent. Consequently, early diagnosis of urogenital tuberculosis was of the greatest importance. Examination of the urine for tubercle bacilli often furnishes the answer, for tubercle bacilli are never excreted from a nontuberculous kidney. Tuberculous bacilluria is always the forerunner of tuberculosis of the kidney that is characterized by caseous cavities. If pyuria appears, nephrectomy must be performed. In benign cases tuberculosis will assume the "fibrous form," that is, contraction without caseation localized under the renal cortex; fibrous cortices without pyuria may cicatrize. Delay under medical observation was therefore advisable. If pyuria and slight functional disturbances accompany bacilluria, the caseous form of tuberculosis of the kidney is to be assumed and nephrectomy is in order. Bacilluria is almost always unilateral. This justifies the assumption that tuberculosis of the kidney is almost always unilateral.

Fromme, of Dresden, gave an exhaustive account of gastric ulcers, which have become more numerous and their seat nowadays is in the duodenum rather than in the stomach. Resection of ulcers of this type ought not to be insisted on as imperative, because of the danger of severing the choledochus. In 5 per cent of the cases, duodenal fistulas set in with a mortality of 50 per cent. The roentgenogram does not always clearly indicate whether an ulcer is operable. In nonoperable ulcers, resection for the purposes of elimination (according to Finsterer), also gastro-enterostomy, could be recommended. The disadvantages of this operation were that the ulcer remained, inviting the danger of hemorrhages and perforation. Likewise malignant degeneration constituted a possibility, though not a grave one. In the discussion that followed this paper, the greatest emphasis was put as usual on the results achieved by the different methods, but without agreement. Haberer, of Cologne, gave a report of his 3,373 resections of the stomach, of which 435 constituted corrective surgery. In 16 per cent of the cases, 211 extirpations of peptic ulcers of the jejunum resulted fatally. Peptic ulcers of the jejunum cannot be avoided in cases of gastro-enterostomy. He achieved the best results with the second procedure of Billroth, with anastomosis according to Roux.

Professor Lehmann, of Rostock, treated the problem of the relations of surgical clinics and x-ray institutes. Roentgenology is not a separate specialty but a medical ally. The type of men who are merely roentgenologists will disappear. X-ray institutes conducted independently easily lose contact with the clinics and yet the work done in the x-ray laboratory is part and parcel of the work done in the clinics. The directors of x-ray divisions should be members of the clinical staffs. He admitted the great difficulties of an organizational nature. For special examinations such as those of pyelography, ventriculography and myelography, the ward system of hospitals with central x-ray institutes was not practical. Roentgenologists should not by themselves determine indications. Lehmann thinks that the x-ray department of a hospital should be in charge of a roentgenologist who is subject to the director of the surgical division. This position was challenged by the chairman of the society of German roentgenologists, who stated that the greatest importance was attached to close cooperation but that the problems discussed by Lehmann were still too undarified to permit the roentgenologists to make a final decision. The comments of Professor Götze, surgeon in Erlangen,

on the degree to which specialization was being carried on deserve mention. In a general hospital, young physicians no longer had an opportunity to become acquainted with a large number of diseases requiring surgery, because these were taken care of by specialists. However, he continued to say, it was necessary that general surgery and the special fields of medicine supplement one another. Surgical clinics of universities should control all special fields of medical surgery, especially those that deal with accidents, fractures, orthopedics, urology and roentgenology, if for no other reason, at least for the training of students and assistants.

Professor König, of Würzburg, read an exhaustive paper on surgery and cancer control in which he took issue with those who were too pessimistic of the situation. Cancer of the stomach has the highest rate of cancer mortality with about 50 per cent. According to his computations, surgery performed on stomach cancers reduces mortality to 10 per cent. From 50 to 60 per cent of stomach carcinomas and 80 per cent of carcinomas of the rectum admit of surgical therapy. The important thing was to treat the disease in its early stages. The reason why results were reported covering only relatively short periods was principally that statistics do not extend sufficiently over larger periods of time. According to recent statistics based on investigations and inquiries made by seven well known hospitals, 424 of 1,260 former carcinomatous patients were designated as cured and free from ailments after from ten to twenty-five years. In considering these figures, one ought also to take account of the fact that a considerable number of those operated on for carcinoma had in the meantime died of other diseases. The number of those surgically cured of cancer would therefore be greater. The figures furnished by Professor Laewen, of Königsberg, by way of illustration are illuminating. Between 1935 and 1939, 18,864 female patients were examined serially for carcinoma of the breasts. Only 800 had new cancerous growths. In 3,767 gynecologic examinations, only four new carcinomas of the collum, one of the rectum and 106 suspected cases of the portio were discovered. Guleke, of Jena, found only thirteen verified cancerous formations in 200 similar examinations. A motion to organize special tumor clinics in Germany did not meet with the approval of the society. Other papers dealt with arthritis deformans, with treatment to be employed in bone fractures and with orthopedic problems.

Marriages

WILLIAM THOMAS HENDRIX, Spartanburg, S. C., to Miss Mary Emily Parker at Emory University, Ga., July 22.

RICHARD PHILIP CUSTER, Philadelphia, to Mrs. Claire Payzant Lohrke of Dartmouth, N. S., Canada, recently.

ROGER SHERMAN DOWNS, Saratoga Springs, N. Y., to Dr. ELINOR WHITNEY FOSDICK of New York, recently.

JAMES ROBERT FITZGERALD to Miss Myra Marcelle Sullivan, both of Chicago, at Davenport, Iowa, August 7.

WILLIAM C. HUFFMAN, Clarksburg, W. Va., to Miss Henrietta Claxon of Lawrenceburg, Ky., August 29.

WALTER WATSON ANTHONY VINKS to Mrs. Almary Seifert Lee, both of Lincoln, Calif., in Chicago, June 12.

JOHN WINSTON ADAMS JR., Chandler, Okla., to Miss Margaret Emily Harvey of Memphis, Tenn., July 17.

CLARENCE ALEXANDER KINNEY, Florence, S. C., to Miss Rosalie West Parks of Bennettsville, August 26.

BERNARD B. NEUCHILLER, Woodstock, Ill., to Miss Doris Purcell of Equality in Chicago, September 2.

WILLIAM S. MUSE, Lexington, Tenn., to Miss Loretta Greaney, of Worcester, Mass., September 2.

THOMAS A. GONDER JR., Milton, Mass., to Dr. SARAH HIGGINSON BOWDITCH of Oakland, Md., recently.

ROBERT GEORGE HEASTY, Wichita, Kan., to Miss Harriet Taliaferro Allen of Danville, Ky., July 22.

ROBERT BEALL HIGHTOWER, Washington, D. C., to Miss Russell MacDonald of Norton, Va., July 20.

FREDERICK R. DETTLOFF, Cloverdale, Ind., to Miss Kathryn Atkinson of Bloomington, September 30.

DONALD LURTON AREY, Danville, Va., to Miss Beverly Jeanne Barclay at Hempstead, N. Y., August 2.

FRED G. PATTERSON, Chapel Hill, N. C., to Miss Julia Baylor Shirley of Richmond, Va., September 5.

LEWIS EARL FRASER, Edmonton, Ky., to Miss Alice Jean Keith in Carthage, Miss., September 20.

HERMAN W. FARBER, Weldon, N. C., to Miss Henrietta Salsbury of Richmond, Va., August 30.

WILLIAM RAYMOND HAWKINS to Miss Hiawatha Louder, both of South Fork, Pa., September 4.

STEPHEN T. MANONG, Chamberlain, S. D., to Miss Gertrude Miriam Roe of Jackson, Mich., July 9.

JOHN COLE BURWELL JR., Greensboro, N. C., to Miss Jeanette Dorst of Austin, Minn., July 22.

JAMES EDWARDS CAMERON, Alexandria City, Ala., to Miss Edith Ellison at Hartsboro, August 1.

WILLIAM RAY MOORE to Miss Elizabeth Anderson Mason, both of Louisville, Ky., September 8.

NORMAN E. BASINGER to Miss Rosemary Williams, both of Elyria, Ohio, in Cleveland, June 26.

ROBERT MONROE McMILLAN, Candor, N. C., to Miss Dorothy Burchfield of Danville, Pa., July 12.

JOHN D. FITZGERALD, Roxboro, N. C., to Miss Betty Kathryn Offerman of Durham, September 5.

ROBERT F. DEARBORN, Orangeville, Ill., to Miss Barbara Burritt of Rockford, September 2.

EDWIN HALE THORNHILL, Durham, N. C., to Miss Pattie Marie Sills of Nashville, July 21.

RUTH EVANS BRINKER, Keokuk, Iowa, to Mr. Dan R. Hamady of Flint, Mich., July 29.

RANDOLPH PATTON MOORE, Lisbon, Ohio, to Miss Carol Barthelme of Cleveland, July 22.

THEODORE J. BRUEGGE, Kokomo, Ind., to Miss Catherine Lynch in Indianapolis, August 5.

GEORGE STREET McREYNOLDS JR. to Miss Sheddie Usher, both of Philadelphia, August 29.

JAMES HOMER LEIGH to Miss Kathryn Parks, both of Philadelphia, Miss., August 17.

JOSEPH L. HUNSBERGER to Miss Elizabeth Williams, both of Norristown, Pa., August 26.

ROBERT E. STONE, Chapel Hill, N. C., to Miss Frances Blakeney of Monroe, July 31.

WALTER LEE BRANDON to Miss Christina Ann Stewart, both of Poplar Bluff, Mo., July 7.

LUKE DENNIS GARVIN to Miss Helen Jane Chisholm, both of Bradford, Pa., October 7.

RUSSELL L. FINCH, Lansing, Mich., to Miss Althea L. Wysong of Holt, August 12.

WILLIAM LOUIS McLEOD to Miss Margaret Bland, both of Buies Creek, N. C., July 15.

JOHN W. BRADBURY to Miss Octavia Martinell, both of Galveston, Texas, August 5.

FRANK A. INDA, Omaha, to Miss Margaret M. Powers of Little Falls, N. Y., recently.

D. FOREST MOORE, Shelby, N. C., to Miss Eleanor Lyot Morton of Terrell, July 26.

HENRY EDWARD HENGEL, Amherst, Ohio, to Miss Grace Null of St. Louis, July 24.

LEROY W. CHILDS, Atlanta, Ga., to Miss Nancy Williams, Lake Kerr, Fla., August 5.

WILLARD E. FISCHER, Detroit, to Miss Barbara Jeanne Coan of Gladwin, Mich., July 29.

TIMOTHY F. P. LYONS, Boston, to Miss Anna Doherty of Milton, Mass., recently.

JULIUS FOLDES, Nanticoke, Pa., to Miss Mary Murphy of Oak Lane, August 19.

WILLIAM J. DONALD, Brewton, Ala., to Miss Vivian Frazier of Mobile, August 4.

ARTHUR FEITELL to Miss Freda Joyce Prichap, both of New York, September 12.

HAROLD ABRAMSON to Miss Lucy Kahn, both of New York, August 10.

Deaths

Algernon Coolidge ☉ Boston; Harvard Medical School, Boston, 1886; clinical instructor of laryngology, 1893-1906, assistant professor, 1906-1911, professor, 1911-1925, and since 1925 professor emeritus at his alma mater; professor of laryngology emeritus at the graduate school; member of the New England Otolaryngological and Laryngological Society and the American Clinical and Climatological Association; past president of the American Laryngological Association; fellow of the American College of Surgeons; for many years on the staff of the Massachusetts General Hospital; author of "Diseases of the Nose and Throat" published in 1915; aged 79; died, August 16, of heart disease and arteriosclerosis.

Wilbur Ashley McPhaul ☉ Jacksonville, Fla.; University of Nashville (Tenn.) Medical Department, 1904; state health officer; served as health officer of Robeson County, N. C.; in 1919 was director of rural sanitation work with the Alabama State Board of Health, becoming in the same year health officer of Montgomery; in 1920 was appointed health officer of Charlotte, N. C.; in 1931 he resigned to become field director of the U. S. Public Health Service; health officer of Pensacola for many years; at one time member of the state legislature of North Carolina; past president of the Florida Public Health Association; aged 60; died, August 1, in a local hospital.

Lawrence Taylor Price ☉ Richmond, Va.; Medical College of Virginia, Richmond, 1903; emeritus professor of clinical urology at his alma mater; president of the Virginia Urological Society; member of the American Urological Association; urologist to the Johnston Willis Hospital; on the staffs of the Memorial, St. Philip, Dooley and City Home hospitals, Retreat for the Sick Hospital and Tucker Sanatorium; consultant urologist to the Pine Camp Hospital, Brook Hill, Southside Community Hospital, Farmville, and the Westbrook Sanatorium; aged 58; was killed, August 15, when he fell from a fifth story window.

Maurice Joseph Gelpi, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1911; fellow of the American College of Surgeons; past president and secretary of the Orleans Parish Medical Society; instructor and assistant professor of gynecology at his alma mater, 1911-1916; professor of surgery, Loyola Post Graduate Medical School in 1921; editor in chief of the *New Orleans Medical and Surgical Journal* from July 1922 to June 1923; aged 56; served in various capacities on the staffs of the Charity Hospital and the Hotel Dieu, Sisters' Hospital, where he died, August 9, of cardiovascular disease and cerebral hemorrhage.

Frederick Stauffer, Monterey, Calif.; Kentucky School of Medicine, Louisville, 1893; member and past president of the Utah State Medical Association; formerly member and president of the Utah State Board of Health and Salt Lake County Medical Society; member of the American Academy of Ophthalmology and Otolaryngology; member and past president of the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; surgeon to the Dr. W. H. Groves Latter-Day Saints Hospital, Salt Lake City, for many years; aged 72; died, July 20.

Pio H. Laporte, Edmundston, N. B., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1901; minister of health and labor for the New Brunswick government; past president of the New Brunswick Medical Society; New Brunswick representative on the Medical Council of Canada; for many years mayor of the town and chairman of the school board; aged 59; died, July 29, in a hospital at St. Basile, of injuries received in an automobile accident.

Louis Mervin Maus ☉ Colonel, U. S. Army, retired, Rockville, Md.; University of Maryland School of Medicine, Baltimore, 1874; entered the army as assistant surgeon in 1874 and rose through the various positions to that of colonel in the medical corps in 1907; veteran of the Spanish-American and World wars; was awarded the Distinguished Service Medal for service among the Indians; retired May 8, 1915, by operation of law; aged 88; died, August 3, of obstructive jaundice.

Frederick Eugene Trotter ☉ Honolulu, Hawaii; University of Virginia Department of Medicine, Charlottesville, 1895; member of the House of Delegates of the American Medical Association in 1924 and 1930; commissioner of the Hawaii Board of Health and past president; past president of the State and Provincial Health Authorities of North America; veteran

of the Spanish-American War; formerly surgeon in the U. S. Public Health Service; aged 66; died, August 7, of heart disease.

John Andrew Evert ☉ Glendive, Mont.; University of Minnesota Medical School, Minneapolis, 1913; past president of the Medical Association of Montana and past president and secretary of the Eastern Montana Medical Association; fellow of the American College of Surgeons; served during the World War; chief surgeon of the Northern Pacific Hospital; aged 54; died, August 17, of plasma cell myeloma.

James Homer Buckley ☉ Fort Smith, Ark.; Tulane University of Louisiana School of Medicine, New Orleans, 1896; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Sebastian County Medical Society; on the staffs of St. Edward's Mercy and of the Sparks Memorial Hospital; aged 64; died, July 31, of heart disease.

William Lytle Ross ☉ Omaha; Rush Medical College, Chicago, 1883; Bellevue Hospital Medical College, New York, 1887; member of the Radiological Society of North America; professor of dental neurology at the Creighton Dental College, 1905-1922; aged 80; died, August 26, in the Nicholas Senn Hospital of carcinoma of the head of the pancreas.

Graham Wall Diggs, Wetumka, Okla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1905; member of the Oklahoma State Medical Association; formerly secretary of the Hughes County Medical Society; mayor of Wetumka; served during the World War; aged 59; died, August 18, in the Veterans Administration Facility, Muskogee.

Robert Swan Killough ☉ Amarillo, Texas; Eclectic Medical Institute, Cincinnati, 1896; fellow of the American College of Surgeons; past president of the Potter County Medical Society; aged 72; on the staffs of the Northwest Texas Hospital and St. Anthony's Sanitarium, where he died, August 24, of a fractured hip received in a fall.

Thomas Sampson Royster ☉ Henderson, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1916; fellow of the American College of Surgeons; at one time passed assistant surgeon lieutenant in the United States Navy; on the staff of the Maria Parham Hospital; aged 48; died, August 1, of coronary thrombosis.

John Buis ☉ Pender, Neb.; University of Nebraska College of Medicine, Omaha, 1907; past president of the Cedar-Thurston-Wayne-Dixon-Dakota Counties Medical Society; served during the World War; aged 60; died, August 7, in the Immanuel Deaconess Institute, Omaha, of Hodgkin's disease and cerebral hemorrhage.

Robert Lee Kunkle, Piqua, Ohio; Ohio Medical University, Columbus, 1902; member of the Ohio State Medical Association; served during the World War; formerly city physician and health officer; aged 63; on the staff of the Memorial Hospital, where he died, August 2, of cirrhosis of the liver.

Barrie Samuel Rankin ☉ Kingwood, W. Va.; Baltimore Medical College, 1907; past president of the Preston County Medical Society; at one time member of the state legislature; served during the World War; formerly superintendent of the state hospital at Spencer; aged 67; was drowned, August 22.

Frederick William Hagney ☉ Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; aged 71; on the staff of Hospital of St. Barnabas and for Women and Children, where he died, August 26, of chronic myocarditis and arteriosclerosis.

Joseph Hubbard Saunders ☉ Williamston, N. C.; University College of Medicine, Richmond, 1905; past president of the Martin County Medical Society; served during the World War; formerly county health officer; aged 56; died, August 3, in a hospital at Richmond, Va., of hepatitis.

Thomas Leo Caldronney, Ridgefield Park, N. J.; University and Bellevue Hospital Medical College, New York, 1917; member of the Medical Society of New Jersey; on the staff of the Hackensack (N. J.) Hospital; aged 46; died, August 2, in Pompton Lakes of acute coronary thrombosis.

Alden J. Brace, Vici, Okla.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1900; member of the Oklahoma State Medical Association; aged 66; died, August 7, in the Shattuck (Okla.) Hospital following an operation for ruptured appendix.

Emil George Vrtiak ☉ Chicago; Rush Medical College, Chicago, 1920; associate clinical professor of medicine at his alma mater; on the staff of the Lutheran Deaconess Home and Hospital; aged 48; died, August 7, in the Presbyterian Hospital of coronary thrombosis.

John H. Colay, Morrilton, Ark.; University of Arkansas School of Medicine, Little Rock, 1911; member of the Arkansas Medical Society; aged 58; on the staff of St. Anthony's Hospital, where he died, August 16, of injuries received when he fell down an elevator shaft.

John Thomas Denton, Sanford, Fla.; Memphis (Tenn.) Hospital Medical College, 1902; member of the Florida Medical Association; formerly secretary of the Seminole County Medical Society; aged 60; died, August 3, in the Greenville (S. C.) General Hospital.

Robert Newhall Smith, Hollis, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1897; aged 67; died, July 30, of a streptococcal infection resulting from a fall which forced the pipe he was smoking through the back of his throat.

Joseph Ambrose Brady, New York; Long Island College Hospital, Brooklyn, 1903; member of the Medical Society of the State of New York; on the staffs of the Misericordia Hospital and St. Vincent's Hospital; aged 62; died, August 26, of heart disease.

Gaston Day, Jacksonville, Fla.; Johns Hopkins University School of Medicine, Baltimore, 1906; member of the Florida Medical Association and the American Society of Anesthetists; served during the World War; aged 57; died, August 5, of coronary occlusion.

Edward Augustus Stratton @ Danbury, Conn.; University of the City of New York Medical Department, 1883; fellow of the American College of Surgeons; surgeon to the Danbury Hospital; aged 77; died, July 9, of carcinoma of the stomach.

Henry William Held, Vincennes, Ind.; Medical College of Ohio, Cincinnati, 1894; member of the Indiana State Medical Association; formerly county coroner; aged 69; died, August 9, in the Good Samaritan Hospital of diabetic gangrene.

Robert Lee Cater Jr., Greensboro, N. C.; Emory University School of Medicine, Atlanta, Ga., 1916; member of the Medical Society of the State of North Carolina; aged 44; was found dead, August 8, of acute dilatation of the heart.

John Frederick Cumming, Morris, Minn.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1922; member of the Minnesota State Medical Association; aged 41; died, July 12, of hypertension and cerebral hemorrhage.

James Allen Ballard, San Francisco; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1904; served during the World War; on the staff of the Veterans Administration Facility; aged 54; died, July 5.

Edward B. Kaple, Camillus, N. Y.; Cleveland University of Medicine and Surgery, 1895; past president of the Onondaga County Medical Society; for many years on the staff of the Syracuse Memorial Hospital; aged 66; died, July 26.

Hudson D. Bishop @ Cleveland; Homeopathic Hospital College, Cleveland, 1890; formerly professor of surgery at his alma mater; for many years on the staff of the Maternity Hospital; aged 72; died August 17, of heart disease.

Oliver James Wood, Cleves, Ohio; Miami Medical College, Cincinnati, 1883; past president of the county board of health and the Cleves-North Bend school district; aged 87; died, August 8, of arteriosclerosis and heart disease.

Rufus Joel Danner, Terre Haute, Ind.; Kentucky University Medical Department, Louisville, 1901; member of the Indiana State Medical Association; served during the World War; aged 65; died, August 26, of heart disease.

Joseph Maurice Allen, Rosholt, S. D.; Hamline University Medical Department, Minneapolis, 1901; aged 72; died, August 8, in St. Francis Hospital, Breckenridge, Minn., of gangrenous appendicitis and coronary occlusion.

Oliver S. Olson, Gary, Ind.; University of Illinois College of Medicine, Chicago, 1912; member of the Indiana State Medical Association; served during the World War; aged 55; died, August 20, of carcinoma of the intestine.

Delbert Frederick Dumas, Bemidji, Minn.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 60; died, August 8, of hypertensive heart disease and cerebral thrombosis.

Nathan Browne Hammond, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1903; demonstrator of pharmacy, 1905-1910, and lecturer, 1910-1911, at his alma mater; aged 62; died, July 18.

Calvin Ashley Traver, North Little Rock, Ark.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; aged 66; died, July 30, of pneumonia, intestinal obstruction and appendicitis.

Michael A. Cohn, San Diego, Calif.; College of Physicians and Surgeons, Baltimore, 1893; member of the Medical Society of the State of New York; aged 71; died, July 10, at La Jolla.

Albert E. Hussey, Cincinnati; Medical College of Ohio, Cincinnati, 1901; formerly connected with the U. S. Veterans Bureau; aged 59; died, August 1, of cerebral hemorrhage.

Frederick Walter Mason, Brandon, Vt.; Keokuk (Iowa) Medical College, 1897; aged 64; died, August 7, in a hospital at Rutland of gastric hemorrhage and diabetes mellitus.

Clarence Earl Hamel, Kalispell, Mont.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; aged 66; died, July 29.

Frederick Elisher Salvage, La Moure, N. D.; Rush Medical College, Chicago, 1892; member of the North Dakota State Medical Association; aged 72; died, July 14.

Ida Rebecca Brigham, Brookline, Mass.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; aged 89; died, July 3, of coronary sclerosis.

James Cannon Greene, Greenville, N. C.; Medical College of Virginia, Richmond, 1900; aged 70; died, August 15, in the Pitt General Hospital, of chronic myocarditis.

Henry John Abele, Lakewood, Ohio; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1898; aged 80; died, August 4, of heart disease.

William Albert Berry, Chicago; Rush Medical College, Chicago, 1903; aged 60; on the staff of St. Bernard's Hospital where he died, August 26, of angina pectoris.

William G. Ferguson, Rockville Centre, N. Y.; Fort Wayne (Ind.) College of Medicine, 1891; formerly school physician in Fort Wayne, Ind.; died, July 31.

Arthur Peter Shellman, Binghamton, N. Y.; University of the City of New York Medical Department, 1894; aged 69; died, July 16, of coronary thrombosis.

Louis H. Graham, Waxahachie, Texas; Louisville (Ky.) Medical College, 1889; member of the State Medical Association of Texas; aged 76; died, August 6.

Robert Brown Whiteside, Lott, Texas; College of Physicians and Surgeons, Baltimore, 1889; aged 73; died, July 28, of cerebral hemorrhage and arteriosclerosis.

La Forest Ethelbert Phillips @ Palo Alto, Calif.; Cooper Medical College, San Francisco, 1899; on the staff of the Palo Alto Hospital; aged 63; died in July.

Adam Henry Straub, Brooklyn; Long Island College Hospital, Brooklyn, 1889; aged 73; died, July 2, in the Wyckoff Heights Hospital, of diabetes mellitus.

John Darius Jackson, Perryville, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1881; aged 80; died, July 25, in Terrell of senility.

Noble Hind Hill, Boston; Boston University School of Medicine, 1892; aged 79; died, July 13, in the Boston City Hospital, of cerebral thrombosis.

Frank Walters Stuart, Seattle; Homeopathic Hospital College, Cleveland, 1890; aged 82; died, July 26, of cerebral hemorrhage and hypertension.

Henry Hertel, East St. Louis, Ill.; St. Louis Medical College, 1878; member of the Illinois State Medical Society; aged 89; died, August 22.

Mary Elizabeth Rosenberg Nelson, San Diego, Calif.; University of Nebraska College of Medicine, Omaha, 1897; aged 83; died, July 15.

William D. Mace, La Fayette, Ind.; Medical College of Indiana, Indianapolis, 1889; aged 71; died, July 31, of acute dilatation of the heart.

Sae T. Greenberg, Cleveland; Medizinische Fakultät der Universität, Wien, Austria, 1908; aged 59; died, July 19, of coronary thrombosis.

Frank R. Falby, Charlotte, Vt.; Baltimore Medical College, 1897; aged 72; died, July 30, of cerebral hemorrhage and arteriosclerosis.

David Scott Hoig, Oshawa, Ont., Canada; University of Toronto Faculty of Medicine, 1880; aged 85; died, August 7.

Moses Wiesh, San Antonio, Texas; Missouri Medical College, St. Louis, 1897; aged 85; died, August 14, of myocarditis.

C. C. Witt, Lake City, Fla.; Medical College of the State of South Carolina, Charleston, 1909; aged 55; died, July 19.

Charles Warwick McVicar, Winnipeg, Man., Canada; Manitoba Medical College, 1924; aged 38; died, August 12.

Sidney A. Hoesman, Cozaddale, Ohio; Cincinnati College of Medicine and Surgery, 1901; aged 79; died, August 4.

Bureau of Investigation

TWO ABORTIFACIENTS BARRED

1. Cosmo Carrano and His D. M. C. Pills

From New Haven, Conn., Cosmo Carrano, a quack said by government officials to have a criminal record, did a medical mail-order business under the trade style "Oceanview Medical Products" selling "D. M. C. Pills." In the opinion of Judge Vincent M. Miles, Solicitor for the Post Office Department, it was apparent that the advertising of this product indicated that it was an abortifacient. As he put it: "The evidence in this case shows that it is the promoter's [Cosmo Carrano's] intention to hold out his preparation as an abortifacient and that he is selling it through the mails for that purpose."

Carrano, according to Judge Miles's memorandum, had previously been convicted on five different occasions of

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OCEANVIEW MEDICAL PRODUCTS,
BOX 1709, NEW HAVEN, CONN.
Gentlemen:

☐ Full Strength
☐ Double Strength

Enclosed find _____ for _____
Name _____
Address _____
City _____ State _____

Oceanview Medical Products
Box 1709, New Haven, Conn.
Ladies Dept. M3-1-DP.

Some of Carrano's advertising.

possessing, selling or shipping obscene matter. According to the same memorandum, the Post Office Department issued a fraud order against Carrano in March 1936 for operating a mail-order swindle in the sale of books, pictures and cartoons.

In 1937, according to material in the files of the Bureau of Investigation of the American Medical Association, Carrano entered into a stipulation with another government agency, the Federal Trade Commission, to "discontinue representing directly or by reasonable implication that his preparation [D. M. C. Vegetable Pills] is an abortifacient." But Carrano was still selling his D. M. C. pills in 1939 when the Post Office Department again took a hand. He was called on to show cause on Feb. 23, 1939, why the postmaster at New Haven should not be instructed to stamp all mail addressed to Oceanview Medical Products "FICTITIOUS" and return all such mail to the senders or else send it to the Division of Dead Letters at Washington.

On February 21 Carrano's attorney, Walter J. McCarthy of New Haven, addressed a letter to the Post Office Department, stating that his client would be willing to sign a stipulation—another one!—agreeing to discontinue his scheme.

Naturally the Post Office officials took the attitude that, as they put it, "no reliance might be placed upon any promise" made by Carrano. Mr. McCarthy was notified that a hearing would be held at Washington on February 28. On that date Mr. McCarthy appeared on behalf of Carrano and a hearing that consumed half a day was held.

As Judge Miles brought out in his memorandum to the Postmaster General, Carrano's published testimonials were "shown to be from married women and indicate that the preparation [D. M. C. pills] sold in this scheme had relieved cases of delayed menstruation of two months and over, the inference being throughout such testimonials that the preparation [D. M. C.] actually accomplished abortion in such instances." The memorandum further stated that in a number of instances Carrano had sent his D. M. C. pills through the mails in cases in which they were expressly ordered for the purpose of effecting an abortion. (Italics ours—Ed.)

The evidence showed, according to the memorandum, that Cosmo Carrano was violating 18 U. S. Code 339 and 334, statutes that specifically prohibit the advertising and sale through the mails of any matter to be used for the purpose of producing abortion. On March 6, 1939, the mails were closed to Oceanview Medical Products.

2. "Bornock's Tablet Treatment"

On Jan. 21, 1939, Olaf M. Bornstad of Minneapolis was called on by the Post Office Department to show cause why the postmaster at Minneapolis should not be instructed to stamp all mail addressed to Bornstad's "Bornocks Company" as "FICTITIOUS" and either return it to the senders or direct it to the Division of Dead Letters at Washington.

On January 28 Bornstad's attorney, Olaf L. Bruce of Minneapolis, wrote the Post Office Department a letter in which he transmitted a statement from Bornstad, waiving a hearing and indicating a willingness to have all mail addressed to his company returned to senders. In the memorandum to the Postmaster General from the Solicitor of the Post Office Department, Judge Vincent M. Miles, it is brought out that Olaf M. Bornstad under the Bornocks Company trade style had been advertising and selling through the mails "Bornock's Tablet Treatment" as a means of producing abortion.

Bornstad solicited business, stated Judge Miles, "by the use of newspaper advertisements" and letters. Unfortunately the names of the newspapers that became *particeps criminis* with Bornstad were not given. On Feb. 15, 1939, the mails were closed to Bornstad's trade style, Bornocks Company, and its officers and agents as such, because the business was a violation of 18 U. S. Code 339 and 334.

THE INDIAN DRUG STORE FRAUD

From March 1934 until Jan. 17, 1939, Armon S. Compton of Philadelphia, who is said to claim that he is a pharmacist, had been selling two nostrums through the mails. The "patent medicines" in question were called, respectively, "Presta Tablets" and "Re-Gens Tonic Compound." These were sold not under Compton's own name but under the trade style "Indian Drug Store." The location was 1440 South Street and it appears that it was a small "botanical drug store" from which Compton also sold locally a general line of herbs.

Presta Tablets were supposed to restore lost sexual vitality, while Re-Gens Tonic Compound was apparently recommended for everything from hot flashes to cold feet. When analyzed the tablets were reported to contain damiana, strychnine, zinc phosphide, iron (ferric) oxide and a small amount of the inevitable cantharides (Spanish flies). The tablets were supposed to cure lost sexual vitality whether the condition was due to tuberculosis, diabetes, venereal disease, old age or to psychic causes.

The Re-Gens Tonic was reported on analysis to contain gentian, iron (ferric) oxide, salicylic acid and epsom salt—especially epsom salt—and a little calcium, sodium and potassium. The stuff was essentially a laxative. As such a mixture would not "keep your Blood, Stomach, Liver, Kidneys and Bowels in good condition" and would not enable persons to

"avoid Constipation, Dyspepsia, Sour Stomach, Bad Breath, Malaria, Sick Headache, Kidney Troubles, Liver Complaint, Loss of Appetite, Rheumatism, Lamé Back, Impure Blood, Pimples, Eczema, Boils" and so on, the scheme was declared a fraud and the mails were closed to the Indian Drug Store on the date given in the opening paragraph.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HYPOTENSION

To the Editor:—A woman of 45 who is otherwise healthy has a blood pressure of 80/42. What should be done to raise this blood pressure? Would thyroid extract be indicated?

I. Herman, M.D., Newark, N. J.

ANSWER.—It has been customary to separate chronic arterial hypotension into two types (primary, or essential, and secondary), but such distinction is largely arbitrary. The pathogenesis and disturbed homeostatic mechanisms are alike; the conditions differ only in obviousness of etiology. In some instances of habitual hypotension the causation is fairly obvious and in others obscure. The etiology of hypotension involves numerous factors. These are divisible into predisposing (constitutional) factors and provoking (initiating) influences. In clinical instances in which the provoking factors are obscure the predisposing causes usually predominate (Stieglitz, E. J.: *Abnormal Arterial Tension*, New York, National Medical Book Company, Inc., 1935).

To be effective, therapy must be based on correction or amelioration of the cause. In the present instance it must be assumed that no obvious intoxications, infections, dehydration or metabolic disturbances exist and that the hypotension is habitual and continuous rather than merely evidence of a transient depression of vascular tone. Careful search for sources of intoxication such as foci of infection, prolonged fatigue, tuberculosis and habitual use of depressant drugs should be conducted. Excessive self medication with any of the many generally available barbiturates, bromides and other sedatives is not an infrequent factor in habitual hypotension, but it is rarely admitted by the patient. The cardiac reserve is an important consideration, and one would wish to know the circulatory response to effort and the character and rate of the pulse. Should such clinical studies fail to elicit evidence as to the causation of the hypotension, then and only then supportive and stimulative therapy is justified.

Hypotension per se is not a disease. It is a physiologic state deviating from the accepted normal. Moderate hypotension may be and often is perfectly compatible with health and well-being. Only when hypotension is sufficient to impair circulatory efficiency and cause symptoms is one justified in instituting therapy; it is with the patient and not with the level of arterial tension that one should be concerned. Rest is probably the most effective measure. Hypotensive persons have a distinctly lowered endurance. Fitting the pace of living to the patient's capacity of activity can often do more good than any other measure. This applies to mental and emotional as well as physical strains. The program of daily routine can often be modified to yield short rest periods.

Improvement of nutrition is important. Many of these patients are grossly undernourished, while others are flabby and overweight. A diet planned to prevent constipation is desirable. Anemia, even of minor degree, should be energetically combated. Hypotension is frequently associated with deficient oxygenation. Apocamnosis encourages sedentary habits. Fresh air and exercise appropriate to the patient's strength are valuable.

Drugs are but auxiliaries in the management of habitual hypotension and must not be relied on to the exclusion of other measures. Strychnine sulfate (0.6 mg.) or the old-fashioned but effective elixir of iron, quinine and strychnine before meals may be continued profitably for weeks. Epinephrine has too fleeting an action to be applicable to the control of chronic hypotension; furthermore, it must be administered parenterally. Ephedrine salts and benzedrine have undesirable side effects such as insom-

nia, cardiac excitation and excessive cerebral stimulation and are thus best avoided. Thyroid extract is definitely indicated when the basal metabolic rate is low. It should never be prescribed without controlling observations of the basal metabolic rate, the pulse rate and the sense of well-being of the patient. Frequently it is tolerated surprisingly well by those whose metabolic rate is normal, and although the rate is but little increased considerable clinical benefit is obtained. The precaution of repeated observations of such patients should not be neglected. Appreciation of the fact that the discovery and correction of the causal influences is of major importance in treatment will insure better therapeutic results. The therapy required for each patient must be individualized.

BILE SALTS

To the Editor:—Could you give me a formula for a preparation of bile salts to be used in cases of chronic cholecystitis?

Albert Kaplan, M.D., Kech, Mo.

ANSWER.—Normal human bile obtained from the common or hepatic duct contains approximately 1 per cent of bile salts; in the bile in the gallbladder the concentration is from six to ten times greater. These bile salts consist chiefly of sodium glycocholate, sodium taurocholate, sodium cholate, sodium chenodeoxycholate and some sodium desoxycholate. Other bile salts are present in minute traces and there may also be small amounts of the free bile acids themselves. Ordinarily the ratio between sodium glycocholate and sodium taurocholate in normal human bile is about 3:1.

Ox bile, from which most commercial preparations of bile salts are made, does not differ greatly in composition from human bile in respect to the glycocholate:taurocholate ratio. Theoretically it would be possible to prepare a mixture of bile salts which would correspond closely in composition to that of normal human bile but to do so would be an expensive and difficult process.

Schmidt and his associates (Schmidt, C. R.; Beazell, J. M.; Atkinson, A. J., and Ivy, A. C.: *The Effect of Therapeutic Agents on the Volume and the Constituents of Bile*, *Am. J. Digest. Dis. & Nutrition* 4:613 [Nov.] 1938), working on dogs, found that preparations of conjugated bile acids are superior stimulants to the flow of bile and produce an increased excretion of normal biliary constituents. The oxidized unconjugated preparations increase the aqueous fraction of bile but result in an absolute decrease in the output of natural bile acid.

FORMATION OF GALLSTONES IN COMMON DUCT

To the Editor:—At a recent meeting the following questions elicited considerable discussion: Do stones form in the common duct of previously cholecystectomized patients or were such stones present and undiscovered at the time of operation? Why is symptomatic relief more pronounced when the gallbladder with stones is removed than when the "stoneless" or nonfunctioning gallbladder is taken out?

J. E. Morgon, M.D., Cleveland.

ANSWER.—It is probable that most stones found in the common duct of previously cholecystectomized patients represent stones that were present and undiscovered at the time of the original operation. There is conclusive evidence that stones may grow in the common duct and reach a large size and that, following their removal, a recurrence of similar large stones may take place, even though the gallbladder has been previously removed.

According to the observations of Phemister, Aronson and Pepinsky (*Ann. Surg.* 109:161 [Feb.] 1939), stone formation in the common duct is usually preceded by stone formation in the gallbladder and is set up after calculi have passed into the common duct with the resultant obstruction and infection. Rarely, stone formation may occur in the common duct independent of cholelithiasis, as in cirrhosis of the liver (Judd, *McIndoe and Marshall: Surgery of the Biliary System*, in *Lewis's Practice of Surgery*, Hagerstown, Md., W. F. Prior Company, Inc., 1929, vol. 7, chapter 2) or in carcinomatous obstruction of the ducts (Lampert, Ralph, and McFetridge, Elizabeth M.: *Carcinoma of the Hepatic Duct*, with Report of Additional Case, *Am. J. Cancer* 21:534 [July] 1934. Marshall, J. M.: *Tumors of the Bile Duct*, *Proc. Staff Meet., Mayo Clin.* 6:191-192 [April 1] 1931), and the stones may even form in the intrahepatic ducts. Phemister and his associates found that the stones which form in the biliary ducts are composed almost entirely of cholesterol and bile pigments with scarcely a trace of calcium. This is in sharp contrast to the stones that form in the gallbladder, in which calcium carbonate is commonly present in varying amounts.

Symptomatic relief is usually more pronounced when the gallbladder with stones is removed because in this case it is much more probable that the gallbladder was the original cause of the distress. In many cases, so-called functional intestinal distress or hyperirritability of the colon may quite accurately mimic the symptoms of classic gallbladder disease, and of course these symptoms then persist after the removal of the gallbladder.

The syndrome of biliary dyskinesia is not clearly defined, but it is quite possible that subjective symptoms might be produced by disturbance in the motility of the gallbladder or of the common duct and the sphincter of Oddi, in the absence of stones. The removal of such a gallbladder would clearly not give the relief that is commonly obtained in the presence of cholelithiasis. It is probable that, in most cases in which symptomatic relief is not obtained following cholecystectomy in the absence of gallstones or evidence of cholecystitis, the diagnosis is wrong.

CHORDOTOMY FOR PAIN

To the Editor:—For painful stump of an amputated thigh a patient was given paraspinal injection, presumably of alcohol. This was made at the third or second lumbar vertebra. The pain in the stump was almost entirely relieved, but in its place there are severe paroxysms of stabbing pain originating at the twelfth thoracic vertebra and radiating along the border of the last rib on both sides. Their severity demands constant sedation with opiates. Will you kindly inform me of the results of laminectomy and of chordotomy, or tell me where I can find these results summarized.

H. A. Hoskell, M.D., Windsor, Calif.

ANSWER.—Properly done by one experienced in procedures of neurologic surgery, chordotomy should completely relieve the patient of the pain. A small laminectomy should be done and a chordotomy performed at least four cord segments above the highest segment of pain distribution. With bilateral section of the pain-conducting pathways, between the dentate ligaments and the anterior roots, there will be a loss of pain and temperature sensibility below the level of the section but touch, pressure, position and vibratory sensibilities will not be impaired. The knife should pass completely through the white matter, between the landmarks named and well into the gray matter of the cord. With a careful operation, avoidance of hemorrhage around or in the cord and proper closure of the dura mater and muscles, there should be no loss of sphincter control or any motor weakness. In such a case chordotomy is no doubt preferable to posterior rhizotomy.

RHEUMATIC FEVER AND APHONIA

To the Editor:—A 4 year old girl has acute rheumatic fever of ten days' duration. She has received methyl salicylate externally and sodium salicylate internally in 5 grain (0.3 Gm.) doses four times a day, which has produced mild gastric symptoms and ringing in the ears when increased to five times a day. A slight but definite aphonia and some difficulty in swallowing has developed, the vagus being probably involved. There is no evidence of cardiac involvement other than rapid pulse. It would be greatly appreciated if you could suggest any therapy other than what is being given for the general condition and likewise any suggestions as to the mechanism of the vagus involvement and its treatment.

Charles H. Morhouse, M.D., Mitchelfield, L. I., N. Y.

ANSWER.—None of several authorities consulted have noted aphonia as a complication of rheumatic fever. In the presence of aphonia a reconsideration of the diagnosis may be in order; perhaps rheumatic fever exists coincidentally with some other condition that causes aphonia. Although salicylates in toxic doses may produce a number of neurologic symptoms, aphonia was not included in the list of Hanzlik (1927). Assuming that rheumatic fever with a related aphonia is present, the latter may be due to some local involvement and not necessarily to a disturbance of the vagus, or other cranial nerves may be responsible. Laryngitis occasionally occurs early in the course of rheumatic fever. Rheumatic nodules of microscopic size have been found in almost every tissue of the body. Occasionally, discrete nodules appear on the vocal cords. A serious and rare complication may be an acute diffuse edema of the epiglottis and vocal cords, which at times results in obstructive dyspnea. Aphonia may result from auricular enlargement or, assuming that no other central nerves are involved, one might think of a central (vascular embolic) lesion affecting the nucleus of the vagus nerve in the medulla; but this would necessitate the presence of frank endocarditis. In chorea, which is frequently associated with rheumatic fever, lesions of blood vessels and focal areas of encephalitis may occur. The data given by the correspondent are insufficient for one to make further conjectures as to the diagnosis.

If salicylates are not well tolerated when administered orally, they can be given in water by rectum 10 grains to the ounce

(0.65 Gm. in 30 cc.) or in a weak solution of starch. If salicylates are not effective in controlling fever and the articular disease, aminopyrine may be effective. A complete review of the current methods of treatment of rheumatic fever can be found in the Fifth Rheumatism Review (*Ann. Int. Med.* 12:1005 [Jan.] 1939).

DILUTION TEST OF KIDNEY FUNCTION

To the Editor:—Kindly give me the details of the kidney function test which eight glasses of water are given. Also the interpretation of the test.

C. G. Bower, M.D., Galesburg, Ill.

ANSWER.—In carrying out the dilution test for kidney function, according to Volhard's technic, the patient empties the bladder on arising and then drinks eight glasses (1,500 cc.) of water or weak tea in the course of from thirty to forty five minutes. He must remain in bed during the test period of three or four hours and refrain from food or drink. He is asked to urinate every half hour, keeping each urine in a separate container. The volume and specific gravity of the individual urines are measured. Normally, excretion of the ingested fluid is complete within two or three hours, at the most in four hours. More important as an index of normal renal function is the variation in the volume and specific gravity of the half hour urines. The largest half hour output may reach from 500 to 1,000 cc. (1 pint to 1 quart), with the specific gravity as low as 1.001. With impairment of renal function the first change is the reduction of the maximum half hour output and failure of a sharp fall in the specific gravity. Later the total four hour volume falls below the intake of fluid, and finally, the half hour samples become small and uniform both in volume and in specific gravity.

While the test is exceedingly simple, interpretation may be difficult in the case of an abnormal outcome, because the response of the body to a single large volume of water is determined by extrarenal as well as by renal factors. Thus, in the presence of cardiac or renal edema and even when there is only a tendency to edema, as in early cardiac failure and in the later months of pregnancy, much of the ingested fluid may be retained although there may still be considerable variation in the half hour urines. Any form of dehydration preceding the dilution test may seriously disturb the results. Thus fever, diarrhea, excessive perspiration and other conditions must be taken into account. The amount of salt in the diet on the day preceding the test may also affect the excretion of the water given. In most cases it becomes necessary to carry out a concentration test in order to obtain a reliable measure of renal function. It is evident that the dilution test may be a dangerous procedure in cases of increasing cardiac failure and pulmonary congestion or with severe hypertension and symptoms of encephalopathy, or in acute nephritis with oliguria and progressive edema. On the whole, the dilution test is not reliable and should be supplanted by the concentration test.

PROLONGED CARDIAC INVALIDISM IN CHILDREN

To the Editor:—I would appreciate your advice and your listing at schools, if any, for a boy aged 16 with rheumatic heart disease who is mentally alert but rebels daily that he cannot work. The condition of his heart is poor. At present he is in bed with rheumatic fever. His parents, not too wealthy, are willing to do anything to alleviate his boredom. I suggested a cardiac school, but I don't know whether there are any, and, if there are, where they are. Thank you for any help you can give me. The boy lives in Vermont.

M.D., Lynn, Mass.

ANSWER.—One of the difficult problems that has faced those treating prolonged rheumatic infections in childhood has been to maintain the morale and relieve the boredom of the children who have to stay in bed for months or even years.

There are certain hospitals where such children are well cared for over periods of time with an excellent environment and attention to the medical needs of the child. During convalescence recreational therapy and occupational therapy are instituted, but it is not necessary for children to be in such hospitals. They can be adequately taken care of at home if there is an understanding of their needs. The pioneer work of Miss Edith Terry and her associates at the Children's Heart Clinic of the Massachusetts General Hospital (with the help of the Committee for the Home Care of Children with Heart Disease) has resulted in the development of great advances in this field. Information can be obtained from her about the measures which she has introduced.

Among such measures are the establishment of the "In Bed Club" with its magazine, its jacket, its badge and other attri-

butes. Miss Love, who is one of Miss Terry's associates, has become expert in developing the use of the leisure time when the children are not too sick. Although care must be exercised as to the amount of activity of the children in bed in relation to the severity of their acute illness, it is even possible for them while still in bed to earn funds for their family, especially helpful if other members of the family are out of work.

URINARY INCONTINENCE AFTER PROSTATECTOMY

To the Editor:—A white man aged 73 had a transurethral prostatectomy in October 1938. Since then his general condition has been good, except for a generalized arteriosclerosis. Follow-up examinations in the hospital seem to show normal progress. However, a postoperative incontinence developed with a highly alkaline urine. Acidifying agents have failed so far to render the urine acid. The patient has been compelled to wear a urinal, but during the day only. At night he does not wet his bed, even though he is not wearing the urinal. The output during the night (12 midnight to about 9 a.m.) has been much higher than during the day. There is no infection. Since androgenic substance has been found valuable in the treatment of prostatic hypertrophy I should like to know whether it would be of help in correcting the incontinence also. Exercising the sphincter having been suggested already, what else can be done?

M.D., New York.

ANSWER.—The history given indicates that there is probably a urea-splitting organism in the urinary tract. As this contaminant is probably responsible for considerable bladder irritability attention should first be given to its eradication. Since it is almost impossible to acidify the urine in the face of this group of organisms the drug of choice is sulfanilamide, as its best action is in urine of alkaline reaction. Frequently, however, such patients become afflicted with alkaline encrustations on the operative site, which may necessitate instrumental removal either transurethrally or by means of cystostomy. In any event, diagnostic cystoscopy and a gram stain of the centrifuged specimen of urine, or even cultures of the urine, are indicated.

Although many claims have been advanced for androgenic substance it is doubtful if treatment of postoperative incontinence with this agent has ever been successful. However, if the patient does not have hypertension, ephedrine in three-eighths grain (0.024 Gm.) doses once or twice a day may be effective in stimulating the sphincter. Other agents of this type are strychnine in small doses ($\frac{1}{320}$ grain [0.00054 Gm.]) and benzedrine sulfate. Of course it is necessary to calibrate the urethra so that it will accommodate at least a 24F catheter, as strictures are frequent following transurethral resections and may be productive of incontinence. Exercising the sphincter is of definite value. If all of these means are of no avail it may be more convenient for the patient to use a Cunningham clamp than the more cumbersome urinal.

THROMBOSIS OF AXILLARY OR SUBCLAVIAN VEINS

To the Editor:—A man aged 54 sustained a contusion on the left upper arm. Five days later the basilic vein was enlarged and ropelike throughout its entire course. A few days later the entire left arm was cyanotic and swollen, especially the upper arm and hand. The cephalic vein was enlarged and varicose and the veins on the anterior surface of the chest were also enlarged. After eight weeks of complete rest in bed the basilic vein became normal, but the entire left arm and hand are still generally enlarged and slightly cyanotic, especially when held in a dependent position. The cephalic vein is still enlarged and varicose and the veins on the chest, while less pronounced, are still enlarged. From the symptoms, it appears that the thrombosis has extended to and involved the axillary or subclavian vein. The patient has been given increasing doses of potassium iodide and is now permitted to use the left arm for light duty. As the original injury occurred four months ago, what should be the prognosis and what treatment should be prescribed? May the moderate use of alcohol and tobacco be permitted?

M.D., Missouri.

ANSWER.—The description of the case permits the diagnosis of a thrombosis of the axillary or possibly subclavian vein with the characteristic collateral circulation on the chest wall and an increase of venous pressure in the superficial veins of the arm. It would be advisable to determine the location of the venous obstruction by an intravenous injection of an opaque, iodine-containing solution such as neo-iodipax or hippuran. A block of the sympathetic fibers going to the arm might be done to see how much of the swelling and cyanosis is due to a reflex vasoconstriction maintained by the thrombosed venous segment. By far the most satisfactory treatment is the resection of the occluded vein, which is most often exposed by a subclavicular, transpectoral incision. Relief from edema and cyanosis may occur spontaneously, but the process is unpredictable and may end up in severe neuralgia on exercise, a type of intermittent claudication.

It is doubtful whether the moderate use of alcohol and tobacco would influence this condition.

ASTHMA AND MENSTRUATION

To the Editor:—A white woman aged 36 has had allergic asthma since the onset of menstruation at the age of 12. In the beginning it would trouble her only for a few days before the menstrual period but now it is present in mild form (easily controlled by symptomatic treatment) throughout the cycle but becomes almost intractable a few days before the period and is relieved only with the onset of bleeding. She is the mother of six children, the youngest 2 years of age. Each pregnancy has resulted in complete remission of all asthmatic attacks after the first one to three months. She has had no miscarriages or abortions. General physical examination, including a check of the sinuses, a blood count, a Wassermann test and urinalysis, revealed no significant indications except for a moderately emphysematous chest. Pelvic examination was not remarkable. The sputum during attacks shows abundant eosinophils, and differential counts done at these times have shown moderate (from 6 to 10 per cent) eosinophilia. She will not submit to skin testing. The patient has arranged to make the bedroom as nearly dust free as possible and has been an elimination diets but has not been benefited. I have treated her now for one year on theophylline with ethylene diamine by mouth up to 15 grains (1 Gm.) in twenty-four hours and occasional doses of epinephrine 3 minims (0.2 cc.), which gives good symptomatic control in the intramenstrual period—much better than larger and more frequent dosage of epinephrine without theophylline with ethylene diamine or with ephedrine and phenobarbital compounds had previously done. The premenstrual attacks are, however, becoming more severe. Intravenous theophylline with ethylene diamine ($7\frac{1}{2}$ grains [0.5 Gm.]) with 30 cc. of 50 per cent dextrose, frequent epinephrine, rare doses of morphine and sodium pentobarbital up to 3 grains (0.2 Gm.) see her through this hectic period. On several occasions she has seemed practically moribund. It has been noted by the patient that any febrile state was followed by a period of partial or complete remission of symptoms. Fearing to use any kind of fever therapy at my disposal except autogenous blood, I have on two occasions induced mild fever (102 F.) by repeated injections of her blood intramuscularly. This empirical treatment has resulted in temporary improvement. The questions I now wish to ask are: 1. What would be the result of x-ray castration? Would such a procedure be justified? 2. Have you any confidence in endocrine therapy? If so, what? (This has been suggested by a consultant.) 3. Have you any additional suggestions as to symptomatic treatment? Would you advise the trial of epinephrine in oil in place of regular 1:1,000 epinephrine?

R. E. Shaw, M.D., Clarksville, Iowa.

ANSWER.—This query brings up two important considerations in the treatment of bronchial asthma. In the first place the phrase "she will not submit to skin testing" is unthinkable in this day and age. There has been a great improvement in the making and in the interpretation of skin tests. It is not an ordeal, as implied. The tests are painless if done cutaneously, and if carried out intracutaneously the pain is slight. No after-effects should follow skin testing but the testing should be carried out by one who has had experience and who can make all the necessary tests, both cutaneous and intracutaneous. In a patient who is only 36 the substance or substances which cause the asthmatic attacks should be discovered, especially since eosinophilia is present. The patient should be persuaded to have these tests done.

The relationship of bronchial asthma to menstruation and pregnancy has received a great deal of consideration and the consensus is that there is a definite connection. But no one has been able to prove that menstruation is the underlying cause of asthma. One must realize that menstruation is merely a predisposing factor in asthma; there is usually a hereditary factor and the attacks are precipitated by exposure to some such substance as pollen, molds, house dust, drugs or certain food. Every one agrees that many female asthmatic patients are worse just before the flow and feel better as soon as menstruation begins. Because of this, many physicians give injections or tablets of ovarian material. Injections once a week of an extract of the whole ovary are probably most commonly used, and in many cases excellent results are obtained; the amount of asthma is frequently much lessened by its use.

X-Ray castration for asthma is not warranted, especially for a patient so young. Artificial menopause is sometimes followed by intractable asthma. Epinephrine in oil intramuscularly gives longer relief than 1:1,000 epinephrine subcutaneously.

PUSTULAR PSORIASIS OF HEEL

To the Editor:—Is there such a condition as "pustular psoriasis of the heels?" The patient has shown no other signs of psoriasis since the onset of the condition of his heels two years ago. There is hyperkeratosis with associated pustulation of the heels in which the new pustules persist for several days and then are apparently absorbed but with further resultant exfoliation of the overlying layers of the skin. Therapy has included roentgen and ultraviolet radiation and all sorts of fungicides. Constitutional therapy has not been neglected. Improvement seems to proceed to a certain point and then the condition either gets worse, if neglected, or remains stationary, if treatment is continued.

M.D., Virginia.

ANSWER.—Pustular psoriasis occurs on the palms and soles and may be associated at times with ordinary psoriatic patches elsewhere on the skin. The lesions are characterized by exfoliation and insets of intra-epidermic lakes of sterile pus. It needs to be differentiated from eczematoid ringworm and acroderma-

itis perstans of Hallopeau. The relationship to so-called pustular bacterid is much debated. Some dermatologists believe that pustular psoriasis, acrodermatitis perstans and pustular bacterid are mere variants of one another clinically and histologically. In its most characteristic form, however, pustular psoriasis may be differentiated from acrodermatitis perstans of the palm by the fact that in the former the lesions originate on the thenar and hypothenar surfaces, whereas in the latter they first involve the regions about the nails. In acrodermatitis there is atrophy, even of the phalanges, while in pustular psoriasis there is none. The pustules are sterile in pustular psoriasis, while they often contain staphylococci in acrodermatitis.

In pustular bacterid, which many believe is identical with pustular psoriasis, the best therapeutic responses have followed the eradication of foci of infection. These have been found most frequently in the tonsils and teeth. Stimulating agents applied locally often are found to irritate. In pustular psoriasis also one should on general principles seek foci of infection. If any are found they should of course be eradicated. Such general measures as are applicable for other types of psoriasis may be employed, such as the administration of arsenic. Pustular psoriasis resists ordinary local therapy. A combination of chrysarobin and ultraviolet radiation has been found useful. Roentgen therapy may be helpful. These remedies should not be used too long if they are ineffective, nor should their dosage go beyond a safe limit.

CHRONIC LETHARGIC ENCEPHALITIS

To the Editor:—A white man about 23 years of age had what he says was a mild case of scarlet fever and mumps about five years ago. Since that time he has been drowsy and lethargic, especially late in the day. He says that the condition is no worse now than it was four years ago, but he is more conscious of it and worries all the time. His wife states that he talks more slowly and does not smile as much or take an interest in his friends and surroundings. He refuses to go out with other people, as he is afraid they will notice his trouble. The only other complaint is shortness of breath. Physical examination is essentially negative. He is well developed. The tonsils are hypertrophic. The facial expression is rather blank; however, he does appreciate a good joke. The superficial reflexes are somewhat hyperactive. No pathologic reflexes are present. I have termed this encephalitis with a slight tendency toward paralysis agita. As to treatment, I am using benzedrine sulfate. The questions in my mind are: Is the benzedrine a curative measure or does it only give symptomatic relief? In view of the fact that the patient has gone four years without getting any worse, is there any chance of complete recovery? Would hospitalization with studies of spinal fluid and x-ray examination of the skull be of any advantage? I am allowing the patient to continue his work; would bed rest be better? Is it better to use stramonium with the benzedrine?

J. F. Hattenbach, M.D., Cleveland.

ANSWER.—Benzedrine sulfate is used for symptomatic relief only if the patient has encephalitis. The chronic lethargic encephalitis due to influenza is usually an incurable affliction. Occasionally patients are seen whose symptoms are mild and who under proper medication improve so much that it appears that the patient has made a recovery. The pathology of encephalitis due to influenza, on the one hand, is such as not to permit recovery. Encephalitis following scarlet fever and mumps, on the other hand, usually clears up completely. Spinal fluid examination should be made. It may show evidence of abnormalities in the cell count, globulin content and colloidal gold reaction. The pressure of the fluid should be determined by a manometer with testing for subarachnoid block. The patient should work if possible. It is suggested that he be given 30 drops of tincture of stramonium three times daily for one week, then 50 drops three times daily for another week and 75 drops three times daily from then on; 10 mg. of benzedrine sulfate should be given in the morning and at noon. No benzedrine should be given after 3 p. m. because of its tendency to produce insomnia.

EXOPHTHALMOS AFTER THYROIDECTOMY

To the Editor:—Can you give me some information on the treatment of exophthalmos which follows thyroidectomy for acute exophthalmic goiter? Following the operation there was only a slight protrusion of the eyes, but approximately six months later the left eye became extremely prominent and the right eye a little more than at first. This exophthalmos is severe. The patient has a —12 basal metabolic rate. I am interested in knowing whether or not the administration of thyroid or any other therapeutic agent is of any value in this type of case or whether surgery offers the only possibility of relief.

M.D., N. Y.

ANSWER.—Sometimes exophthalmos of the type described is relieved by the administration of iodine. This may cause the basal metabolic rate to be reduced to a lower level, with symptoms of hypothyroidism. It may therefore be necessary to give both iodine and thyroid. This is the only hope of relieving the condition medically. Surgical procedures should not be resorted to unless the exophthalmos is so pronounced that prolapse of the eyeball or corneal ulcers occur.

IMMUNITY TO TETANUS

To the Editor:—Will you please send me any information on record as to whether or not recovery from a tetanus infection will confer permanent immunity.

Ralph E. White, M.D., Santa Ana, Calif.

ANSWER.—The question cannot be answered until such a patient has been followed over a period of years with tests of the blood serum for amounts of tetanic antitoxin persisting. There is every reason to believe however that, if a person has once had an attack of tetanus and has recovered, response to a second infection would be more prompt and effective. The anamnestic antibody response is a well known phenomenon and has been shown to apply to reinjections of tetanus toxoid. Practically, however, if the antitoxic content of the serum is not known, prophylactic injection of tetanic antiserum is the only safe procedure in any condition in which tetanus is likely to develop.

POSSIBLE CONGENITAL SYPHILIS

To the Editor:—A woman aged 28 was treated throughout her pregnancy intensively with neorsphenamine and a bismuth compound. At term her Wassermann reaction was 4 plus, but she gave birth to an apparently normal child with a negative Wassermann reaction. Should this child receive antisyphilitic treatment, and if so at what age and in what amount? Another case is exactly the same except that the second child has a positive Wassermann reaction. What treatment would you advise in this case and at what age?

M.D., New York.

ANSWER.—The information given in regard to the first baby is inadequate. If the blood serologic studies were done within eight weeks after the baby's birth, the report is not entirely reliable as to the presence of syphilis in the child. However, if subsequent serologic tests have shown the child's blood to be negative and if the baby has no clinical evidence of syphilis there is no need of treatment for syphilis. Each month after the second month of life that the serologic tests are reported negative, the greater becomes the probability that the child does not have syphilis. Accordingly, if the child is now more than 2 months old and the tests are negative there is no need of treatment for syphilis. Continued observation and reexamination for syphilis until the child is at least 2 years of age are, however, advisable.

If the time factors have been given the same consideration in the second case as in the first, the second child should be treated for syphilis immediately. If the positive test was taken when the child was more than 2 months old, treatment is indicated. If, however, the blood was taken from the umbilical cord or during the first month of life, the test is in reality a test of the mother and not the child, because the substance which produces a positive Wassermann reaction may have been carried over to the child, which would not produce syphilis. On the other hand, if *Spirochaeta pallida* as well as the substance x was transmitted, the child will develop syphilis. In the interpretation of the serologic tests in the newborn the time factors are most important, and they were not stated in either of these cases. If the second child has syphilis, treatment should be started immediately. The method and manner of treating a newborn child for syphilis has been outlined in a recent publication of the Cooperative Clinical Group and may be obtained from the Venereal Disease Division of the United States Public Health Service, Washington, D. C.

FLEISCHMANN'S YEAST—ALLERGENS IN RICE

To the Editor:—In the two recipe books for allergic patients which have been published recently I find conflicting statements with regard to Fleischmann's yeast: One says that the product is made of tapioca and the other says that it is made of wheat. Each book claims to quote the makers. Can you tell me which of these is correct? Can you tell me whether wild rice contains the same allergen as polished or brown rice?

M.D., Illinois.

ANSWER.—Both recipe books are partly correct. The label for Fleischmann's yeast states that the product is fresh yeast with cereal or tapioca flour, and it is probable that the product contains either ingredient depending on market conditions.

Wild rice is a species of rice found in Canada, in the United States and in other parts of the world. Wild rice belongs to the genus *Zizania*, while the common brown rice belongs to the genus *Oryza*. Although it is a different genus, it belongs with common or brown rice in the family of Gramineae or grasses. It is difficult to say whether it has the same allergen, but it undoubtedly behaves as do other members of the Gramineae. In other words, it is likely to have an antigen common for the Gramineae in addition to an antigen which is specific for the genus or species. Generally speaking, the relationship is close enough so that it would not be advisable to substitute one for the other in case of allergy to one of these rices.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, October 14, page 1511.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written*. Part I. Various places throughout the United States and Canada, Feb. 15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Orol*. Philadelphia, Nov. 3-4. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written*. Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written examination and review of case histories (Part I) for Group B candidates will be held in various cities of the United States and Canada, Jan. 6. The final date for receipt of these applications was Oct. 4, 1939. General orol and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 8-11. Applications for admission to Group A, Part II examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).*

AMERICAN BOARD OF OPHTHALMOLOGY: *Written*. Various cities of the United States and Canada, March 9. Oral. New York, June 10. Formal applications must be received before Jan. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Boston, Jan. 20-21. Applications must be filed on or before Nov. 1. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PATHOLOGY: Memphis, Nov. 22-23. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics, Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, December. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlanta, Ga., Dec. 9-11. Sec., Dr. Byrl R. Kirklin, 102-110 Second Avenue S.W., Rochester, Minnesota.

AMERICAN BOARD OF SURGERY: Part II. Atlanta, Ga., Nov. 15. *Will include candidates living in the South only.* Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. (The only examination session to be held in 1940.) *Case reports must be submitted not later than November 9.* Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Maryland June Examination

Dr. John T. O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held at Baltimore, June 20-23, 1939. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. One hundred and fifty-two candidates were examined, of whom 145 passed and seven failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939)		83.3
George Washington University School of Medicine.....	(1939)		85.2
Georgetown University School of Medicine.....	(1939)		90
Northwestern University Medical School.....	(1939)		83.3
Rush Medical College.....	(1937)		88.5
Louisiana State University School of Medicine.....	(1937)		79.2
Johns Hopkins University School of Medicine.....	(1935)		83
(1936) 89, (1937) 83, (1938) 80, 83.3, 85, (1939) 77.5, 78.3, 79.2, 80.1, 81, 81.1, 82.1, 82.2, 83, 83.2, 83.3, 84, 84.4, 84.2, 84.4, 85, 85, 85, 85, 85.5, 86, 86.1, 86.2, 86.6, 87, 87, 87, 87, 87, 87.1, 87.2, 87.2, 87.4, 88, 88, 88.5, 90, 90.2,			
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1937)		81.3
(1938) 80, 82.2, 83.4, 84, 85.2, (1939) 78.1, 78.2, 78.3, 79.3, 79.3, 79.5, 80.2, 80.2, 80.4, 80.5, 81, 81, 81.5, 82, 82, 82.2, 82.3, 82.5, 82.5, 83, 83, 83, 83.3, 83.4, 83.5, 84, 84, 84, 84.2, 84.3, 84.3, 84.4, 84, 85, 85, 85, 85.2, 85.3, 85.4, 85.5, 85.6, 86, 86.1, 86.2, 86.3, 86.4, 86.5, 86.5, 86.5, 87, 87, 87, 87, 87.1, 87.1, 87.4, 88, 88, 88, 88.3, 89, 89, 89.1, 89.1, 89.2, 89.5, 90.4, 90.5, 90.5, 91, 92			
Harvard Medical School.....	(1939)		81.3
New York University College of Medicine.....	(1939)		81, 86.3
Duke University School of Medicine.....	(1939)		79.2*
University of Oregon Medical School.....	(1937)		82.2
Medical College of Virginia.....	(1939)		85.2

Medizinische Fakultät der Universität Wien.....	(1912)	78,
(1928) 83.2, (1932) 78.3		
Hessische Ludwigs-Universität Medizinische Fakultät, Giessen.....	(1910)	81
Universität Heidelberg Medizinische Fakultät.....	(1904)	77.1

School	FAILED	Year Grad.
George Washington University School of Medicine.....	(1935)	
Medizinische Fakultät der Universität Wien.....	(1913), (1930)	
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....	(1924)	
Philipps-Universität Medizinische Fakultät, Marburg.....	(1923)	
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1936)	
Regia Università di Napoli Facoltà di Medicina e Chirurgia.....	(1933)	

Twenty-four physicians were licensed by reciprocity and nine physicians were licensed by endorsement from January 26 through July 20. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.....	(1918)		California
College of Physicians and Surgeons of San Francisco.....	(1905)		Penn.
Georgetown University School of Medicine.....	(1926), (1929)		Dist. Colum.,
(1932) Minnesota, (1938) New York			
Loyola University School of Medicine.....	(1938)		Ohio
Northwestern.....	(1935)		New Jersey
Rush Medical.....	(1931)		Penn.
Johns Hopkins.....	(1922)		New York
Tufts College Medical School.....	(1930)		New York
University of Michigan Medical School.....	(1924)		Michigan
University of Nebraska College of Medicine.....	(1936)		Nebraska
Cornell University Medical College.....	(1934)		New York
University of Oregon Medical School.....	(1936)		Oregon
Jefferson Medical College of Philadelphia.....	(1923)		Ohio
University of Pennsylvania School of Medicine.....	(1932)		Penn.
Medical College of the State of South Carolina.....	(1938)		S. Carolina
University of Vermont College of Medicine.....	(1935)		New York
Medical College of Virginia.....	(1936)		Virginia
Univ. of Virginia.....	(1937)		Virginia
University of Manit.....	(1926)		Louisiana

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....	(1939, 2) N. B. M. Ex.		
George Washington University School of Medicine.....	(1937) N. B. M. Ex.		
Northwestern University Medical School.....	(1934) N. B. M. Ex.		
University of Minnesota Medical School.....	(1935) N. B. M. Ex.		
Cornell University Medical College.....	(1935) N. B. M. Ex.		
New York University, University and Bellevue Hospital Medical College.....	(1933) N. B. M. Ex.		
University of Pennsylvania School of Medicine.....	(1918) N. B. M. Ex.		
Vanderbilt University School of Medicine.....	(1936) N. B. M. Ex.		

* License withheld pending completion of internship.

Louisiana June Report

Dr. Roy B. Harrison, secretary, Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, June 1-3, 1939. The examination covered twelve subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and forty-three candidates were examined, all of whom passed. Seven physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School.....	(1939)		83.6
School of Medicine of the Division of the Biological Sciences.....	(1938)*		83.1
Louisiana State University School of Medicine.....	(1939)†		82.2,
82.9, 83.1, 83.6, 83.7, 83.7, 84.2, 84.2, 84.4, 84.5, 84.7, 84.7, 84.8, 84.9, 85, 85.1, 85.2, 85.2, 85.2, 85.4, 85.5, 85.5, 85.5, 85.5, 85.6, 85.6, 85.7, 85.8, 85.9, 85.9, 86, 86.1, 86.1, 86.1, 86.2, 86.2, 86.3, 86.4, 86.4, 86.4, 86.6, 86.7, 86.7, 86.9, 87, 87, 87, 87.5, 87.6, 87.8, 88.1, 88.3, 88.4, 88.7			
Tulane University of Louisiana School of Medicine.....	(1938)		88.2,
86.6,* (1939) 84.7,† (1939) 80.5, 80.5, 80.9, 81, 81.4, 81.4, 81.5, 81.5, 81.5, 81.8, 81.9, 82.4, 82.5, 82.5, 82.6, 82.7, 82.7, 82.7, 83, 83.2, 83.5, 83.7, 83.7, 83.8, 83.8, 83.8, 83.8, 83.9, 83.9, 83.9, 83.9, 84.4, 84.4, 84.1, 84.1, 84.1, 84.2, 84.3, 84.3, 84.3, 84.4, 84.4, 84.4, 84.5, 84.5, 84.7, 84.8, 84.9, 85, 85, 85.1, 85.2, 85.2, 85.2, 85.5, 85.5, 85.6, 85.9, 86, 86.1, 86.3, 86.4, 86.4, 86.5, 86.5, 86.7, 86.7, 87, 87.1, 87.1, 87.3, 87.8, 87.8, 88.4			
Johns Hopkins University School of Medicine.....	(1923)		84.3
Tufts College Medical School.....	(1936)		83.8
Creighton University School of Medicine.....	(1938)		80.8

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1935)		Arkansas
University of Pennsylvania School of Medicine.....	(1925)		Mississippi
University of Pittsburgh School of Medicine.....	(1924)		Penn.
University of Tennessee College of Medicine.....	(1936), (1937)		Tennessee
Baylor University College of Medicine.....	(1930), (1933)		Texas

* License withheld pending completion of internship.

† These applicants have received the M.D. degree and will receive the M.D. degree on completion of internship. Licenses have not been issued.

‡ License withheld pending completion of internship and United States citizenship.

§ Licenses withheld pending completion of internship.

Book Notices

New and Nonofficial Remedies, 1939. Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1939. Cloth. Price, \$1.50. Pp. 617. Chicago: American Medical Association, 1939.

New and Nonofficial Remedies is of interest and value to many classes of persons who are concerned with the use of medicinal preparations—physicians, pharmaceutical manufacturers, chemists, pharmacologists, government officials, teachers, medical students and ultimately the lay consumer, in whose interest that of all must be judged.

To the physician the book is a reliable source of therapeutic and posologic information on the newer *materia medica*. To the pharmaceutical manufacturer it represents a record of the best achievement in his field and a goal toward which he may bend his efforts in improving his own ends. To the chemist it is a book of standards. To the pharmacologist it represents a compendium of knowledge of the newer drugs. To the government official it represents a book of standards for preparations which have not become official and a yardstick on permissible therapeutic claims made for new products of proved or promised therapeutic value. To the teacher it is such a text on progressive modern *materia medica* as is nowhere else available. To the medical student it is a valuable source of training in rational therapeutics, a *vade mecum* for his subsequent professional career. To the lay consumer it is a valuable protection that operates indirectly through his physician. Criticisms of the form and manner of presentation of data in this book have been made with justification from the points of view of the various classes enumerated. The fact remains, however, that each can find in it what he looks for if he will take the trouble to use the paraphernalia provided.

New and Nonofficial Remedies 1939 conforms to the general pattern of the thirty-two annual volumes which have preceded it. Some new drugs have been added, a great many new dosage forms of already accepted drugs have been added, some drugs have been omitted either for conflict with the rules or because they have been taken off the market. Most noteworthy among the newly accepted drugs are the crystallized estrogenic preparations Estrone (theelin) and Estriol (theefol). In line also with the modern trend toward the use of crystalline principles instead of extractive preparations are the new crystalline vitamin principles Thiamin Chloride (crystalline vitamin B₁ hydrochloride), Nicotinic Acid (vitamin B₂) and Nicotinic Acid Amide. Other newly included drugs are Benzedrine Sulfate, Prostigmine (as the bromide and methylsulfate) and Immune Globulin (Human).

Noteworthy omissions are those of serobacterins, because of failure to live up to their promise of therapeutic value, and "Suppositories Salyrgan", found to be the cause of undesirable irritation.

The chapter formerly called Organs of Animals has been dispersed and the various endocrine preparations formerly included in this chapter appear alphabetically under their individual names: Ovary, Pancreas, Parathyroid, Pituitary and Thyroid. Drastic revision of the monograph Ovary was made necessary by the addition of new crystalline principles.

The chapter Vitamins and Vitamin Preparations has been revised to use the newer chemical nomenclature to present the "Allowable Claims" up to date. Other revisions are found in the articles Anesthetics Local, Bismuth Compounds and Fibrin Ferments and Thromboplastic Substances.

Dissociation of Tubercle Bacilli: Investigations on the Mammalian Types Including BCG. By J. Frimodt-Møller. *Acta tuberculosa Scandinavica*, Supplementum II. Paper. Pp. 256, with 49 illustrations. Copenhagen: Einar Munksgaard, 1939.

This extensive monograph in English on the dissociation of tubercle bacilli, presented to the University of Copenhagen in fulfillment of the requirements for the degree of doctor of medicine, also appears in the *Acta tuberculosa Scandinavica*. It is a laudable volume from the standpoint of reviewing ably a subject which has been controversial from its explosive inception about a decade ago. The author reports on part of extensive investigations (reported in 1932 and 1935) carried out in the tuberculosis department of the State Serum Institute at

Copenhagen on matters relating to the types of tubercle bacilli. The purpose at hand was to study the variations of bovine and human strains isolated from tuberculous material from human beings and cultivated on artificial nutrient mediums and to examine any possible changes of their virulence. It was beyond the scope of the work to describe strains which displayed variations solely as a result of animal passages. These investigations having proved to be closely related to studies on variations in the growth of tubercle bacilli carried out by other workers, it was natural to include tests of their results and methods and to supplement them with dissociation experiments on the BCG strain. A possible justified criticism might be offered that this is not an original investigation but a repetition or verification study in which no newly devised methods are used with a view to advancing the horizon of knowledge on this subject. Thus also the conclusions give little new information for so extensively recorded an investigation. However, many will welcome this book for its rounded presentation of the previous investigations on dissociation (chapter II) and further attempts to dissociate BCG (chapter III). Besides dissociation, generally understood to mean variation in the structure of bacterial colonies, which variation may be associated with a change in virulence (a term first employed by Petroff in 1927), the author utilizes the Royal British Commission on Tuberculosis terminology of 1907 in which a convenient term for the greater or lesser facility with which a tubercle bacillus grows on artificial nutrient mediums was introduced, the words dysgonic and eugonic meaning respectively a sparse and a vigorous growth.

The chief impression gained by the author when looking back on the investigations reviewed is the great multiplicity of observations, which however in only few cases will bear close examination. Thus it seems justifiable to report a series of experiments in which it has been possible, according to the author, with a simple technique to reproduce dissociations with strains of both human and bovine types. In addition, experiments on the dissociation of the BCG strain are included. Chapters VI to XII are taken up with a consideration of the author's investigations, and an appraisal and summary are included in chapters XIII and XV, with an appendix of experimental records. The points made in the summary are that pure cultures of both the dysgonic and the eugonic colonies of human tubercle bacilli could be preserved for an unlimited period through any number of transplantations or animal passages, and the two variants had the same virulence for guinea pigs and rabbits as the standard human type, with no mutual differences. The bovine dissociants were in many cases mutually different in their growth, the dysgonic colonies being smooth, dome shaped and bright and the eugonic colonies irregular, finely wrinkled and dry. Rough eugonic Petroff medium colonies contained fewer viable bacilli than dysgonic colonies, a fact which must be considered when appraising virulence. An acid Löwenstein medium stimulates the formation of eugonic secondary colonies (R forms), as stated by previous investigators. The factor inciting this was not determined. It cannot be said that it is merely caused by adaptation to glycerin or by increased resistance acquired through lysis. The dissociations always took place in the direction from dysgonic to eugonic forms (S, smooth, to R, rough). The bearing of dissociation on the relationship between the human and the bovine type is debated, but so far no transformation in vitro of a bovine to a human type has been demonstrated. Repetition of Petroff's experiment on forced dissociation of BCG by means of cultivation on Sauton with rabbit immune serum proved to be negative, no change being found in the mode of growth or the virulence of the BCG strain. Reservation is being taken in respect to Petroff's claim of having demonstrated virulent forms of BCG cultures; nevertheless, though practically minimal, the possibility is entertained theoretically since BCG-like variants were found to arise from typical dysgonic bovine strains, and avirulent eugonic variants actually regained their virulence by animal passages. The dissociation of H 37 was substantiated, however, only on the assumption that H 37 was originally bovine and not of human type (which is contrary to all the published data on H 37).

The monograph is well worth reading, especially for its rounding out of a subject which still requires further solution and possibly to be attacked by more exacting and conclusive methods. It may possibly resolve itself when dissociation as a

whole is more fully understood. This has happened before in tuberculosis with the acquisition of additional knowledge, after which a few well planned experiments have been able to settle a problem. However, since the specialist and investigator must be aware of the problems involved in the present interpretation of tuberculosis, this volume should be accepted heartily by those wishing to be conversant with the subject of the dissociation of tubercle bacilli and how this affects the status of BCG today. It is presented in good form and in a clear, well written English. The cost is nominal.

Medical Jurisprudence and Toxicology. By William D. McNally, A.B., M.D., Assistant Professor of Medicine and Lecturer in Toxicology, Rush Medical College, University of Chicago, Chicago. Cloth. Price, \$3.75. Pp. 386, with 23 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

The purpose of this book, as stated in the preface, is to provide medical, pharmaceutical and dental students with a textbook covering the essentials of toxicology and also to furnish physicians with information concerning medicolegal testimony. Seven eighths of the book is composed of material on poisoning, blood, semen and hairs, all of which has been abridged from the author's larger work on toxicology published in 1937; 263 pages of this section is devoted to a discussion of poisoning in its various forms: homicidal, suicidal, accidental and industrial. Major emphasis is placed on clinical aspects such as methods of diagnosis and adequate treatment of various poisonings. One eighth of the book represents newly written chapters on courts, sudden or violent death, firearms identification and insanity. The treatment of these phases is rather superficial.

Although modestly concealed by the author, drama stalks throughout the pages of the book. Drawing on his wide court experience as expert toxicologist in *causes célèbres* of the past quarter century, the author regales his reader with accounts of mass murder by arsenic for the purpose of collecting insurance (p. 169), the application of geometry as well as chemistry in exposing a "framed" cyanide murder (Orpet case, p. 267), the attempted murder of an archbishop, his friends and associates by putting poison in the soup served at a banquet in the prelate's honor (p. 171), and even the detection of hydrocyanic acid in the blood of one of the victims of the Cleveland Clinic disaster (p. 266).

Apparently the process of condensing from the older and more voluminous text was conducted largely by the "scissors and paste-pot" method. Paragraphs and pages were lifted from the older book with the result that in this volume transitions are oftentimes abrupt, owing to the elimination of intervening material. Unfortunately this material was largely copied verbatim, including mistakes and typographic errors, so that a student who attempts to follow up the author's references will be required to do some careful detective work. The literature of toxicology has become so extensive that it is impossible to cover the entire field in any moderate sized volume. For this reason the author may be pardoned for the many omissions. While this book is a fairly satisfactory elementary textbook, it is unfortunate that the author and publisher did not use greater care in providing a more accurate and reliable work for student and reference use.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie. Par MM. P. Baillart, Ch. Coutela, E. Redslob, E. Velter. René Onfray: Secrétaire général. Tome II: Physiologie, techniques d'examen. Par MM. P. Baillart et al. Cloth. Pp. 1,144, with illustrations. Paris: Masson & Cie, 1939.

This is the second volume of the new eight volume encyclopedia of ophthalmology that is being produced under the auspices of the French Society of Ophthalmology. It is divided into two parts, physiology and technic, with the following subdivisions: the protective apparatus of the eye, by Magitot and Rossano of Paris; sensibility of the eyeball, by Cerise and Thurol of Paris; nutrition and circulation of the eye, by Baillart of Paris; conjunctival circulation, by Rollin of Paris; endocular fluids and nutrition, by Magitot of Paris; ocular tension by Magitot; physiology of extrinsic ocular motility, by Nordman of Strasbourg; intrinsic musculature, by Magitot; theoretical and applied optics, by Haas of Paris; physiologic optics, by Joseph of Paris; biologic optics, by Léplat of Liège; entopic phenomena by Viallefond of Montpellier; changes in the retina under the influence of light, by Magitot; physiology of vision,

by Piéron of the Collège de France, and binocular and spatial vision, by Opín of Toulon. The chapters on the technic of examination are shorter and divided in the following manner: methods of examination of the living eye, by Lemoine and Valois of Never; optotypes, by Lemoine and Valois; trial cases, by Joseph of Paris; instruments for the measurement of refraction, by Haas of Paris; skiascopy, by Joseph of Paris; perimetry, by Dubois-Poulsen of Paris; tonometry, by Dubar of Paris; ophthalmodynamometry, by Rollin of Paris; methods of photography of the eye, by Mawas of Paris; radiology and radiography, by Hartmann of Paris; methods of localization of intra-ocular foreign bodies, by Dollfus of Paris, and electromagnets and sideroscopes, by Veil of Paris. The chapters are not of as uniform caliber as are those of the first volume. Some, particularly those of Magitot and Baillart, are brilliant but tend slightly toward the expression of personal opinion, whereas others are somewhat skimpy, especially the one on biomicroscopy. Isn't it interesting to see that term, coined by our own Edward Jackson, coming into such universal use? Striking is the lack of chauvinistic attitude throughout the chapters, for the bibliographies are international in character and full credit is given, regardless of differences in international politics. This is refreshing in contrast to the regimentative attitude that prevails elsewhere on the continent. The mechanical aspect of the volume is good and the majority of the illustrations are excellent. Particularly good are some of the color plates. After the second volume has been digested, the feeling still remains that this is a "must have" work.

A Textbook of Obstetrics with Special Reference to Nursing Care. By Charles B. Reed, M.D., F.A.C.S., Associate Professor of Obstetrics, Northwestern University Medical School, Chicago, and Bess I. Cooley, R.N., Supervisor and Instructor, Department of Obstetrics, Wesley Memorial Hospital, Chicago. Cloth. Price, \$3. Pp. 476, with 209 illustrations. St. Louis: C. V. Mosby Company, 1939.

The authors are a physician of many years' experience and a competent supervisor of nurses at an excellent hospital. There has been a tendency for textbooks on nursing gradually to broaden their subject matter until the content pertains more to the practice of medicine than to that of nursing. This book goes further in that direction than most. It contains several excellent chapters, particularly on anatomy and physiology. There is a good chapter on anesthesia and analgesia, and a good chapter on normal labor.

The arrangement is not always orderly; for example, the chapter on antepartum care digresses to give a description of aseptic technic to be observed during the birth of the child. This is undesirable and entirely out of place. There are a number of statistical facts, for example those of multiple pregnancy and those on intra-uterine mensuration of the fetus, which contain facts and formulas that could not be of value to the nurse. A paragraph concerning the thyroid gland states that, "in one series, 60 per cent of pregnant women were aborted because of glandular hypertrophy." No reference is given nor are there any references in the book. This statement on the thyroid gland would tend to give the student nurse an entirely erroneous conception concerning thyroid disease complicating pregnancy.

The chapter on toxemias might lead the nurse to infer that certain methods of treatment are mandatory rather than methods available to the physician. There is a statement about eclampsia but no discussion of preeclamptic toxemia. The chapter is poorly arranged. There is also the following statement concerning the treatment of eclampsia, which is not subscribed to by most obstetricians at the present time: "If the woman is in labor, the process should be hurried as much as possible by forceps or by version and extraction. If not in labor, the uterine activity can be induced by the bag, bougie, or possibly in an emergency by cesarean section under gas anesthesia."

In one chapter there is given a list of eight types of pain in ectopic pregnancy which, it is said, the nurse should know about. This might be confusing even to the trained obstetrician. Two of these types of pain could be elicited only by pelvic examination.

The authors write easily about the signs of vitamin E deficiency and the value of vitamin E for bleeding during pregnancy. While vitamin E appears to be of value in the prevention of spontaneous abortion, its description in this connection would be confusing to the student nurse.

The book contains descriptions of several methods which appear to be entirely obsolete and some of which are considered to be dangerous; for example, resuscitation of the asphyxiated baby by means of Byrd's method of manipulation.

In connection with the advice concerning intravenous transfusion, a description of the technic for cutting down on, and ligation of, the vein is given. This is a procedure which is almost obsolete, and yet there is nothing in the description to indicate that this is so. A description of the Walcher position is interposed between paragraphs on curettage for incomplete abortion and paragraphs on artificial interruption of pregnancy. A statement is made concerning artificial rupture of the membranes at term for placenta praevia centralis. Surely the authors must have had in mind placenta praevia partialis or marginalis. There is a description of the induction of labor by four doses of from 5 to 10 grains of quinine sulfate. It is suggested that the patients may be given a drachm of 1:80 dilution of chemically pure sulfuric acid in a glass of water for each 5 grains of quinine. Treatment which is rarely employed is out of place in a book on obstetrics for nurses. A description is given of the use of laminaria tents for the interruption of pregnancy. This method of induction of labor is not surely aseptic and there is no reason to include this in a textbook on obstetrics or on nursing. There are a number of excellent outlines for the setup of the operating rooms for various obstetric procedures which should be of considerable value to the graduate nurse, and particularly to one who is instructing nurses in obstetric procedures.

This book would have been of greater value if it had been published in condensed form as a handbook of the nursing technic of obstetric procedures.

Psychischer Befund und psychiatrische Diagnose. Von Professor Kurt Schneider, Direktor des Klinischen Instituts der Deutschen Forschungsanstalt für Psychiatrie (Kaiser Wilhelm-Institut) in München. Paper. Price, 1.40 marks. Pp. 27. Leipzig: Georg Thieme, 1939.

This is devoted to a discussion of symptoms and their evaluation in psychiatric diagnosis. It is intended primarily for practitioners. The subject is introduced with a suggestion that disturbances in the individual functions be sought for and interpreted and, from these symptoms, a diagnosis be built. The more frequent psychoses, schizophrenia and cyclothymia, and the demarcation of these psychoses from neuroses, psychopathic personality and toxic and organic cerebral conditions are stressed. Disorders of perception, of thought and mood and of will and instincts are considered. Symptoms are then grouped into those which are significant for a diagnosis of schizophrenia and those which are more general and can be utilized as diagnostic aids only against the background of the total clinical picture. Interspersed are warnings against pitfalls in the interpretation of symptoms and cautions as to common sources of errors. This all too brief monograph is a concentrate of an extensive psychiatric experience. A study of its pages will reward the prepared reader, yet one questions its usefulness for the general practitioner. The average physician, allergic to psychiatric phraseology, may find this condensed presentation, the delicate distinctions of ideas and categories and the terminology too formidable for ready usage.

Lungenabszess und Lungenabszedierungen im Kindesalter. Von Dr. med. Sotirios Roufogalis. Mit einem Geleitwort von Prof. Dr. med. F. Goebel, Direktor der Kinderklinik der Medizin. Akademie, Düsseldorf. Paper. Price, 16.50 marks. Pp. 166, with 37 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

Pulmonary abscess in the opinion of Professor Goebel, who writes the introduction, has received little attention in the pediatric literature (German), which he notes is in marked contrast to the extensive consideration given the subject in the literature of surgery and internal medicine, and this literature is concerned largely with the disease as seen in the adult. The generally accepted causes of pulmonary abscess are considered impartially; in fact all through the monograph the author presents data and elaborates their bearings on the problems, with no attempt at emphasizing his own point of view, which is that of a pediatrician. Tonsillectomy is noted as a rather frequent cause of pulmonary abscess, though at one time it was thought to be a rare or, in Germany, a nonexistent etiologic factor in this disease. Diagnosis is chiefly by the x-rays, though the physical signs are clearly and carefully stated. In treatment

the author is conservative as to radical operation. He states that, whereas formerly preference was given to surgical intervention, today operation is seldom advised unless empyema is present. (The monograph concerns children only.) Though strongly conservative on the question of surgical intervention, the author feels that there are cases in which external operation should not be postponed, especially in older children. He regards it as extremely difficult to lay down rules as to the time to operate as well as to determine the right time in any particular case. In most cases the best results have come from general treatment by the pediatrician. He speaks well of bronchoscopic aspiration, but he has had limited opportunity for observing its effect in his own cases. The younger the child the worse the prognosis of pulmonary abscess, according to his experience. The illustrations are all reproductions of roentgenograms; they are well chosen and show clearly what they are intended to show. The statements are well documented by references and case reports. The general excellence of the book and the wealth of detail would justify a good index for ready reference. In common with similar monographs, this one has only a table of contents.

The Licensing of Professions in West Virginia. By Frances Priscilla De Lancy, Instructor in Political Science, West Virginia University, Morgantown, West Virginia. A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in the Graduate School of Arts and Sciences of Duke University. Cloth. Price, \$2.25. Pp. 197. Chicago, Illinois: Foundation Press, Inc., 1938.

Much has been said concerning the defects of our various systems of professional licensure, but little has been written about the fundamental principles or social theories on which such regulation must rest. In her doctoral thesis Miss De Lancy has analyzed the professional laws of West Virginia and summarized their history. For the purpose of her study she has formulated a definition of the term profession both interesting and unique, namely "that organized vocation in which individuals are licensed by the state after a period of formal academic education and training in an approved professional school." So restricted, the term excludes such long recognized professions as the ministry, journalism, teaching and the stage because they are not licensed by the state. It also ignores such newer aspirants to professional recognition as plumbers, realtors and barbers on the ground that for them no formal education is deemed necessary. In her discussion of the administration of licenses the author has shown unusual discrimination in the appraisal of the functions of professional associations. Unfortunately it is erroneously stated that Negro physicians are not admitted to membership in the American Medical Association. Altogether the book is stimulating and informative. An excellent bibliography enhances its value.

Schilddrüse, Jod und Kropf: Klinische und experimentelle Untersuchungen. Von Max Saegesser. Helvetica medica acta, Supplementum IV, 1939. Paper. Price, 10 Swiss francs. Pp. 163, with 20 illustrations. Basel: Benno Schwabe & Co., 1939.

According to the conclusion on page 162, the purpose of this book is goiter prophylaxis. With two exceptions (and two translations) only German literature is quoted. On page 94 the analyses on one sample of blood are given, in micrograms per hundred cubic centimeters (γ%), as from 8.2 to 69.2. With 750 per cent error it is rather difficult to understand how small differences in the results of iodine analysis can be used for theoretical work. Furthermore, there is a peculiar method of using the analyses. The micrograms per hundred grams (γ%) in thyroid, heart, lung, liver, kidney, muscle, brain, spleen and skin of a rat are added together and the total is found to be from 1,677 to 8,894 micrograms in the different experiments, and yet in one case the thyroid is said to contain only 721 micrograms. Just what these figures mean it is impossible from reading the entire book to determine, since the weight of no organs is given, and yet on the basis of these experiments the exact rates of iodine anabolism and catabolism are estimated. The alcohol-insoluble iodine in the blood is stated to be almost entirely in the corpuscles and it is concluded that this iodine in the corpuscles is what passes out in the urine, although in another place it is stated that the process of iodine catabolism has to be gone through with in order to make this iodine alcohol soluble. On page 101 it is stated that simply raying the skin with ultraviolet causes an increase in the iodine content of the

rat and that the additional iodine must have been absorbed through the skin and lungs (presumably from ordinary air), but the values which von Fellenberg has given for the iodine content of air would make the increases noted impossible during the time of the experiment; i. e. the rate increased from 4,718-4,767 to 8,774-8,894 micrograms in four days. Wheat grains were raised in one hour of ultraviolet irradiation from 7 to 16 micrograms, and the author says this is in harmony with von Fellenberg's observation that the flora has more iodine in the summer! On page 145 are given data on five cretins in whom thyroids had been implanted. To use this procedure seems a pity, since it is well known that thyroid administered by mouth or subcutaneously can be very much better controlled than thyroid grafts, which will not grow.

Symptoms and Signs in Clinical Medicine: An Introduction to Medical Diagnosis. By E. Noble Chamberlain, M.D., M.Sc., F.R.C.P., Physician to Out-Patients, Royal Liverpool United Hospital, Royal Infirmary Branch, Liverpool. With a chapter on The Examination of Sick Children. By Norman B. Capon, M.D., F.R.C.P., Lecturer in Diseases of Children, University of Liverpool, Liverpool. Second edition. Cloth. Price, \$8. Pp. 435, with 318 illustrations. Baltimore: William Wood & Company, 1938.

This edition is essentially the same as the first, and it must be remembered that physical diagnosis is a static rather than a dynamic science. There is, however, a change which adds to the satisfactory arrangement of the book, namely the collection into two chapters of all the laboratory data which had been scattered throughout the volume. There has also been added a table of biochemical standards. The book consists of thirteen chapters. The first two are more or less general and include the history taking, the physical examination and the external characteristics of disease. The next seven are devoted to important body systems, with two chapters on the nervous system. Succeeding these is a chapter on fever, another on examination of sick children and the two on laboratory data. As far as physical diagnosis is concerned, the chief objection to the book is the slight space devoted to important procedures in physical examination. Thus, percussion of the lungs is dealt with in what is equivalent to about two pages when four illustrations are deleted; incidentally, two of these, figures 77 and 78, are excellent, whereas figures 79 and 80 seem to be redundant. About the same amount of space is devoted to percussion of the heart. Auscultation is likewise dealt with rather briefly, as are other methods of physical examination which require the use of the four senses. To one of the senses is allowed a considerable amount of space; not only are a good many words written about the division of physical diagnosis which has to do with inspection, but also there are innumerable and excellent illustrations to explain the written contents. In addition to many photographs there are several colored plates and a few diagrams. The book can be recommended for the beginner in medicine. It is reasonably complete and deals largely with elementary essentials in the diagnosis of disease.

Über die integrative Natur der normalen Harnbildung. Von Gösta Ekehorn, D. R. med. Telle I, II und III. Paper. Pp. 616; 619-1137; 1139-1431. Helsingfors: Mercators Tryckeri, 1938.

This wordy treatise is written by a native of Sweden in German and published in Finland; the first sentence of the preface states that it is a continuation of the author's previous book "Principles of Renal Function," which was published in English. The author first assumes that the glomerular filtrate is an ultrafiltrate of the blood and that the kidney tubules are impermeable to creatinine and only slightly permeable to urea. He calls them "schlackenstoff" to distinguish them from "schwellenstoffe," or threshold substances, including salts and water. Later, however, he spends much space disproving the impermeability of the tubule for creatinine. He states that the glomerular capillary blood pressure may be so high as to equal half the normal systolic arterial pressure, and therefore the glomerular filtrate volume averages about one fourth the renal blood volume. On the assumption of impermeability to creatinine, he quotes tables from Rehberg's 1926 publication to show the amount of ultrafiltrate and the amount of absorption of salt, water and urea back into the blood. The author states that when the reabsorption of water decreases during diuresis the reabsorption of urea decreases and that therefore there is more water and urea in the urine. The glomerular filtrate, he says,

is about 125 times the volume of the urine. Therefore 124 volumes are reabsorbed. He accepts the opinion that the increase in the nonfiltrable constituent of the blood as it passes through the glomeruli controls the amount of reabsorption of salt in the convoluted tubules of the first order. The book might be said to end with the pointing out of many unsolved problems in kidney physiology and of analogies between these problems and problems connected with the secretion of gastric juice.

Nursing Mental Diseases. By Harriet Bailey, R.N. Fourth edition. Fabrikold. Price, \$2.50. Pp. 264. New York: Macmillan Company, 1932.

This is a concise, practical, informative and interesting textbook for the instruction of nurses in the understanding and management of psychiatric patients. The early chapters deal with the history of the care of the mentally sick and with legal aspects of mental disorders, followed by a general discussion of personality development, causes and classification of mental disorders, symptoms and special nursing measures required in the care of psychotic patients. Especially commendable is the chapter detailing such nursing procedures as the administration of food, relief of insomnia, prevention and treatment of bed sores, attention to evacuation of the bowels and bladder, the management of excited patients and precautions against suicide, which are so important and sometimes so difficult in the care of the mentally ill. Chapters VIII to XXI describe specific mental disorders and, in brief, the special nursing procedures requisite to each. Later chapters deal with methods of treatment such as occupational, recreational and physical therapy, which in hospitals are usually under the supervision of specially trained workers but which the nurse may be called on, especially in private practice, to direct. In conclusion there is a valuable discussion of measures for the prevention of mental illness and the promotion of mental health, and finally an excellent bibliography of suggested supplementary reading, including not only didactic but also popular writings on the subject of mental illness such, for example, as Shakespeare's *King Lear* and *Timon of Athens*.

Ker's Manual of Fevers. Revised by Frank L. Ker, B.A., M.B., Ch.B., Senior Assistant and Deputy Medical Superintendent, Little Brownhill Hospital, Birmingham, England. Fourth edition. Cloth. Price, \$1.50. Pp. 354, with 15 illustrations. New York & London: Oxford University Press, 1939.

In the preface of this edition the son of the original author has expressed his desire to adhere to the aims of his father. As a consequence revisions in the text consist chiefly of slight changes or additions made necessary because of advanced knowledge, particularly with respect to treatment, including chemotherapy. To any one familiar with the subjects discussed, the contents of the book should be refreshing. It is readily apparent that the clear and complete descriptions of the various contagious diseases as presented by Claude B. Ker are the result of keen observation, careful thought and extensive experience. There are few technicalities but much information that is sound and practical. The volume is likely to receive its greatest appreciation from those who have had training in contagious disease hospitals. To the medical student the chapters on smallpox and typhoid should be of special interest. The six plates, though not in color, are all good, particularly the ones illustrative of smallpox. A table of infectious diseases at the close of the volume will be valued by the student.

Bericht über den VIII. Internationalen Kongress für Unfallmedizin und Berufskrankheiten Frankfurt a. M. 26. bis 30. September 1938. Unter der Schirmherrschaft des Herrn Reichsarbeitsministers Franz Seldt. Bänden I und II. Paper. Price, 50 marks per set. Pp. 322; 323-1577, with 145 illustrations. Leipzig: Georg Thieme, 1939.

This report contains the proceedings and papers of the eighth International Congress for Industrial Medicine and Occupational Diseases, held in Frankfurt on the Main in 1938. The large number of papers presented by European workers affords the American reader an excellent opportunity to gain insight into their practices and experiences. Although most of the papers are in German, French or Italian, many of the longer ones are provided with excellent English summaries. Volume I contains a joint discussion, by the two sections of the congress, of pre-disposition and wear and tear in their relation to industrial

accidents and occupational diseases. Such subjects as the relation of the condition of the body to the effect of injuries, cutaneous conditions as a factor in occupational injuries and neurologic and genetic aspects indicate the extent to which this topic is discussed. In one paper special attention is given to the problem in the so-called mass production industries. Volume II, the larger of the volumes, contains the papers of the section on industrial surgery and those of the section on occupational diseases. The industrial surgeons confined their discussions to two topics: (1) injury to the peripheral nerves with the exception of the sympathetic system and (2) injuries to the foot. The cause, nature and modes of treatment of these injuries are discussed thoroughly and at length by many world authorities. The section on occupational diseases provides papers on scores of topics, including hydrocarbon solvents, manganese pneumonia, occupational cancer, silicosis, asbestosis, carbon bisulfide and chlorinated hydrocarbons, chiefly trichlorethylene. It appears from the proceedings of this international body that the problems relative to occupational diseases are at this time essentially the same for all the industrial countries of the world.

Gynaecology. By Herbert H. Schlink, Lecturer and Examiner in Gynaecology, University of Sydney, Sydney. Cloth. Price, 32s. 6d. Pp. 557, with 181 illustrations. Sydney & London: Angus & Robertson, Limited, 1939.

This was designed as a textbook for students at the University of Sydney and as such is an admirably prepared volume. Particularly well done are the chapters on anatomy and physiology and the chapters dealing with prolapse and displacement of the female generative organs. The chapters on history taking and methods of examination are at the end of the book, subjects which it appears should be taken up at the outset in a study of any specialty. The chapters on operative gynecology, postoperative complications and treatment and the descriptions and designations accompanying the illustrations are incomplete and even confusing at times, while the author is much too dogmatic in expressions relative to the choice of operation, particularly with regard to the treatment of retroversion by round ligament shortening. This may, as stated previously, be an excellent textbook for use by Schlink's students at Sydney. In view of the already published and most excellent textbooks of gynecology available, this book adds nothing of value for the American practitioner or student.

Problems in Prison Psychiatry. By J. G. Wilson, M.D., Director, Division of Hospitals and Mental Hygiene, Department of Welfare of the State of Kentucky, and M. J. Pescor, M.D., Clinical Director, United States Public Health Service Hospital, Fort Worth, Texas. Cloth. Price, \$3. Pp. 275. Caldwell, Idaho: Caxton Printers, Ltd., 1939.

This is an extremely interesting pioneer work directed toward understanding the mental problems of criminals. The authors have worked with many prisoners and attempt an understanding of the cause, therapy and prevention of neurotic and psychiatric crimes. The work should be studied by prison administrators as well as physicians having to do with prisons. It is a sound psychiatric study and is the best of its kind so far attempted.

Radiologie clinique du cœur et des gros vaisseaux. Par Ch. Laubry, P. Cottenot, D. Routier et R. Helm de Balsa. Fascicules I et II. Cloth. Price, 430 francs. Pp. 163; 164-340, with 1,049 illustrations. Paris: Masson & Cie, 1939.

There are three parts to the monograph. The first is concerned with the utility of x-ray examination of the cardiovascular system and the various technics by which this method may be applied to such examination. The second part is concerned with the appearance of the normal heart in all its variations and the factors at work in the production of such normal differences. The third part is concerned with organic heart disease and considers rheumatic, congenital, syphilitic, chronic myocarditic, hypertensive and pulmonary heart disease in the order named. Then the pericardial involvements and the picture produced by heart failure follows. The appearance produced by extracardiac mediastinal masses is finally considered. The bibliography is extensive. This two volume work on cardiovascular roentgenology is highly recommended. It is beautifully and completely illustrated and the terse discussion is quite adequate. The x-ray delineation of the right and left sides of the heart separately in the cadaver by means of barium sulfate injections is illuminating.

Regeneration: ihre Anwendung in der Chirurgie. Mit Einem Anhang: Operationslehre. Von Dr. Johann v. Ertl. Paper. Price, 24 marks. Pp. 246, with 388 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

This book reports the principles used and the results obtained in the care of about 60,000 patients with war injuries. It is purposely written twenty years later in order to give the late results. It is a general treatise on the theory behind the work done rather than a statistical survey. The late results are shown by numerous reproductions of photographs and x-ray plates. There is a short incomplete historical sketch, followed by a general discussion of the regeneration and transplantation of the various tissues, but little of which is the author's original work. The principle of repair of tissue defects in layers is stressed repeatedly, as are the biologic conditions of successful transplantation of tissues in general. These are well accepted concepts. The author makes frequent use of thin flexible bone grafts, so-called osteogenic grafts, and reports excellent results. A small number of small bone chips are removed attached to the periosteum in preparing this type of graft. It is used as an onlay graft or doubled back on itself in replacing bone defects, as in the lower jaw. The book could be more detailed in describing technical procedures. The illustrations and sketches cannot be compared as to quality with those of older German writings.

The Mechanism of Thought, imagery and Hallucination. By Joshua Rosett, Professor of Neurology in Columbia University, New York. Cloth. Price, \$3. Pp. 289, with 12 illustrations. New York, Morningside Heights: Columbia University Press, 1939.

A tremendous amount of effort has been put into this great tome in an effort to explain the mechanisms of mental processes on a strictly organic basis. Biologic data and the experiments with diseases affecting man are utilized in deducing the mechanisms of thought. Each chapter outlines a phase of the subject and is followed by a detailed summary and bibliography. Thought, imagery and hallucination are discussed and described, but the explanations are not satisfactory even though based on physiology. We still appreciate Sherrington's statement that understanding the physiology of the brain leads us but little closer to understanding mental processes.

Troubles du myocarde dans les anémies: Etude clinique, expérimentale et pathogénique de l'insuffisance nutritive d'origine sanguine. Par le Docteur Charles Bauge. Paper. Pp. 124, with 9 illustrations. Paris: Librairie E. Le François, 1939.

This monograph, based on analysis of six case reports and seventeen animal experiments correlated with a thorough review of the literature, deals with the effect of acute hemorrhagic anemia and chronic progressive anemia on the heart. The author properly points out that the effect of anemia on the heart constitutes an important part of the clinical picture. As a result of his analyses the author states that gallop rhythm, an increase in the magnitude of the heart activity fluoroscopically, the presence of heart murmurs and low voltage and low T waves constitute the elements in chronic anemia. Occasionally, coronary electrocardiographic changes are present. This is more prevalent in the acute form. The circulatory changes are due as much to the changes in circulatory blood volume and composition of the plasma in the acute form as to the loss of hemoglobin. Transfusion is considered the most important method of treatment. The monograph will repay the cardiologist for perusing it. Perhaps the assembly of data dealing with this subject will inspire further investigation of this all important subject.

How to Psychoanalyze the Bible. By H. F. Haas. Cloth. Price, \$1. Pp. 116. Orangeburg, S. C.: Haas Publication Committee, Publishers, 1939.

The author of this book, apparently a layman who bears the same name as the publishers, attempts to expound a rationalistic attitude toward Christianity and the Bible. He exhorts the reader to adopt the methods of reason and science and to free himself from the influence of the superstitions and fears which have been distorting the true meaning and value of Christ's teaching. Much use is made of such terms as "psychoanalysis," "unconscious" and "repression," but in such a way as to make obvious that the author has no knowledge of their true meaning. The book can in no way be recommended as a serious psychological study of the Bible.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Appendicitis Allegedly Resulting from Trauma.—Keahey fell in the course of his employment, Dec. 5, 1932, injuring his back and hip, and was paid compensation under the Texas workmen's compensation act. On March 21, 1933, he underwent an appendectomy. July 3, 1935, more than two years later, he underwent an operation for the relief of intestinal strangulation caused by adhesions which had developed following the appendectomy. He died the following day. His widow and children claimed compensation under the Texas compensation act, attributing death to the original industrial accident, but the industrial accident board rejected their claim. They then instituted proceedings before the district court, Wheeler County, Texas, which rendered judgment on a verdict of the jury in their favor, and the employer's insurer appealed to the court of civil appeals, Texas, Amarillo.

The workmen's compensation act, said the court of appeals, provides compensation for injuries arising out of and in the course of employment. The term "injury" is limited by the act to mean "damage or harm to the physical structure of the body and such diseases or infection as naturally result therefrom." It follows, then, that injury or death resulting from intervening, independent agencies is not compensable. Thus, if by reason of an industrial injury a workman's resistance against diseases and infections coming from other sources is reduced and he contracts and dies from those diseases and infections, his death is not compensable. *Texas Employers' Ins. Ass'n v. Burnett*, 105 S. W. (2d) 200.

To prove that the intestinal adhesions and the surgical operation performed on the workman July 3, 1935, to remove them were the ultimate result of the industrial injury of Dec. 5, 1932, the claimants called Dr. York, who had treated the workman in March 1935 shortly before the last operation but had not seen the workman prior to that time. Dr. York first testified that he thought the injury contributed to the disease condition of the appendix. Later he stated that in his opinion the injury caused the appendicitis but said he "couldn't just qualify on that." Still later he testified that in his belief the injury caused the appendicitis. On cross-examination he stated that he could not say "just exactly that the injury was the sole cause, but it was a highly contributing cause," because he believed that inflammation resulted from the industrial accident and, by a process of contiguity, progressed through the muscles, organs and tissues of the body from the locus of the injuries through the psoas and other muscles in the lumbar region and through the peritoneum and finally reached and involved the appendix, necessitating the appendectomy on March 21, 1933.

The value of Dr. York's testimony, said the court, depends on whether or not there was present in the region of the appendix or in the appendix itself, when the appendectomy was performed in March 1933, inflammation or infection which had originated at the locus of the injuries to the workman's back three and a half months prior thereto and whether or not such inflammation or infection caused the appendicitis. The testimony of the physician who had performed the appendectomy in question and the nurse who had assisted him was quite clear that at the time that the appendectomy was performed there was no inflammation of the tissues surrounding the appendix or bowels or any part of the abdominal cavity except the appendix itself, nor was there any black, blue or bruised spot on the patient's back or elsewhere on the body and that the workman "was suffering from an ordinary case of appendicitis." That physician further stated that the conditions which, in the opinion of Dr. York, existed in the region of the appendix and brought about its disease condition and necessitated the appendectomy did not exist. This physician further testified that he had never known or heard of a case of appendicitis resulting from a bruised back or hip and that he had never read any medical authority which reported such a case. He stated that,

if the appendix had been affected by inflammation proceeding from the injuries in the patient's back, the organs and tissues in the region of the appendix and between the appendix and the locus of the injuries would have shown an inflamed or infected condition, but that he found no evidence of any inflammation or infection of any organs or tissues except the appendix. He stated that if such inflammation or infection could be so communicated it would have to go through the heavy lumbar muscles which form the back side of the body wall and then through the psoas muscle, both of which are very thick, and then it would have to proceed through the bony pelvis or ilium and the back bone and then the kidneys and other tissues in that region, and that inflammation from a bruise could not proceed through such tissues, muscles and portions of the body so as to cause appendicitis. If such a thing were possible, he said, the injury would have to be so tremendous that the patient would be dead before the results could be transmitted through such heavy structures as intervene between the back and the appendix. In his opinion there could be no possible connection between a back injury and the development of appendicitis, especially after so long an interval.

In the opinion of the court, Dr. York's testimony merely raised a surmise or suspicion that the attack of appendicitis may have been the result of the injuries to which the workman was subjected three and one-half months prior to the attack of appendicitis and did not warrant the trial court submitting the case to the jury. If, said the court, there was any connection between the original injury and the appendicitis, there must have been present, in the region of the appendix at the time that operation was performed, inflammation or infection that had its origin in the injury to the workman's back, and the existence of this condition is the very basis of Dr. York's opinion. The testimony of the operating physician and his nurse, however, leaves no room for doubt that the appendical region at the time the appendectomy was performed was, as a matter of fact, free from any such infection or inflammation and thus destroys the theory and opinion of Dr. York. The trial court should have instructed a verdict in favor of the insurance company.

The court of civil appeals accordingly reversed the judgment in favor of the widow and the children.—*Traders & General Ins. Co. v. Keahey (Texas)*, 119 S. W. (2d) 618.

Malpractice: Trench Mouth Diagnosed as Syphilis.

The plaintiff consulted the physician defendant, July 28, 1936, relative to sore mouth, throat and gums, informing him that she had had "trench mouth" about two years before. The physician, without resorting to a Wassermann test, which he told her was unnecessary, from a superficial examination of the mouth and gums made a diagnosis of syphilis in an advanced stage and instituted a course of bismuth and arsenic treatments. In about two weeks her eyes became inflamed and watery, and in about three weeks her feet, ankles, arms and legs began to swell. The treatments, however, were continued until September 13. She was hospitalized September 17, at which time she was semiconscious and had pimples all over her skin from which pus and water exuded. She remained in the hospital under the defendant's care for thirteen days with no apparent improvement and was then removed to another hospital and placed under the care of Dr. Turner, who made a diagnosis of exfoliative dermatitis (arsenical), Vincent's angina and pyalism or salivation. Eventually her hair fell out, she shed her finger and toe nails and she was affected with "lockjaw" to the extent that she could open her mouth but slightly and was unable to masticate her food. She brought suit against the defendant physician, who defended by contending that her injuries, if any, were due to an idiosyncrasy.

At the trial medical experts testified that it was not the accepted, standard or proper practice for a physician to attempt a diagnosis of syphilis without a Wassermann test, a microscopic test or a blood smear. With respect to the propriety of the defendant's continuing to administer arsenic and bismuth in the presence of inflammation of the patient's eyes, the swelling of her limbs and her entire body and the dermatitis, there was medical evidence that when symptoms of arsenic poisoning are present in a patient undergoing the therapy in question, the proper course is immediately to discontinue the treatment and

give the patient something to counteract the ill effects of the treatment. There was further medical testimony that subsequent to the defendant-physician's release from the case other physicians had made Wassermann blood tests of the patient, that none of these physicians had made a diagnosis of syphilis and that none of these physicians had treated her with arsenic or bismuth. At the close of the plaintiff's case, the trial court directed a verdict in favor of the physician-defendant and the patient appealed to the court of civil appeals of Texas, Amarillo.

The sole question to be determined by the appellate court concerned the right of the trial court under the testimony to direct a verdict in favor of the physician. While a physician, said the court of civil appeals, does not insure results, he is required to have such reasonable skill as the profession generally possesses and to exercise such skill with reasonable care and diligence. The physician here offered no testimony and the evidence adduced by the patient is undisputed that the physician informed the patient that he could make or have made a Wassermann test, that such a test or a microscopic blood test was in common use in the locality in which the defendant practiced and generally by the profession and was deemed by them essential in order to diagnose the disease of syphilis; and that the defendant made no such test but relied on the superficial examination of looking into and swabbing the mouth and throat, which was undependable and not relied on by the medical profession to determine the existence of such disease. The evidence raises fact issues as to a negligent diagnosis and as to whether the patient's damage resulted from the treatments of arsenic and bismuth administered by the defendant. The jury should have been permitted to determine these issues. The judgment in favor of the defendant-physician was accordingly reversed and the cause was remanded.—*Gifford v. Howell* (Texas), 119 S. W. 578.

Taxes: Antivivisection Activities as Charitable Activities.—For federal estate tax purposes, the Commissioner of Internal Revenue refused to allow as a deduction from the gross estate of a testator a legacy left to the New England Antivivisection Society, and the executor of the will sought a reversal of the commissioner's ruling in the United States district court, D. Massachusetts.

The federal estate tax law under which this case arose provided that for the purpose of taxation the value of the net estate shall be determined by deducting from the value of the gross estate:

The amount of all bequests, legacies, devises, or transfers . . . to or for the use of any corporation organized and operated exclusively for religious, charitable, scientific, literary, or educational purposes, including . . . the prevention of cruelty to children or animals, no part of the net earnings of which inures to the benefit of any private stockholder or individual . . .

The executor contended that the New England Anti-Vivisection Society is an organization organized and operated exclusively for charitable purposes within the meaning of the federal estate tax law.

The commonly understood and narrow meaning of the word "charity," the court said, is good will to the poor and suffering, almsgiving and provision for the care or relief of the poor (Webster's International Dictionary, ed. 2). In the law, however, a far broader and more comprehensive significance has been given to the word. The most generally accepted definition of it is found in the extensively cited case of *Ould v. Washington Hospital for Foundlings*, 95 U. S. 303, 24 L. Ed. 450, wherein it was said that "a charitable use, where neither law nor public policy forbids, may be applied to almost anything that tends to promote the well-doing and well-being of social man." It was clear to the court in the present case that what is done out of good will and a desire to add to the improvement of the moral, mental and physical welfare of the public generally comes within this meaning of the word "charity." The charter of the society provides that it was organized for the purpose of systematic, scientific research relative to the practice of vivisection—its relation to science and its effect on those who practice it and on society; exposing and opposing secret or painful experiments on living animals, lunatics, paupers or criminals; urging education and legislation in pursuance of these ends, and issuing posters, pamphlets and other publications. In the opinion

of the court, the aims and purposes of the organization were for the public good and were charitable within the meaning of the federal estate tax law.

The evidence disclosed that the society had sponsored several bills in the Massachusetts legislature asking that dogs be exempt from the practice of vivisection. The circumstances of the society favoring the passage of this legislation, the court said, did not in any way place the society outside the provisions of the federal estate tax law. This legislation was merely incidental to carrying out the purposes and accomplishing the purposes of the society. The help of the legislature was necessary to enable it to advance its aims. Such activity was, as expressed in the case of *Slee v. Commissioner of Internal Revenue*, 42 F. (2d) 184, 72 A. L. R. 400, "mediate to the primary purpose, . . . ancillary to the end in chief." This incidental activity, the court concluded, did not militate against the contention that the society was "exclusively" organized and operated for charitable purposes. The ruling of the Commissioner of Internal Revenue was therefore reversed.—*Old Colony Trust Co. v. Welch*, 25 F. Supp. 45.

Workmen's Compensation Acts: Refusal of Employee to Accept Medical Treatment Tendered by Employer.—

The workmen's compensation act of Indiana provides that during the first ninety days after an injury the employer "shall furnish or cause to be furnished, free of charge to the injured employee, an attending physician, for the treatment of his injuries, and in addition thereto such surgical, hospital and nurse's services and supplies as the attending physician or the industrial board deem necessary." The refusal of the employee to accept such services and supplies, when so provided by the employer, bars the employee from all compensation during the period of such refusal.

On Oct. 22, 1937, the claimant, Pipkin, as the result of his employment with the defendant corporation, sustained a right inguinal hernia. He consulted two "company doctors," furnished by the defendant, who advised against an operation because he did not have a "complete hernia." He also consulted two other physicians of his own choice who diagnosed his condition as a "complete hernia" and advised that he undergo an operation for its repair. On November 19 he requested the defendant to provide such an operation. This request was at first refused but later the defendant agreed to provide the services of one of its "company doctors" for such an operation. The claimant, however, refused to accept such services because he believed that the company doctor "did not know what was the matter with him." Instead, he submitted to an operation by a physician of his own choice. Later, he filed a claim with the industrial board of Indiana for compensation under the workmen's compensation act. The board, however, found that by his refusal to accept the medical services tendered by his employer he had forfeited his right to compensation. From an award of the board denying compensation, the claimant appealed to the appellate court of Indiana, in Banc.

The workmen's compensation act, said the appellate court, bars any employee from compensation who refuses to accept such surgical, hospital and nurse's services as the attending physician, who is furnished by the employer, or the industrial board may deem necessary. As was held in *Witte v. J. Winkler & Sons, Inc.*, 98 Ind. App. 466, 190 N. E. 72, the employee's refusal to accept such services does not bar his claim for compensation unless his refusal is unreasonable. Whether a refusal is or is not reasonable will depend on the facts of each particular case and is a question for the determination of the industrial board in its sound discretion. In the judgment of the court, the evidence did not show conclusively that the claimant's refusal to accept the company surgeon's services was reasonable. The qualification of the company surgeon and his ability to perform the operation were proved and undisputed. Lack of confidence in the physician, which was the claimant's sole reason for refusing to accept his services, was not a sufficient reason. If it were held to be so, it would in effect be holding that the employer must furnish a surgeon satisfactory to the employee, whereas the workmen's compensation act does not give the employee the privilege of choosing his own physician. Accordingly, the appellate court affirmed the award of the industrial board denying compensation.

Judge Laymon, in a special dissenting opinion, disagreed with the opinion of the majority of the court. In his opinion, the mere fact that an employee desires to submit to the services of a physician of his own choosing, and, by reason of that fact alone, all other facts being equal, refuses the same services proffered by his employer, does not of itself make such a refusal unreasonable. It would indeed be a harsh rule that bound an employee to submit to a surgical operation, where life and death are at stake, and to accept the services of a physician who advised against the operation, after diagnosing the case and consulting the patient, simply because the physician is being furnished by the employer. The dissenting justice relied for his opinion on the case of *Witte v. J. Winkler & Sons, Inc.*, supra, in which the court said:

The question of whether an employee is justified in refusing to submit to a surgical operation proffered by his employer is one that has to do largely with the personal element. It is the employee upon whom the operation has to be performed, and his rights and interests should be seriously considered.

—*Pipkin v. Continental Steel Corporation (Ind.)*, 16 N. E. (2d) 984.

Foods: Liability of Packer and Retailer for Trichinosis.—One of the defendants, a packer of meats, sold smoked pork infested with parasites known as trichinae to another defendant, a retailer of meats. The defendant retailer ground or chopped up the pork and without cooking it made it into a sausage, which he smoked for about a week. The plaintiff purchased some of the sausage from the defendant retailer and subsequent to eating it developed trichinosis. He attributed the disease to the sausage and brought suit against both the packer and the retailer in the court of common pleas, alleging that the smoked pork and the sausage were unwholesome, adulterated, diseased and infected. From a judgment of the court of appeals, Lucas County, affirming the judgment of the court of common pleas in favor of the plaintiff, the defendants appealed to the Supreme Court of Ohio.

The defendants contended, among other things, that the plaintiff was negligent in eating the sausage without cooking it. They pointed out that there was no practical method of inspecting pork for the presence of trichinae and that if the laws of Ohio impose an absolute liability on them for the sale of pork infested with trichinae such laws violate the constitutions of the United States and of Ohio. But, said the Supreme Court, a manufacturer or packer of food warrants to the public generally that the food produced by it is fit for human consumption and it is liable for a breach of that warranty. In the instant case, the liability of the packer was primary and that of the retailer was secondary. Their liability was separate, not joint, and the packer and retailer should not have been sued jointly. Because of the misjoinder of the parties defendant, the Ohio Supreme Court reversed the judgment in favor of the plaintiff and remanded the cause for action in accordance with the court's mandate.—*Kniess v. Armour & Co. (Ohio)*, 17 N. E. (2d) 734.

Workmen's Compensation Acts: Hemorrhoids in Relation to Strain.—The claimant, Nantron, in the course of his employment with the defendant company, slipped while moving a "terrazzo machine" down a board onto a driveway. He claimed that he strained himself in trying to keep the machine from falling. From five to ten minutes later he felt pain in the region of the rectum. His condition was diagnosed as internal and external hemorrhoids with a rectal abscess at the base of one of the external ones. He was advised by a Dr. Webb to undergo an operation to eradicate his hemorrhoids. He disregarded this advice, however, and instead obtained treatment from another physician, who advertised the cure of piles "without a knife." An ischiorectal abscess developed which eventually resulted in the formation of a fistula. Because of his condition, he lost about three and one-half weeks of work, and after resuming work he apparently was no longer able to do heavy work. He filed a claim with the workmen's compensation commission of Missouri for compensation under the workmen's compensation act of Missouri, claiming that his hemorrhoids and subsequent complications had been caused by strain in the course of his employment. The commission found that his condition had not been caused by the accident and denied

compensation. From a judgment of the circuit court affirming that award, the claimant appealed to the St. Louis court of appeals, Missouri.

Dr. Webb, one of the physicians who treated the claimant and the only witness other than the claimant to testify, in answer to a hypothetical question incorporating all the essential facts of the case and asking whether the accident had anything to do with the production of the hemorrhoids, testified: "I cannot see how a mere slipping of any kind would produce hemorrhoids unless it would cause the whole rectum to turn out and he would have immediate pain with the thing; he would suffer immediately without a lapse of any time." In his opinion, if the hemorrhoids had been due to the accident there would not have been a lapse of from five to ten minutes between the injury and the pain. In the judgment of the court of appeals, Dr. Webb's testimony furnished competent and substantial evidence to support the award of the workmen's compensation commission denying compensation. Accordingly, the judgment of the circuit court upholding the commission's award was affirmed.—*Nantron v. General Tile & Marble Co. (Mo.)*, 121 S. W. (2d) 246.

Health Insurance: "Medical or Surgical Attention" Defined.—In an action on a policy of accident and health insurance the court of appeals of Georgia, division 2, agreed with the decision in *Federal Life Ins. Co. v. Summerhill*, 45 Ga. App. 829, 166 S. E. 54, that the term "medical or surgical attention" as used in an application for health insurance means "medical or surgical attention for some illness or disease of substantial importance or of a serious nature and not consultation, treatment, or attendance concerning some trivial or temporary indisposition or feeling which has passed away without affecting the general health." In the judgment of the court, the policy of insurance was not rendered void by the denial of the insured, who later became ill with tuberculosis, in her application for insurance that she had received "medical or surgical attention" during the two years preceding her application, when in fact during that period of time she had consulted three physicians because of her spitting of blood but had been informed by them that they could find nothing the matter with her.—*North American Acc. Ins. Co. v. Gilbert (Ga.)*, 199 S. E. 768.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Association of American Medical Colleges, Cincinnati, Oct. 21-23. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
- Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.
- Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
- Gulf Coast Clinical Society, Mobile, Ala., Oct. 26-27. Dr. Clyde C. Rouse, 56 St. Joseph St., Mobile, Ala., Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
- National Society for the Prevention of Blindness, New York, Oct. 26-27. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.
- New York State Association of Public Health Laboratories, Albany, Nov. 3. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Oct. 23-27. Dr. J. D. McCarthy, 107 S. 17th St., Omaha, Secretary.
- Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Allen Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Southwestern Medical Association, El Paso, Texas, Nov. 9-11. Dr. M. P. Spearman, 1001 First National Bank Bldg., El Paso, Texas, Secretary.
- Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

18: 133-260 (Aug.) 1939

Electrocardiographic Picture of Experimental Localized Pericarditis. H. B. Burchell, A. R. Barnes and F. C. Mann, Rochester, Minn.—p. 133.

*Prognosis of Intraventricular Block. L. G. Kaplan and L. N. Katz, Chicago.—p. 145.

*Effect of Oxygen on Exercise Tolerance of Patients with Angina Pectoris. J. E. F. Riseman and M. G. Brown, Boston.—p. 150.

Cardiac Neurosis Associated with Organic Heart Disease. S. Schnur, Brooklyn.—p. 153.

Acute Endocarditis in Wild Animals, with Especial Reference to Opossum. H. Fox, Philadelphia.—p. 166.

Effects of Whole Bile and Bile Salts on Perfused Heart. K. G. Wakim, H. E. Essex and F. C. Mann, Rochester, Minn.—p. 171.

Congenital Heart Disease: Report of Case of Dextroposition, Persistence of Early Stage of Embryonic Development of Heart, Persistent Truncus Arteriosus, Abnormal Systemic and Pulmonic Veins and Subdiaphragmatic Situs Inversus. D. W. Goldman and N. S. Stern, Memphis, Tenn.—p. 176.

Medionecrosis Aortae Idiopathica Cystica: Report of Case, with "Healed" Dissecting Aneurysm. J. T. Roberts, Cleveland.—p. 188.

Effects of Diphtheria Toxin on Heart. R. W. Boyle, C. H. McDonald and A. F. DeGroate, Little Rock, Ark.—p. 201.

Effect of Carbon Dioxide Inhalation on Peripheral Blood Flow in Normal and in Sympathectomized Patient. I. E. Steck and E. Gellhorn, Chicago.—p. 206.

Value of Special Radiologic Procedures in Detecting Cardiac Enlargement in Children with Rheumatic Heart Disease. Ann G. Kuttner and Gertrude Meyersbach, Irvington-on-Hudson, N. Y.—p. 213.

Measurement of Circulation Time with Calcium Gluconate in Patients Receiving Digitalis, with Electrocardiographic Studies. H. C. Wall, New Orleans.—p. 228.

Prognosis of Intraventricular Block.—Kaplan and Katz collected data from the hospital and clinical records of 126 patients whose electrocardiograms conformed to the criteria for the various varieties of intraventricular block, all showing a QRS duration of 0.11 second or more. They find that the character of the underlying disease, rather than the presence or absence of intraventricular block, determines the prognosis, although the presence of intraventricular block carries with it a high mortality rate in the first year (particularly in the first three months). The fatality rate within a year of the discovery of the conduction lesion was 80 per cent. Patients surviving this period have a materially better life expectancy, as another 10 per cent died within the second year and some of the remaining 10 per cent survived up to the seventh year. Apparently, a relatively benign type of intraventricular block occurs. Therefore the configuration of the electrocardiogram or the duration of the QRS deflection is of no prognostic significance.

Oxygen, Exercise Tolerance and Angina Pectoris.—Riseman and Brown describe the effect of breathing high concentrations of oxygen on the amount of work which seventeen patients with angina pectoris could do before pain developed. Breathing room air from the Douglas bags did not increase and in several instances actually caused a decrease in the amount of work which could be done before pain developed. Breathing oxygen from the Douglas bags enabled eleven of the seventeen patients to do considerably more work; four exercised until forced to stop because of fatigue without developing pain. Nine of these eleven patients were from 39 to 53 years of age. Two were 57 and 58 years old. Seven patients found that it required more than thirty-five trips (mount and descend a two step staircase) to induce pain while breathing room air; the other four patients felt pain on less than thirty-five trips. The remaining six of the seventeen patients were not able to do any more work while breathing oxygen. Only one of these patients was less than 53 years of age, and only two could perform more than thirty-five trips before angina developed. The data are consistent with the anoxemia theory of angina pectoris.

American Journal of Diseases of Children, Chicago

58: 457-690 (Sept.) 1939

*Obesity in Childhood: I. Physical Growth and Development of Obese Children. Hilde Bruch, New York.—p. 457.

Enterogenous Intramural Cysts of Intestines. D. J. Pachman, Chicago.—p. 485.

New Creatinine Standard for Basal Metabolism and Its Clinical Application. N. B. Talbot, Jane Worcester and Ann Stewart, Boston.—p. 506.

*Prevention of Diphtheria. H. P. G. Seckel, Chicago.—p. 512.

Old Tuberculin and Purified Protein Derivative in Tuberculin Patch Test: Comparative Study. H. Vollmer, New York, and Esther W. Goldberger, Staten Island, N. Y.—p. 527.

*Influence of Fluid and of Evaporated Milk on Mineral and Nitrogen Metabolism of Growing Children. Helen J. Souders, Helen A. Hunscher, Frances C. Hummel and Icie G. Macy, with assistance of Mary F. Bates, Marion L. Shepherd, Priscilla Bonner, J. Horton, A. Theresa Johnston and Louise Emerson, Detroit.—p. 529.

Hyperparathyroidism in Children: Report of Two Cases. W. E. Anspach and W. M. Clifton, Chicago.—p. 540.

Importance of Sensitization Mechanism in Clinical Phenomenon of Allergy: Possible Cause and Prevention. E. B. Shaw and H. E. Thelander, San Francisco.—p. 581.

Causes of Prematurity: I. Review of Literature. Nina A. Anderson and R. A. Lyon, Cincinnati.—p. 586.

Development of Obese Children.—Bruch studied the growth and development of 102 children from 2 to 13 years of age whose obesity was the principal clinical symptom and she compared her observations with results obtained in normal children. One aim of the study was to establish an objective basis for the diagnosis of the underlying endocrine disorder, if any, through an analysis of the progress in growth. She finds that in obese children growth in stature is in excess of the average normal but in harmony with the height development of children who mature early. Skeletal maturation is normal or advanced, certainly not delayed. The menarche in obese girls occurs early, in several instances before the age of 10 years. More than 50 per cent of the boys between 11 and 14 years old show signs of approaching or attained puberal development. The high weight of the obese child is considered as an exaggeration of a normal trend. The observations of intensive growth and early maturation are not consistent with theories which attempt to explain obesity on the basis of hypothyroidism and hypopituitarism; they agree with observations of the growth-promoting effect of abundant nutrition.

Prevention of Diphtheria.—Seckel discusses three factors relating to the prevention of diphtheria. 1. The best statistical method of checking the efficiency of active immunization against diphtheria is the so-called control series method. Diphtheria morbidity in immunized children is only one third to one eighth or even less than that of nonimmunized children. The statistical method of comparing the diphtheria morbidity in a given area before and after the introduction of immunization should not be used for scientific purposes except against the background of the secular waves of diphtheria morbidity. 2. In general, the "severity" of diphtheria in immunized children is less than in nonimmunized controls. If the clinical typology of diphtheria in immunized children is analyzed statistically (according to Escherich's types), there is found an overwhelming majority of cases of localized pharyngeal diphtheria, an almost complete disappearance of diphtheritic croup and about the same percentage of cases of toxic diphtheria as for nonimmunized children. The last two types of severe diphtheria are clinically less alarming in immunized children than they are in the control groups. 3. While antitoxin therapy reaches the natural limits of its preventive efficiency in cases of progressive toxic and malignant diphtheria, its limits may be in part overcome by nonspecific preventive treatment: parenteral protein therapy and intravenous dextrose therapy. The two types of nonspecific treatment are combined in a routine way with the injection of medium doses of diphtheria antitoxin and may, in cases of malignant diphtheria, be combined with each other.

Type of Milk and Mineral and Nitrogen Metabolism.—Souders and her collaborators determined the relative efficiency of plain fluid and of evaporated milk in meeting the mineral and nitrogen demands of the growing child. The nitrogen and acid-base mineral balance study was conducted on three healthy growing children (from 4½ to 6 years old) who received a basal diet of inexpensive foods, always available, which conformed with accepted nutritive standards. Each child received 400 Gm. of plain fluid milk daily for from twenty-five to forty days; during the following twenty to twenty-five days the same

quantity of plain evaporated milk (diluted 1:1) was included in the diet, and finally for the next twenty-five days each child received an identical quantity of irradiated evaporated milk (diluted 1:1). The only changes in the dietary during the three study periods was the substitution of milk. An added impetus in the forming of soft tissue resulted from the substitution of evaporated for fluid milk. This was shown by the parallel increases in retention of nitrogen, sulfur and potassium, which were not accompanied by corresponding increases in retention of the other elements. When irradiated evaporated milk was included in the diet, the increased calcium-phosphorus ratios of the retentions, the higher levels and more consistent trends of the acid-base balances and the increase in rate of gain in recumbent length all indicated a more rapid and stable rate of ossous formation.

American Journal of Physiology, Baltimore

- 127: 211-414 (Sept.) 1939. Partial Index
Electrosaltatory Transmission of Nerve Impulse and Effect of Narcosis on Nerve Fiber. I. Tasaki, Tokyo, Japan.—p. 211.
Respiratory and Circulatory Responses to Intravenous Oxygen and Their Relation to Anoxemia. M. Dick, Durham, N. C.—p. 228.
Effects of Adrenalin on Reflex Excitability of Autonomic Nervous System. C. W. Darrow and E. Gellhorn, Chicago.—p. 243.
Ventricular Rate in Faradically Maintained Auricular Fibrillation: Index of Auriculoventricular Conductivity. S. A. Carlen and L. N. Katz, Chicago.—p. 272.
Effect of Hydrogen Ion Concentration Changes on In Vitro Oxygen Consumption of Tissues. A. Canzanelli, M. Greenblatt, Gertrude A. Rogers and D. Rapport, Boston.—p. 290.
Electrophysiologic Studies on Motility of Gastrointestinal Tract. E. Bozler, Columbus, Ohio.—p. 301.
Studies on Genesis of Ischemic Pain: Influence of Potassium, Lactate and Ammonium Ions. G. L. Mison, St. Louis.—p. 315.
Fifth Stage of Transmission in Autonomic Ganglions. A. Lanari and A. Rosenbluth, Boston.—p. 347.
Fate of Potassium Liberated from Muscles During Activity. W. O. Fenn, Rochester, N. Y.—p. 356.
Electrolytes of Muscle and Liver in Potassium Depleted Rats. L. A. Heppel, Rochester, N. Y.—p. 385.

Annals of Surgery, Philadelphia

- 110: 321-480 (Sept.) 1939
Surgical Management of Patent Ductus Arteriosus, with Summary of Four Surgically Treated Cases. R. E. Gross, Boston.—p. 321.
Reevaluation of Treatment of Head Injuries. J. Browder and R. Meyers, Brooklyn.—p. 357.
*Massive Hemorrhage in Peptic Ulcer: Transfusion Test for Determining the Necessity of Operation. J. W. Hinton, New York.—p. 376.
Value of Cecostomy as Complementary and Decompressive Operation. F. W. Rankin, Lexington, Ky.—p. 380.
Retropertitoneal Chyle Cysts, with Especial Reference to Lymphangiomas. J. C. A. Gerster, New York.—p. 389.
Role of Nervous System in Acute Intestinal Obstruction: Experimental Investigation. J. Fine, L. Rosenfeld and S. Gendel, Boston.—p. 411.
Treatment of Volkmann's Ischemic Contracture. H. W. Meyerdind and F. H. Krusen, Rochester, Minn.—p. 417.
Solitary Myeloma of Bone: Clinical and Pathologic Entity. J. G. Pasternack and R. L. Waugh, New Orleans.—p. 427.
Operation for Cure of Flatfoot. B. L. Schoofield, Dallas, Texas.—p. 437.
Treatment of Ankle Malunion: Study of End Results. W. R. Hamsa, Omaha.—p. 447.

Surgical Management of Patent Ductus Arteriosus.

Gross advises surgical obliteration for avoiding the complications to which the possessor of a patent ductus is liable. The operative steps for accomplishing this task were studied on post-mortem material, were practiced on dogs and are described. The author states that the ductus can be adequately exposed by an approach through the left pleural cavity, entering the superior mediastinum from its left lateral aspect. The feasibility of the method is demonstrated by the report of four patients on whom it was performed without mortality or complications. The results indicate that the ductus can be explored with safety and that it can be permanently ligated in most instances. It is important to recognize the condition, as surgery has much to offer these individuals. When there are no serious complicating cardiovascular lesions, surgical closure of the ductus can be performed with low risk and should ward off the dangers of subacute bacterial endocarditis and cardiac failure.

Massive Hemorrhage in Peptic Ulcer.—During a period of ten years, 135 cases of massive hemorrhage were encountered at the Bellevue Hospital, and twelve deaths occurred under conservative medical management. Hinton states that six of the patients died without blood transfusions and six after one or more transfusions. It would seem, therefore, that a definite percentage of massive hemorrhages will prove fatal under either

type of conservative management; i. e., regardless of transfusions. The location of the ulcer is an important factor in hemorrhage. It is the posterior duodenal ulcer (ten) that is most likely to prove fatal. Since the posterior duodenal ulcer frequently bleeds without having shown any previous gastric symptoms (18 per cent of the 135 patients had a negative gastric history), a posterior duodenal ulcer must be ruled out before one attributes the cause of gastric hemorrhage to gastritis. More than one negative gastrointestinal x-ray study should be obtained; the gastroscope is of no aid in making a diagnosis of posterior duodenal ulcer. Patients who continue to have hemorrhage under medical management become the province of the surgeon. In these cases operation during the acute stage may be a life saving measure. Blood transfusions may prove a helpful method of selecting the patients who urgently require such operation. When the blood pressure has fallen to 80/60, the erythrocyte count to 2,000,000 or less, and the hemoglobin to 35 per cent or thereabouts the patient needs supportive measures. A transfusion is the best way of overcoming the shock and the reduced blood volume. In addition, the transfusion may indicate whether operation is necessary or whether conservative measures should be continued. If, after 500 cc. of blood have been given, the red cell count, the hemoglobin and the blood pressure remain low, one may assume that a large vessel has been eroded. If the procedure is repeated and there is still no improvement, it is fairly conclusive evidence that further delay may prove fatal. A continuous transfusion of 1,000 cc. of citrated blood should then be started and the patient operated on as soon as possible. Further delay at this time would probably result in a fatality. The apparently hopeless case will withstand a subtotal resection surprisingly well.

Archives of Ophthalmology, Chicago

- 22: 351-532 (Sept.) 1939
Traumatic Retinal Angiopathy. A. J. Dedell, Albany, N. Y.—p. 351.
Sensitization of Rabbits to Uveal Tissue by Synergic Action of Staphylococci. H. Lucic, Baltimore.—p. 359.
Epithelial Plaques of Conjunctiva and Cornea. J. V. V. Nicholls, Montreal.—p. 370.
Subconjunctival Injections of Neoprontasil in Treatment of Ocular Infections. R. T. Paton, New York.—p. 377.
Changes in Angiosclerotic Associated with Inhalation of Oxygen. C. M. Rosenthal, Brooklyn.—p. 385.
*Relation Between Virus of Trachoma and Virus of Inclusion Blepharitis. A. E. Braley, Iowa City.—p. 393.
Form and Power of Contact Lenses. J. I. Pascal, New York.—p. 395.
Suggestions for New Design of Stock Contact Lenses. H. Eggers, New York.—p. 403.
*Determination of Sulfanilamide in Aqueous and Vitreous After Conjunctival and Oral Administration. W. G. Mengel, Philadelphia.—p. 406.
Classic Characteristics of Defects of Visual Field. J. N. Evans, Brooklyn.—p. 410.
Penetrating Injuries of Globe from Spectacle Glass: Report of Four Cases. W. D. Horner, San Francisco.—p. 439.
History of a Marble Bust of von Graefe. R. L. Pfeiffer, New York.—p. 446.
Origin of Vertebrate Eye. G. L. Walls, Detroit.—p. 452.

Trachoma and Inclusion Blepharitis Viruses.—According to the studies of Braley on four baboons, the virus of trachoma, like the virus of inclusion blepharitis, produces a cervicitis which, when transferred to the conjunctiva, produces follicular conjunctivitis. Both viruses have an affinity for the epithelial hyperplasia. No conjunctival immunity is produced by infection in the cervix in either disease. The virus of inclusion blepharitis produces a short infection, while the virus of trachoma gives rise to a prolonged infection. The severity of symptoms produced by the two viruses is equal. Since the two viruses produce a similar pathologic condition, a similarity in their nature appears probable.

Concentration of Sulfanilamide in the Eye.—Mengel determined the concentration of sulfanilamide in the aqueous and vitreous after oral and local administration. He made the investigations on blind eyes. The amount of sulfanilamide absorbed into the aqueous from the conjunctival cul-de-sac was less than 0.1 mg. per hundred cubic centimeters, whereas a concentration of from 1.5 to 3.2 mg. per hundred cubic centimeters was found in the aqueous and vitreous after oral administration. Thirty-two minutes after its ingestion sulfanilamide was found in the vitreous in a concentration of 1.1

mg. per hundred cubic centimeters. The therapeutic value of sulfanilamide is known for infections caused by certain microorganisms elsewhere in the body, and therefore because of its rapid diffusion in the ocular fluids it should be considered equally valuable for the treatment of infections of the eye caused by these same organisms.

Archives of Pathology, Chicago

28: 283-426 (Sept.) 1939

- Carcinoma Cells in Thoracic and in Abdominal Fluids. M. J. Schlesinger, Boston.—p. 283.
- Cerebral Lesions in Hypoglycemia: III. Experimental Investigations. A. B. Baker, Minneapolis.—p. 298.
- New Formation of Elastic Tissue in Adhesions Between Serous Membranes and in Myocardial Scars. C. H. Bunting, Madison, Wis.—p. 306.
- Histologic Study of Reparation of Experimentally Produced Defects in Calvariums of Rats. C. J. Sutro and S. A. Jacobson, New York.—p. 313.
- Chemotropism of Human Eosinophilic Polymorphonuclear Leukocytes. E. S. Ingraham and W. B. Wartman, Cleveland.—p. 318.
- Genesis of Infarction. L. Locflier, Decatur, Ill.—p. 323.
- *Incidence and Significance of Healed Miliary Tubercles in Liver, Spleen and Kidneys. II. S. Reichle and J. L. Work, Cleveland.—p. 331.
- Action of Estrogen on Skeletal Tissues of Immature Guinea Pigs. M. Silberberg and Ruth Silberberg, St. Louis.—p. 340.
- Auitschkow "Myocyte." J. C. Ehrlich and B. Lapan, New York.—p. 361.
- Changes in Prostate Caused by High Frequency Current. L. A. Maslow, Chicago, and E. Martos, Budapest, Hungary.—p. 371.
- Medial Degeneration of Aorta: Study of 210 Routine Autopsy Specimens by Serial Block Method. A. Rottino, New York.—p. 377.

Healed Miliary Tubercles in Viscera.—Because of a tentative hypothesis that the small calcified bodies occurring in the liver, spleen and other parenchymatous viscera are miliary tubercles, Reichle and Work conducted a systematic study on material obtained at necropsy in 500 consecutive cases. In the search for these lesions, particular care was taken to examine the organs for manifestations of active, latent or healed tuberculosis. Approximately two thirds of the lungs were injected with solution of formaldehyde U. S. P. (diluted 1 to 10) and sectioned. The remaining material was examined in the fresh state. Partial necropsies and necropsies on stillborn infants, premature infants and infants who died before discharge from the hospital were excluded. There were forty-eight such cases; 452 cases remain. Nodules were found in one or several of the parenchymatous organs in ninety-one, an incidence of 20.1 per cent. This is a high incidence, since few conditions other than parenchymatous degeneration, hyperemia, edema, primary tuberculosis and arteriosclerosis occur in more than one fifth of the bodies coming to necropsy in the Cleveland City Hospital. The nodules were not phleboliths but true miliary tubercles. They are microscopically indistinguishable from small primary tubercles. Animal inoculation demonstrated the presence of tubercle bacilli. Their distribution points to hematogenous dissemination and their morphology to some association in point of time with the primary complex. The high correlation between apparent resistance to progressive tuberculosis and the incidence of these lesions leads to the suggestion that this dissemination acts as an autovaccination, conferring a relatively high resistance to reinfection. The spleen was most commonly affected, in seventy-three of the ninety-one cases, the liver in forty-seven and the kidneys in two. In the liver they were usually situated just beneath but not within the capsule and were only occasionally found in the deeper parenchyma. In the spleen they were commonly encountered deep in the pulp and infrequently beneath the capsule. The nodules bore no necessary relation to the structure of the organ in which they occurred or to its blood vessels. They could be easily extracted from the parenchyma but could never be shelled out of a casing such as is consistently found about a phlebolith. The number of lesions varied widely. In a few cases only one or two nodules were found while in others they numbered several hundred.

Bulletin New York Academy of Medicine, New York

15: 577-636 (Sept.) 1939

- Some Difficulties in Use of Insulins in Diabetic Practice. W. R. Campbell, Toronto.—p. 579.
- Treatment of Postabortal and Postpartum Sepsis, with Special Consideration of Sulfanilamide and Allied Drugs. E. G. Waters, Jersey City, N. J.—p. 597.
- Pathogenesis and Present Day Treatment of Urinary Infections. M. F. Campbell, New York.—p. 609.

Journal of Bacteriology, Baltimore

38: 121-248 (Aug.) 1939

- Virus of Psittacosis: I. Propagation and Developmental Cycle in Egg Membrane, Purification and Concentration. A. S. Lazarus and K. F. Meyer, San Francisco.—p. 121.
- Id.: II. Centrifugation, Filtration and Measurement of Particle Size. A. S. Lazarus and K. F. Meyer, San Francisco.—p. 153.
- Id.: III. Serologic Investigations. A. S. Lazarus and K. F. Meyer, San Francisco.—p. 171.
- Comparison of Hydrogen Production from Sugars and Formic Acid by Normal and Variant Strains of *Escherichia Coli*. E. J. Ordal and H. O. Halvorson, Minneapolis.—p. 199.
- Inhibition of Proteinases of Certain Clostridia by Serum. L. D. Smith and C. H. Lindsley, Philadelphia.—p. 221.

Journal of Clinical Investigation, New York

18: 497-616 (Sept.) 1939

- Magnesium Content of Erythrocytes in Pernicious and Some Other Anemias. O. Bang, Copenhagen, Denmark, and S. L. Ørskov, Aarhus, Denmark.—p. 497.
- Rate of Attainment of Diffusion Equilibrium for Thiocyanate Between Plasma and Transudates Following Intravenous Injection of Sodium Thiocyanate in Patients with Edema. D. R. Gilligan and M. D. Altschule, Boston.—p. 501.
- *Formation of Methemoglobin and Sulfhemoglobin During Sulfanilamide Therapy. J. S. Harris and H. O. Michel, Durham, N. C.—p. 507.
- The In Vitro Formation of an Oxidizing Agent by Surviving Tissues and Sulfanilamide. J. S. Harris, Durham, N. C.—p. 521.
- *Clinical Studies of Blood Volume: VII. Changes in Blood Volume in Bright's Disease With or Without Edema, Renal Insufficiency, or Congestive Heart Failure, and in Hypertension. A. W. Harris and J. G. Gibson 2d, Boston.—p. 527.
- Inability to Demonstrate a Platelet Reducing Substance in an Acetone Extract of Spleen from Patients with Idiopathic Thrombocytopenic Purpura. F. J. Pollé and O. O. Meyer, Madison, Wis.—p. 537.
- Studies in Iron Transportation and Metabolism: III. Normal Fluctuations of Serum and "Easily Split-Off" Blood Iron in Individual Subjects. C. V. Moore, Virginia Minnich and Jo Welch, Columbus, Ohio.—p. 543.
- Id.: IV. Observations on Absorption of Iron from Gastrointestinal Tract. C. V. Moore, W. R. Arrowsmith, Jo Welch and Virginia Minnich, Columbus, Ohio.—p. 553.
- Treatment of Acute Alcoholism with Glucose and Insulin. W. Goldfarb, K. M. Bowman and S. Parker, with technical assistance of B. Krautman, New York.—p. 581.
- Blood V-Factor (Coenzyme) Level in Normal and Pathologic Subjects. H. I. Kohn and F. Bernheim, with technical assistance of A. V. Felsovanyi, Durham, N. C.—p. 585.
- Treatment of Gas Gangrene Infections in Guinea Pigs with Neoprontosil, Sulfanilamide and Sulfapyridine: Experimental Study. D. B. Kendrick Jr., Rochester, Minn.—p. 593.
- Ultrafiltrable Magnesium in Hyperthyroidism. L. J. Soffer, D. A. Dantes, E. B. Grossman, H. Sobotka and Mildred D. Jacobs, New York.—p. 597.
- Coagulation Defect in Hemophilia: Clot Promoting Activity in Hemophilia of Berkefeld Normal Human Plasma Free from Fibrinogen and Prothrombin. E. L. Lozner, R. Kark and F. H. L. Taylor, Boston.—p. 603.
- *Occurrence of Abnormal Dark Adaptation and Its Relation to Vitamin A Metabolism in Patients with Cirrhosis of Liver. A. J. Patek Jr. and C. Haig, New York.—p. 609.

Methemoglobin, Sulfhemoglobin and Sulfanilamide.—Harris and Michel assayed quantitatively the effect of sulfanilamide on the formation of abnormal heme pigments. There were 960 blood examinations made on 476 patients. Methemoglobin, in quantities demonstrable by the hand spectroscope, was found in the erythrocytes of 277, or 58 per cent, of the patients at some time during the administration of sulfanilamide. The percentage of patients developing methemoglobinemia is roughly equal in the sexes but is higher in the young. Since the extent of methemoglobinemia did not increase markedly with the duration of dosage, it is not a cumulative effect of the drug and does not depend on the total dose of sulfanilamide. It is possible that the development of methemoglobinemia is favored by the presence of larger concentrations of circulating hemoglobin. To analyze this factor, 647 determinations on patients who showed methemoglobinemia at some time during their course of therapy were arranged in accordance with the hemoglobin content and the level of blood sulfanilamide. It was found that the percentage of bloods positive for methemoglobin in each sulfanilamide level group did not vary with the hemoglobin content. However, the average methemoglobin concentration showed a tendency to vary in direct relation to the amount of hemoglobin present, so that the average methemoglobin/total hemoglobin ratio remained rather constant at each blood sulfanilamide level. The blood hemoglobin levels were rather evenly distributed and unaltered by the age, sex and sulfanilamide concentration of patients. Sulfhemoglobinemia was more frequent after long courses of sulfanilamide but did not bear any relationship to age, sex or the concentration of sulfanilamide or

methemoglobin in the blood. On the basis of these observations, it is postulated that an active substance is normally produced in the course of sulfanilamide metabolism which causes the production of methemoglobin and sulfhemoglobin. The data presented are found to agree with the concept that methemoglobinemia depends on the balance of the formation of the active agent, oxidation of hemoglobin under the influence of the active agent and reduction of methemoglobin by the body.

Blood Volume in Nephritis.—Harris and Gibson observed the course of the plasma and total blood volume in nephritis. Three factors appear to be concerned in the regulation of the plasma volume: serum albumin concentration, nonprotein nitrogen concentration and the degree of anemia. Regardless of the stage of the disease, whether acute, subacute or chronic, with or without edema or renal insufficiency, the level of the plasma volume reflects the interrelationship of these three factors. The relationship of the changes in plasma and circulating erythrocyte volume is such that the total blood volume always remains below normal. With development of congestive heart failure, regardless of the degree of anemia present, an additional factor appears to be introduced resulting in an increased circulating erythrocyte volume and hence increased total blood volume. In the edematous stage hypoproteinemia tends to diminish, and, if present, anemia tends to augment the plasma volume. During diuresis there is a tendency for the plasma volume to increase chiefly in relation to the increase in the albumin fraction of the serum protein. Circulation time in the group of cases exhibiting subacute glomerular nephritis with edema (nephrosis syndrome) was slower than in the group with chronic nephritis without edema. The lowered metabolism characteristic of the former group may explain this paradoxical observation.

Dark Adaptation, Vitamin A Metabolism and Cirrhosis.—Whether vitamin A deficiency occurs in patients with hepatic disease whose intake of the vitamin is adequate and who are not jaundiced was determined by Patek and Haig by studies on vitamin A metabolism in twenty-four cases of cirrhosis of the liver. The studies show that patients with cirrhosis of the liver may be deficient in vitamin A. The deficiency is not attributable to an inadequate intake of the vitamin in their food. Although the selected cases were free of jaundice, it is possible that malabsorption contributed to the deficiency. The patients' resistance to oral therapy might be so interpreted. Abnormal dark adaptation was observed in nineteen of the twenty-four cases. In certain cases both elevation of the final rod and cone thresholds and delay of rod dark adaptation occurred. In most instances only the latter change took place. These changes were unrelated to jaundice. They tended to persist in the presence of a nutritious diet, rich in vitamin A. The oral and parenteral administration of vitamin A concentrates was followed by extensive improvement. Cone and rod thresholds were lowered and speed of adaptation was increased. This improvement was only partially maintained after treatment was discontinued. These data suggest that abnormal dark adaptation in patients with cirrhosis of the liver is due chiefly to altered intermediary metabolism of vitamin A.

Journal of Experimental Medicine, New York

70: 223-332 (Sept.) 1939

- Production of Kidney Antibodies by Injection of Homologous Kidney Plus Bacterial Toxins. F. F. Schwenker and F. C. Comploier, Baltimore.—p. 223.
- Culture Flask for Circulation of Large Quantity of Fluid Medium. C. A. Lindbergh, New York.—p. 231.
- Immunologic Relationship of Capsular Polysaccharide of Type XIV Pneumococcus to Blood Group A Specific Substance. P. B. Beeson and W. F. Goebel, New York.—p. 239.
- Studies on Bactericidal Agent Extracted from Soil Bacillus: III. Preparation and Activity of Protein-Free Fraction. R. J. Dubos and C. Cattaneo, New York.—p. 249.
- Manner of Growth of Frog Carcinoma, Studied by Direct Microscopic Examination of Living Intra-Ocular Transplants. B. Lucké and H. Schlumberger, Philadelphia.—p. 257.
- Characteristics of Frog Carcinoma in Tissue Culture. B. Lucké, Philadelphia.—p. 269.
- Passage of Proteins from Vascular System into Joints and Certain Other Body Cavities. G. A. Bennett and M. F. Shaffer, Boston.—p. 277.
- Passage of Type III Rabbit Virulent Pneumococci from Vascular System into Joints and Certain Other Body Cavities. M. F. Shaffer and G. A. Bennett, Boston.—p. 293.
- Encephalopathy Following Injections of Bone Marrow Extract. L. S. King, Princeton, N. J.—p. 303.
- Further Contribution to Vitamin C Therapy in Experimental Poliomyelitis. C. W. Jungblut, New York.—p. 315.

Journal of Pediatrics, St. Louis

15: 157-316 (Aug.) 1939

- Immunologic Relationships Between Cow's Milk and Goat's Milk. L. W. Hill, Boston.—p. 157.
- Acute Coccidioidomycosis with Erythema Nodosum in Children. H. K. Faber, C. E. Smith and E. C. Dickson, San Francisco.—p. 163.
- Relation of Dysentery to Acute Diarrhea of Infants and Children. M. L. Cooper, M. L. Furecolow, A. G. Mitchell and G. E. Cullen, with assistance of Helen M. Keller, Barbara Johnson, Janet P. Milliken, H. F. Marsh, F. J. Grahill and G. W. Thomas, Cincinnati.—p. 172.
- Vitamin A Absorption in Celiac Disease. B. B. Breese Jr. and Augustus B. McCoord, Rochester, N. Y.—p. 183.
- Test for Determination of Vitamin C Storage: Vitamin C Index. L. Kajdi, J. Light and Charlotte Kajdi, Baltimore.—p. 197.
- *Comparison of Vollmer Tuberculin Patch Test with Purified Protein Derivative: Results of Tests on 880 Rural School Children in St. Mary's County, Maryland. E. C. Peck and M. E. Wegman, Baltimore.—p. 219.
- *Study of 1,852 Chest Roentgenograms of Tuberculous Contacts Under Age of 5 Years. H. A. Rosenberg and M. I. Levine, New York.—p. 224.
- Value of Roentgenographic Examination in Diagnosis of Syphilis in New-born Infants. A. U. Christie, San Francisco.—p. 230.
- Treatment of Scarlet Fever with Specific Antitoxins of Low Protein Content. J. A. Toomey and E. R. Kimball Jr., Cleveland.—p. 238.
- Control of Common Contagious Diseases in Pediatric Wards of a General Hospital. C. C. Fischer and C. S. Raue, Philadelphia.—p. 245.
- Multiple Cystic Tuberculosis of Bones: Report of Case. D. W. Martin, Durlam, N. C.—p. 254.

Comparison of Tuberculin Tests.—Over a period of two months Peck and Wegman performed tuberculin tests on 880 school children. Their ages varied from 5 to 21. The first and second purified protein derivative doses were injected intradermally and the Vollmer patch test was applied to the skin. The first purified protein derivative dose was injected and the patch test applied on the same day and both were read two days later. Those children who were negative to the first purified protein derivative test were tested with the second purified protein derivative dose and this was read two days later. In all cases in which the patch test was positive, it was found that it was as definite on the second day as it was on the first day, or even stronger, indicating that one may read the test forty-eight hours after removal of the adhesive tape just as well as after twenty-four. At least one of the three tests used was positive in 319, or 36.2 per cent, of the children. The patch test was far inferior to purified protein derivative in detecting tuberculin reactors. It was not even as good as the first strength of purified protein derivative, even though the patch test did pick up some reactors who were negative to the first strength of purified protein derivative. The patch test did pick up eighteen, or 9.6 per cent, of the 188 in which the first dose of purified protein derivative was negative. By contrast, however, the first dose of purified protein derivative detected fifty-five, or 24.4 per cent, of the 225 in which the patch was negative. It seems to be clear that the patch alone cannot replace purified protein derivative either as a diagnosticum for the individual patient or as a case-finding procedure in public health work. Because of the obvious convenience of the patch test, a possible field of usefulness suggests itself. One might employ the patch for the primary test in place of purified protein derivative, recognizing that if the test is negative it must be followed by the second strength of purified protein derivative before a definite opinion can be given.

Chest Roentgenograms of Tuberculous Contacts.—Rosenberg and Levine studied 1,852 roentgenograms of the chests of 584 infants, varying in age from birth to 5 years, from tuberculous homes. Among 379 cases in which Mantoux tests were negative, the incidence of tracheobronchial shadows alone was 6.8 per cent and the incidence of parenchymal shadows was also 6.8 per cent. Among 205 cases in which Mantoux tests were positive, the incidence of tracheobronchial shadows was 9.2 per cent and that of parenchymal shadows was 40 per cent. Increased tracheobronchial shadows persisted for more than three months in 26.6 per cent of the cases in which the Mantoux tests were negative, as against 71.3 per cent of the Mantoux tests were positive. Parenchymal cases in which the tuberculin test was positive. Parenchymal shadows persisted on subsequent examination for three months or more in eight of sixteen of the negative Mantoux cases and in sixty-one of the sixty-six positive tuberculin cases. Infants dying of tuberculosis generally show demonstrable parenchymal shadows on a roentgenogram. Since miliary tuberculosis was the most frequent cause of death in the series of cases, the diagnosis of lethal forms of tuberculosis by x-ray examination

was readily made. Increased tracheobronchial shadows in infancy may not be accepted as pathognomonic of tuberculosis, even in the presence of a positive Mantoux test. However, a majority of the parenchymal lesions in tuberculin positive infants are probably tuberculous in nature.

New England Journal of Medicine, Boston

221: 291-328 (Aug. 24) 1939

- Transient, Recurrent Bundle Branch Block. H. Miller and F. T. Filton, Providence, R. I.—p. 291.
*Phenolphthalein Test in Diagnosis of Gastrointestinal Disease. B. M. Banks and L. E. Barron, Boston.—p. 296.
*Clinical Experience with 95 to 98 per Cent Oxygen in Treatment of Abdominal Distention and Other Conditions. P. Congdon and A. M. Burgess, Providence, R. I.—p. 299.
Perianal Cryptic Tabs. E. T. Whitney and J. F. Keane, Boston.—p. 303.
Pediatrics. R. C. Eley, Boston.—p. 306.

Phenolphthalein Test in Gastrointestinal Disease.—In order to determine the rationale of the phenolphthalein test in the diagnosis of gastrointestinal disease, as suggested by Woldman, 203 patients were submitted to the test by Banks and Barron. Of these, fifty-two had intrinsic lesions of the gastrointestinal tract. The remaining 151 had a variety of conditions other than those of the gastrointestinal tract or no demonstrable pathologic lesion and served as controls. Only thirty-six positive tests were obtained in the group of fifty-two patients. Carcinoma of the stomach and intestine gave the highest proportion of positive results, whereas negative tests were found in two cases of esophageal carcinoma, possibly owing to the brief period of contact between the drug and the diseased area. Ulcers of the mouth and pharynx gave uniformly positive tests. Of twenty-two patients with gastric or duodenal ulcer, approximately one third yielded negative results. More detailed analysis of these failures revealed that gastric stasis or pyloric obstruction with fluid retention and possible precipitation of the drug might account for several, and one patient had an ulcer high in the cardia. No explanation was apparent in the remainder. There were three failures in four cases of chronic ulcerative colitis or amebic dysentery characterized by frequent liquid stools daily. Here again insufficient contact due to the hypermotility of the intestine may have been a factor. In the control subjects the test yielded 127 negative and twenty-four positive tests. The test was consistently negative in cases of hysteria, unexplained syncope, anorexia nervosa, diabetes and osseous disease. Positive tests were found especially in serious and advanced heart disease with pulmonary edema, paroxysmal nocturnal dyspnea, coronary occlusion, acute toxemia, infection and malignant metastasis. One must assume either that breaks in the mucous membrane of the alimentary canal frequently exist under such conditions or that the vitality of the cells is so impaired that the enteric membrane no longer acts as an efficient barrier to the drug. Several asthmatic patients also excreted significant amounts of free phenolphthalein in the urine. It is the authors' impression that the test may find its greatest field of usefulness among ambulatory patients, in whom the chance of obtaining false positive tests because of severe toxemia or far advanced systemic disease would be largely eliminated. In view of the rapid absorption from oral lesions which might obscure a more serious condition lower down, the patient should drink the test fluid through a straw, rinsing the mouth immediately and thoroughly with water without swallowing further. Excessive salivation should be noted and prevented from interfering with the test. In cases of suspected gastric disease, the test is best done after gastric lavage or gastric analysis in order to obviate retention and consequent excessive dilution of the test liquid. At times catheterization to obtain the urine specimens may be indicated, as in prostatic cases in watery diarrhea.

Oxygen for Abdominal Distention and Emphysema.—Congdon and Burgess used 95 to 98 per cent oxygen in the treatment of forty cases of abdominal distention and three cases of subcutaneous emphysema treated. Twenty-five of the patients with abdominal distention were strikingly benefited, the benefit in five was questionable and ten were uninfluenced. Of those with emphysema, all had satisfactory results. Following encephalography the routine use of the method has appeared to prevent severe headaches. It is in severe abdominal distention, such as that which is seen in certain infec-

tious diseases, notably pneumonia, typhoid and peritonitis after abdominal operations, that the method is most useful and at times life saving. It should be considered an emergency measure when simpler means have failed.

New Jersey Medical Society Journal, Trenton

36: 473-522 (Aug.) 1939

- Factors Determining Localization of Organ Tuberculosis. S. Berg, Newark.—p. 479.
Primary Bronchopulmonary Aspergillosis. A. J. Stolow, Glen Gardner.—p. 484.
Neurosurgical Aspects of Cranial Neuralgias: Trigeminal Neuralgia, Glossopharyngeal Neuralgia and Ménière's Syndrome. W. Ehrlich, Newark.—p. 486.
Perineal Repair: Choice of Operation. D. N. Barrows, New York.—p. 492.
Management of the Rheumatic Patient. J. G. Kaufman, Newark.—p. 496.
Toxemias of Pregnancy. A. J. Walscheid, Union City.—p. 500.
Clinical Manifestations and Management of Early Syphilis. G. D. Astrachan, New York.—p. 508.
Maternal Mortality Statistics 1938. A. W. Bingham, East Orange.—p. 510.

Pennsylvania Medical Journal, Harrisburg

42: 1297-1424 (Aug.) 1939

- Gastrointestinal Manifestations of Urinary Disease and Urinary Manifestations of Gastrointestinal Disease. P. W. Brown and E. G. Wakefield, Rochester, Minn.—p. 1309.
Rationale of Cholecystectomy in Noncalculous Gallbladders. L. D. O'Donnell, Pittsburgh.—p. 1315.
Cancer. S. P. Reimann, Philadelphia.—p. 1319.
Treatment of Fractures of Hip. L. F. Bush, Danville.—p. 1325.
Physical Therapy in Otolaryngology. W. H. Schmidt, Philadelphia.—p. 1330.
Management of the Gallbladder Patient. M. E. Rehfuess, Philadelphia.—p. 1335.
*Vaccination During Pregnancy as Prophylaxis Against Puerperal Infections. J. B. Bernstine and G. W. Bland, Philadelphia.—p. 1340.

Vaccination for Puerperal Infections.—A second series of 177 pregnant women vaccinated against puerperal infections are the subject of the report by Bernstine and Bland. The article dealing with the first series of fifty-one pregnant women so vaccinated was abstracted in THE JOURNAL, March 21, 1936, page 1037. The vaccine consists of five strains of Streptococcus haemolyticus, eight of Streptococcus viridans, two of Staphylococcus aureus, two of Bacillus coli communis, four of Streptococcus nonhaemolyticus and ten of Staphylococcus albus. The respective percentages of these strains in the vaccine are 35, 15, 15, 15, 10 and 10. The patients (228) in both series were delivered with no fatalities. The puerperal morbidity was 5.4 per cent as compared to the morbidity of the nonvaccinated women, which was 19.2 per cent. Ninety male and eighty-two female children were born to the 177 vaccinated patients. There were three abortions and two stillbirths. In the entire group there were three abnormalities—hemangioma of the maxilla, supernumerary digits and left clubfoot. The vaccine was administered to pregnant women with various complications in addition to their pregnant state. These complications varied in type and severity, and yet not a single case was observed that presented an aggravation of the preexisting condition. The patients were not hand picked but represent a cross section of the average obstetric practice with its associated complications.

Public Health Reports, Washington, D. C.

54: 1509-1546 (Aug. 18) 1939

- *Treatment of Induced Malaria in Negro Paralytics with Mapharsen and Tryparsamide. M. D. Young and S. B. McLendon.—p. 1509.
Pulmonary Tumors in Mice: Parts VI, VII, VIII and IX. H. B. Andervont.—p. 1512.

Induced Malaria in Negroes with Dementia Paralytica.—According to Young and McLendon during the last year, at the South Carolina State Hospital, ten Negro dementia paralytica patients who had been infected for therapeutic purposes with quartan malaria were given mapharsen. Each patient received 0.04 Gm. of mapharsen intravenously weekly for a period of ten weeks. At the same time 0.02 Gm. of thiobismol was given. Subsequently, two of the ten patients received a course of tryparsamide. Twenty-two weeks after the completion of the mapharsen treatment, blood smears from all ten patients still showed parasites (Plasmodium malariae) although the patients showed no symptoms of the disease. To test the viability of the parasites, subinoculations were made from two of the mapharsen-treated persons to two uninfected subjects.

Typical symptomatic and parasitic infections with quartan malaria developed in both, which showed that the mapharsen had not affected the viability of the malaria parasites. Examinations were made of three quartan malaria patients who had received trypanarsamide in antisyphilitic treatment. One year after the completion of the trypanarsamide treatment two patients still harbored *Plasmodium malariae* in the blood stream. Another patient still had parasites nine months after treatment. Another group of eight patients was started on trypanarsamide. Four patients completed the treatment and the malaria parasites were continually present. Treatment of the other four was interrupted after the fifth week, and all had shown malaria parasites continually. Subinoculation from one of this group resulted in a typical symptomatic and parasitic course of malaria, showing that the parasites were still viable. As these drugs relieved the symptoms without eradicating the infection, their use might inadvertently result in quartan malaria carriers being released and thus establish foci of infections of a type of malaria now rare in the United States.

54: 1547-1586 (Aug. 25) 1939

- Natural Infection of *Triatoma Gerstaeckeri* with *Trypanosoma Cruzi* in Texas. A. Packchanian.—p. 1547.
Disabling Morbidity Among Industrial Workers, First Quarter of 1939. W. M. Gafar.—p. 1554.
*Outbreak of Botulism in Tennessee Due to Type B *Clostridium Botulinum*. C. B. Tucker and H. Swanson.—p. 1556.

Botulism in Tennessee.—Tucker and Swanson report two cases of botulism, which are of particular interest because for the first time *Clostridium botulinum* toxin was demonstrated to be present in home-canned vegetables in Tennessee. Moreover, for the first time in Tennessee *Clostridium botulinum*, type B, was actually recovered. Twenty cases of botulism in Tennessee which occurred prior to 1939 are reviewed. Home-canned okra and possibly home-canned beans were the foods responsible for the two cases reported.

Wisconsin Medical Journal, Madison

38: 605-708 (Aug.) 1939

- Use and Importance of Electrocardiography in Prognosis and Treatment of Diseases of Heart by the General Practitioner. W. Adams, Chicago.—p. 623.
Low Grade Occult Inflammatory and Neoplastic Diseases of Orbit. W. L. Benedict, Rochester, Minn.—p. 628.
The Asphyxiated Infant. H. A. Cunningham and A. B. Schwartz, Milwaukee.—p. 632.
*Evaluation of Therapy in Trigeminal Neuralgia: Results of Treatment with Typhoid Vaccine in Eighteen Cases. E. R. Schmidt, Madison, and J. M. Sullivan, Milwaukee.—p. 635.
Convalescent Serum in Contagious Diseases. J. A. Conner, Chicago.—p. 638.
Aberrant Gastric Mucosa in Rectum with Ulceration and Hemorrhage. G. H. Ewell and R. H. Jackson Sr., Madison.—p. 641.
Treatment of Prostatic Obstruction: Analysis of 300 Cases. W. G. Sexton, Marshfield.—p. 644.

Trigeminal Neuralgia.—In evaluating the results of hyperpyrexia treatments in trigeminal neuralgia, Schmidt and Sullivan chose typhoid vaccine because of its ease of administration and handling, treating eighteen patients. Injections at about biweekly intervals, starting with a dose of 10,000,000 killed organisms, were given intravenously, and the doses were stepped up by ten or twenty million each time until a good thermal reaction was obtained. Early in their series they learned that results could be obtained as readily with a mild fever response as with a high thermal reaction. The majority of their patients were hospitalized for their treatments, but several ambulatory patients were treated and no ill effects have been encountered. Of five patients more than 80 per cent relief was obtained and they were satisfied to control their residual tic with mild analgesics or Christian fortitude rather than submit to further therapy. Of five other patients, relief was complete and continuous. Four patients experienced complete relief for from two to four months and failed to respond to a second course of vaccine therapy, so that alcohol injections were necessary for the further control of the tics. Three patients obtained 50 per cent relief or less and needed alcohol injections to complete their treatment. Only one patient in the series failed to show some amelioration of symptoms following vaccine therapy; the sensory root of the trigeminal nerve was resected and complete relief ensued. Women showed a slightly better response than men to this form of treatment. Snake venom in a trial group proved unsuccessful in relieving pain of this type.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

9: 1-110 (July) 1939

- Sir Kenneth Digby and His "Choice Receipts." K. F. Russell.—p. 3.
The George Adlington Syme Oration: Surgery in England in the Making. A. Webb-Johnson.—p. 10.
Early Symptomatology and Conservative Treatment of Bladder Neck Obstructions. R. J. Silverton.—p. 31.
Some Points in Treatment of Retinal Detachment. J. R. Andersen.—p. 35.
Sinusitis. G. C. Scantlebury.—p. 46.
Mechanical Principles in Causation and Treatment of Disease: Lecture I. Fay Maclure.—p. 66.

British Journal of Medical Psychology, London

18: 105-284 (July) 1939

- Psychologic Observations on Hematemesis. A. T. M. Wilson.—p. 112.
Symbolic Significance of Glass and Its Relation to Diseases of Eye. W. S. Inman.—p. 122.
Case of a Middle-Aged Embezzler. D. Forsyth.—p. 141.
Conception of Dread of Strength of Instincts. N. J. Symons.—p. 151.
Is Aggression an Irreducible Factor? W. R. D. Fairbairn.—p. 163.
Aggression. A. W. Wolters.—p. 171.
Aggression in Early Childhood. Karin Stephen.—p. 178.
Sin, Sex and Sickness in Sautelaux Belief. A. I. Halliwell.—p. 191.
Analytic Observations on Scala Perfectionis of Mystics. P. Hopkins.—p. 198.
Some Interpretations of Painting Called "Abstraction." R. W. Pickford.—p. 219.
Studies on Psychopathology of Compulsive Wandering: Preliminary Report. E. Stengel.—p. 250.

British Journal of Surgery, Bristol

27: 1-208 (July) 1939

- *Increased and Decreased Density of Bone, with Special Reference to Fibrosis of Marrow. H. A. T. Fairbank.—p. 1.
Improved Spinal Analgesia. G. Macpherson.—p. 34.
Treatment of Empyema Thoracis by High Negative-Pressure Drainage. E. R. Trethowie.—p. 58.
Veritol: Blood Pressure Stimulant for Use During and After Operations. H. Dodd and G. Merton.—p. 78.
Spontaneous Rupture of Gallbladder with Massive Intraperitoneal Hemorrhage. R. Mailer.—p. 91.
*Vascular Anomalies of Upper Limbs Associated with Cervical Ribs: Report of Case and Review of Literature. R. M. Hill.—p. 100.
Vascular Complications of Cervical Ribs and First Thoracic Rib Anomalies. K. C. Eden.—p. 111.
S. H. Bailey.—p. 140.
C. Due to Dysenteric Ulceration: Case. F. M. Collins.—p. 144.
S. W. Kark.—p. 149.
S. New Abduction Splint. W. A. Cochrane.—p. 151.
S. of Cut Pancreatic Duct into Duodenum. D. J. Harries.—p. 154.
Congenital Absence of Right Femur. K. Manohar.—p. 158.
Congenital Defect of Shaft of Femur. H. H. Langston.—p. 162.
*Gallstones and Cancer: Problem of Etiology, with Special Reference to Role of Irritation. H. Burrows.—p. 166.

Density of Bone and Fibrosis of Marrow.—Fairbank lists the principal conditions in which more or less severe generalized osteoporosis, or want of density of the skeleton as a whole, is found: osteogenesis imperfecta, osteogenesis imperfecta cystica, infantile scurvy, rickets, osteomalacia, celiac rickets, idiopathic steatorrhea in adults, renal rickets, renal glycosuria in adults, hyperparathyroidism, osseous dysplasia following icterus neonatorum, thyrotoxic osteoporosis in adults, osteoporosis due to pituitary basophilism, senile osteoporosis and generalized osteoporosis from prolonged recumbency and cachexia. Alterations in the density of the bones are in the direction either of osteoporosis or of osteopetrosis. These two changes may be present in a single case, even in a single bone, there being a tendency in many cases for an initial osteoporosis to be replaced by increased density. The author suggests that marble bones with a limited distribution, generally known as melorheostosis, is really a particular type of diffuse fibrosis of bone. Some evidence is presented that generalized osteopetrosis or Albers-Schönberg's disease, may be similar. The occasional association of cutaneous lesions, usually of a fibrotic nature, with multiple bone changes is commented on. In the etiology of the more obscure disorders it is possible that the parathyroids may be responsible, partly or entirely, for such diverse conditions as renal rickets and marble bones, as well as for the fibrocystic osseous changes of hyperparathyroidism.

Vascular Anomalies of Upper Limbs and Cervical Ribs.—Hill cites a case of bilateral cervical ribs accompanied only by vasomotor disturbances of the hands of the acropara-

type in which removal of a rib and the fibromuscular band relieved pain, diminished swelling and improved the color of the hand on the corresponding side. Other anatomic variations are worthy of consideration in cases of vascular disorders of the upper extremities and, with rational indications, exploratory operation on this region would be warranted.

Gallstones and Cancer.—In order to prove further that chronic irritation is not the cause of cancer, Burrows placed gallstones and other foreign bodies in the gallbladders of fifty guinea pigs, which subsequently lived for periods varying from nine to 359 weeks. In no instance did cancer of the gallbladder develop. These results are regarded as supporting the view that experimentally chronic irritation alone is not the cause of cancer.

British Medical Journal, London

2: 265-320 (Aug. 5) 1939

- Present Position of Chemotherapy by Drugs of Sulfanilamide Group: Bacteriologic and Experimental Aspect. C. H. Browning.—p. 265.
Pharmacology of Sulfanilamide Group of Drugs. G. A. H. Bittle.—p. 269.
Achlorhydric Hypochromic Anemia Associated with Peripheral Neuritis: Report of Two Cases. C. Worster-Drought and J. Shafar.—p. 273.
Rheumatism and Climate. L. Hill.—p. 276.
Hepatic Insufficiency in Scarlet Fever. R. W. Carslaw.—p. 278.

Rheumatism and Climate.—The literature contains many speculations about the influence on rheumatism of cold and damp, cyclonic disturbances, the electrical state of the atmosphere and the like but Hill states that the evidence shows that it is conditions produced by dirty, artificially heated and poorly ventilated houses and density of population which cause decay of teeth, catarrhal infections and rheumatic troubles. The ill effects of these conditions are intensified by a diet in which the protective foods are deficient. Women suffer from rheumatic troubles more than men, because the latter by going to work change to better conditions. The fear of cold intensifies the ill effects of the indoor environment.

Hepatic Insufficiency in Scarlet Fever.—Carslaw studied 219 cases of scarlet fever in the hope of detecting some warning in those cases in which nephritis developed later. He noticed that there was a general fall in the urea factor throughout the first three weeks of the illness and that the figure was at its lowest at the critical period—that is, at the period when nephritis most commonly occurs; at the end of the third week. The urea factor was found to be lower in the nephritic than in the non-nephritic cases. Therefore the author proposes the determination of the specific gravity of the urine and the percentage of urinary urea as a clinical test of hepatic function. The urea factor can be of value in the prognosis of scarlet fever.

2: 321-382 (Aug. 12) 1939

- Medical Treatment of Peptic Ulcer and Its Complications. E. Menten-gracht.—p. 321.
Food Conservation in Relation to National Food Supply. J. Barcroft.—p. 324.
Commoner Types of Supersensitiveness and Their Management. J. G. Graham and J. D. O. Kerr.—p. 327.
Nicotinic Acid in Treatment of Delirium Tremens. F. Mainzer and M. Krause.—p. 331.
Hematemesis and Melena: Observations on Salt and Water Requirements. F. A. Jones.—p. 332.
Series of 200 Cases of Esophagoscopy for Foreign Bodies. F. G. Wrigley.—p. 334.

Nicotinic Acid for Delirium Tremens.—Mainzer and Krause state that in a chronic whisky addict an attack of delirium tremens (recurrence) associated with severe gastrointestinal manifestations and acute stomatitis was made to disappear within twelve hours by the administration of 0.6 Gm. of nicotinic acid. Previous to this, thiamin chloride had been given in large doses without any perceptible result. The prompt response to nicotinic acid favors the assumption that lack of this vitamin is an important factor in the development of delirium tremens.

Salt and Water Requirements in Hematemesis and Melena.—Jones examined the postmortem records of seven cases of hematemesis and melena that have ended fatally after hemorrhage had ceased, that is delayed death. An analysis indicates that severe dehydration was the common factor in these cases and that symptoms were masked by the liberal administration of opiates. The dehydration was due partly to insufficient fluid intake and partly to a forced diuresis. The latter was

probably the result of a much increased excretion of urea, presumably derived from the digestion of blood in the intestine. Such patients should receive enough fluid to meet the normal requirements of the kidneys, skin and lungs, and to replace any abnormal fluid loss. In addition, it is recommended that they should be given 10 Gm. of sodium chloride daily during the first few days after the hemorrhage.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

46: 645-812 (Aug.) 1939

- *Maternal Age and Parity in Placenta Praevia. L. S. Penrose.—p. 645.
Studies in Vaginal Fluid. N. Lissimore and D. W. Currie.—p. 673.
*Pathology of Hyperemesis and Vomiting of Late Pregnancy. H. L. Sheehan.—p. 685.
*Some Problems Concerning Etiology and Treatment of Hyperemesis Gravidarum. E. Bandstrup.—p. 700.
Vaginal Implantations in Uterine Carcinoma. G. I. Strachan.—p. 711.
Glycogen Content of Fallopian Tubes During Menstrual Cycle and During Pregnancy. K. Joel.—p. 721.
Lipoid Content of Fallopian Tubes During Menstrual Cycle and During Pregnancy. K. Joel.—p. 731.
Further Investigations on Induction of Uterine Hemorrhage by Means of Progesterone: Second Report. B. Zondek and S. Rozin.—p. 736.
Effects of Emotional Stress on Contractions of Human Uterus: Preliminary Report. E. M. Robertson.—p. 741.
Pregnancy in Uterus Containing Multiple Fibromyomas: Case. H. E. Murray.—p. 748.
Radium Treatment of Menopausal Hemorrhage, Followed by Carcinoma of Body of Uterus Three Years Later. S. G. Luker.—p. 753.
Two Unusual Cases of Ectopic Pregnancy. D. F. Anderson.—p. 756.

Maternal Age and Parity in Placenta Praevia.—Penrose studied the maternal histories of seventy-two cases of placenta praevia. The material collected, together with some additional data, has been analyzed in such a manner as to obtain information about the etiologic importance of maternal age and multiparity. The data suggest that increasing maternal age is a significant factor in producing the central type, though multiparity can be the chief cause in some marginal and lateral cases of placenta praevia. The expected mean maternal age at normal births is seen to be 29.1 years; the observed mean maternal age in all the cases of placenta praevia is 31.86 years. The difference between these two means is of highly significant value in the statistical sense: it is nearly four times the standard error, which is ± 0.71 years. With regard to multiparity the mean birth rank for placenta praevia was 3.55. This value was higher than that of expected normal births, 2.58. The difference of almost one rank between observed and expected values is statistically significant and is nearly as significant as the maternal age difference.

Pathology of Hyperemesis of Late Pregnancy.—In the course of routine work it became evident to Sheehan that the textbook descriptions of the pathologic lesions of hyperemesis or late vomiting were somewhat misleading. A study was made of the thirty-two patients who died and were examined post mortem within the last ten years, adequate histologic material having been preserved. The thirty-two patients died as a direct result of hyperemesis or of vomiting of late pregnancy, either before or within twenty-four hours after delivery. The author points out that the pathologic lesions found in these cases resulted from vomiting and an inadequate diet. There is evidence of loss of weight, but the body is usually not greatly emaciated. The heart is atrophied; the severity of this change is proportionate to the duration of the vomiting. The kidneys frequently show fat in the mitochondrial zone of the first convoluted tubules; this is dependent on acidosis during the last few days before death and is not present if adequate amounts of dextrose are administered during this time. The liver sometimes shows a fatty infiltration which may be centrilobular or, less commonly, periportal. This appears to be due to mobilization of body fat consequent on starvation. The brain, in patients who develop the terminal cerebral syndrome, shows the lesions of Wernicke's encephalopathy. Patients who die as a result of vomiting of late pregnancy do not have atrophy of the heart but otherwise show the same changes as in hyperemesis. In addition, evidence of the etiologic factor, such as pyclitis or hypertensive toxemia, is usually present. Patients who die in the early puerperium after these conditions may continue to show the same lesions that are found in the course of the disease. However, there may be additional changes due to the anesthetic or to puerperal sepsis. From the present investigation and from a study of the literature, it seems probable to the author

that all the cases of hyperemesis or late vomiting that have been reported as showing centrilobular necrosis of the liver were really cases of delayed chloroform poisoning. Certain of the other changes reported in the literature, such as necrosis of renal tubules, are only artefacts produced by postmortem autolysis. That the liver or kidneys may show any grade of the development of degeneration or necrosis out of the fatty change does not rest on any satisfactory foundation.

Etiology and Treatment of Hyperemesis Gravidarum.

—In discussing the pathogenesis of hyperemesis, Bandstrup sums up present knowledge by stating that, owing to some unknown cause, the woman begins to vomit. The further course of the illness may depend to a large extent on psychic factors. A state of inanition develops, of which want of glycogen in the liver is probably the most serious feature even though the want of salt, water and vitamins, together with the development of acidosis, is an important factor. A specific toxin of hyperemesis has never been demonstrated as a cause of the necrotic changes in the liver and other organs, and it is not inconceivable that these changes may develop as a result of the inanition under the special endocrine conditions present in pregnancy. In keeping with his view of the pathogenesis of this disease, his treatment consists of psychic, sedative and restorative therapy; if this is found inadequate pregnancy has to be interrupted. The psychic therapy consists of a firm suggestive management on the part of the physician and admission to a hospital, possibly with isolation of the patient. Sedatives, such as bromides and barbituric acid, have a calming effect on the mind of the patient and lower the irritability of the center for vomiting. The restorative therapy consists in the administration of dextrose, insulin, sodium chloride, water and vitamins. The future will show whether adrenal cortex extract is to be established as an effective remedy in the restorative therapy. If conservative treatment on these principles fails to lead to recovery, it may be necessary to induce abortion. Seven symptoms are considered as indications for interruption of pregnancy in hyperemesis. These symptoms include elevation of the temperature above 100.6 F. or persistent subfebrile temperature, persistent increase in the pulse rate over 100 a minute, jaundice, albuminuria, polyneuritis, ocular symptoms and psychotic changes. From a study of forty fatal cases of hyperemesis, twenty-five presented only one or more of the foregoing serious symptoms for more than one week prior to interruption of pregnancy or death. So the mere presence of one serious symptom has to be taken as a warning. All the patients were admitted to the hospital, even though a few of them did not enter the hospital till immediately before death. The treatment, as a rule, consisted of restorative and sedative treatment, besides therapeutic abortion in thirty of the forty cases.

Journal of Physiology, London

96: 109-232 (July) 1939. Partial Index

- Effect of Forced Breathing on Motor Chronaxia. B. Dijkstra and M. N. J. Dirken.—p. 109.
Effect of Clotting and of Addition of Histamine on Its Distribution in Blood. G. V. Anrep, G. S. Barsoum, M. Talaat and E. Wieninger.—p. 130.
Release of Histamine by Isolated Smooth Muscles. N. Ambache and G. S. Barsoum.—p. 139.
Rotatory Movements of Apex of Exposed Mammalian Heart. K. J. Franklin.—p. 164.
Changes in Elasticity of Mammalian Muscle Undergoing Rigor Mortis. E. C. B. Smith.—p. 176.
Nerve Excitation by High Frequency Alternating Current. B. Katz.—p. 202.

Lancet, London

2: 297-352 (Aug. 5) 1939

- Visceral Neuroses. J. A. Ryle.—p. 297.
*Encephalomyelitis Following Administration of Sulfanilamide. J. H. Fisher, with note on histologic findings by J. R. Gilmour.—p. 301.
*Local Tissue Anoxia and Its Treatment, with Special Reference to Rheumatic Myocarditis. E. P. Poulton.—p. 305.
Tests for Athletic Efficiency. A. Abrahams.—p. 309.
Biologic Effects of Synthetic Estrogen Hexestrol 4: 4'-Dihydroxy- γ : δ -Diphenyl-n-Hexane. N. R. Campbell, E. C. Dodds, W. Lawson and R. L. Noble.—p. 312.

Encephalomyelitis After Sulfanilamide.—Fisher cites two cases in which symptoms of encephalomyelitis appeared after the administration of small quantities of sulfanilamide. The total doses taken were small (14 and 18 Gm., respectively) and if the drug was responsible the patients must have been more

than ordinarily susceptible to it. There is evidence in patients suffering from certain illnesses—including acute rheumatic fever and lupus erythematosus—in which toxic manifestations after taking sulfanilamide are especially likely to develop. Vascular changes are seen in some cases of encephalomyelitis and their relation to the demyelinating lesions is discussed.

Tissue Anoxia and Its Treatment.—Poulton calls attention to the fact that the importance of local tissue anoxia and its treatment with oxygen has not been recognized heretofore, except that success has been claimed for oxygen therapy in varicose ulcer with local edema, poisoning with alcohol and coronary thrombosis. The inhalation of a high percentage of oxygen may have a wide application in treatment; its use in cerebral hemorrhage, thrombosis and embolism is suggested. The evidence that there is local anoxia in rheumatic myocarditis is a changed lactic acid metabolism and clinical improvement on treating patients with oxygen, resulting in a fall of temperature and pulse rate, alteration of murmurs, diminution in the size of the heart and electrocardiographic changes. Oxygen treatment in early cases appears to be of permanent benefit, but further observations are required. In seventeen of twenty-six rheumatic patients (fifteen in their first attack), treated with oxygen for periods varying from about a week up to eighty-two days clinical improvement was noticed. The patients felt better; they were more active and ate more and cyanosis disappeared; one could "breathe better." The improvement was most obvious of extremely ill patients, such as one with pericarditis, nephritis and purpura, who was so ill that oxygen had probably saved his life, another who had made but little recovery from a pericarditis and one with pneumonia and pericarditis. All these were children. Improvement was noticed whether the acute rheumatism was a first attack or accompanied by an old standing cardiac lesion. Adult patients also felt better. In eight cases there was no clear subjective improvement. A patient who had an enlarged cardiac shadow which indicated pericarditis did well in the tent, but the value of prolonged treatment was not realized as he was taken out of it after two days. Two and a half months later he was put in the tent for thirty-five days; there was massive edema, scanty urine and an enlarged liver; he died soon after being taken out of the tent. Hence oxygen should not be left till the last stages of rheumatic heart disease. A control series of sixteen cases observed over the same period tells a different story. In two cases in which there were systolic murmurs the cardiac condition cleared up in less than a month in one and in eleven weeks in the other. Another patient began with nodal rhythm, ventricular escape, and pre-systolic and systolic murmurs; after two months there were a systolic murmur and good first sound, and the pulmonary second sound reduplicated on inspiration. These three results are good. The results in the remaining thirteen are poor: in two cases soft systolic murmurs appeared and have persisted for nearly nine months in one and more than two months in the other, in two there were loud systolic murmurs and weak first sounds, in five middiastolic murmurs or their equivalents remained, in two there remained aortic diastolic murmurs and in two there was tachycardia, with a late blowing systolic in one.

2: 353-406 (Aug. 12) 1939

- Visceral Neuroses. J. A. Ryle.—p. 353.
*Response of Nutritional Macrocytic Anemia to Anahemin. H. Foy and Athena Kondi.—p. 360.
*Treatment of Epilepsy with Epanutin. D. Blair, K. C. Bailey and J. S. McGregor.—p. 363.
Epanutin in Epilepsy. J. P. Steel and E. S. Smith.—p. 367.
Idiosyncrasy to Acriflavine: Failure to Transmit by Blood Transfusion and Reactions to Allied Drugs. W. A. Young.—p. 369.
Acute Pancreatitis Caused by Barleycorn. F. Forty.—p. 370.

Anahemin for Nutritional Macrocytic Anemia.—Foy and Kondi find that the nutritional macrocytic anemia seen in Macedonia responds as readily to anahemin as to less purified liver extracts. This response is in contrast to the cases treated in India and suggests that the Macedonian cases differ from those in India, in which a high indirect van den Bergh reaction is rare. glossitis is common and the highly purified liver preparations are inactive. Such responses to these highly purified extracts make it appear unlikely that the filtrate factor of Edgar and Macrae is the active one in the cure of nutritional macrocytic anemia in Macedonia. Further, work done with the filtrate-factor concentrate shows that this, administered alone, is inactive

even when given in large doses. It is not impossible that the response to anahemin is quantitative and related to the liver content. It is active in 2 cc. doses and will probably be found active in smaller doses. Although the quantitative aspect is important, it is probable that the qualitative aspect also enters into the picture, for work now in progress seems to show that large amounts of filtrate combined with small amounts of anahemin are extremely active. This work suggests that the conclusions drawn by Wills and Evans (1938) and Napier (1939) do not apply to the nutritional macrocytic anemia of Macedonia as typical responses to anahemin were obtained. Further, the suggestion that there is some active principle present in the filtrate factor is not borne out by work with filtrate-factor concentrates, which do not produce any effect on the anemias in Macedonia. Such observations appear to bring back the position to that originally postulated by Castle.

Sodium Diphenyl Hydantoinate for Epilepsy.—Blair and his colleagues used sodium diphenyl hydantoinate in the treatment of fifty-three male and twenty-two female epileptic patients having grand mal attacks. Fifty-eight of the patients have been treated continuously for from two to six months, in eleven it was necessary to terminate treatment and six recently admitted patients have not yet received two months of treatment. The authors' results confirm those of Merritt and Putnam, that the drug is a strong anticonvulsant, its action sometimes being dramatic, but a weak depressant. Apart from the reduction in the number of fits, the drug was beneficial to the mental condition of many patients. In patients having chronic psychotic epilepsy there was little room for intellectual improvement, but a beneficial modification of the typical epileptic temperament was often observed. Most of the patients improved mentally, being more cheerful and congenial, less quarrelsome and complaining and more easily managed and occupied. In some cases the effect has been remarkable. Detrimental changes may, however, develop in association with toxic effects, and whenever a patient's mental condition appears worse, chronic poisoning should be suspected. Many patients exhibited toxic nervous symptoms, but a rash developed in only one. These toxic symptoms often developed after an increase in the dose.

2: 407-462 (Aug. 19) 1939

Visceral Neuroses. J. A. Ryle.—p. 407.

Transplantation of Ureters into Rectum by Mirotvortzeff's Method. S. P. Shilovtzeff.—p. 412.

Analysis of Normal P Wave. A. Hill.—p. 415.

*Malnutrition and Debility in Puerperal Psychoses. Norah A. Haworth.—p. 417.

*After-Effects of Exposure of Men to Carbon Dioxide. W. Alexander, P. Duff, J. B. S. Haldane, G. Ives and D. Renton.—p. 419.

Antitumorigenic Action of Progesterone. A. Lipschütz, R. Murillo and L. Vargas.—p. 420.

Amyloidosis Complicating Still's Disease. A. H. Imrie and Anne C. Aitkenhead.—p. 421.

Antipellagric Properties of Quinolinic Acid. R. W. Vilter and T. D. Spies.—p. 423.

Ayerza's Syndrome: Case. J. A. Brocklebank.—p. 423.

Malnutrition and Debility in Puerperal Psychoses.—

It is generally accepted that there is no specific form of mental disorder associated with childbirth and that when mental illness begins during pregnancy, the puerperium or lactation, childbirth may act as a precipitating factor. However, Haworth asserts that during childbirth there are certain points worthy of consideration. First the mental illness of pregnancy is often associated with some other contributory cause. Many of these women have already had one or more confinements and many of them pass normally through later confinements. This suggests that some other factor of a temporary nature is involved. The most important thing in the study of these contributory causes is the recognition of those which might be eliminated. Some, such as hereditary predisposition and lifelong nervous instability, cannot be removed, but a knowledge of their presence in the early days of pregnancy should suggest a special effort to build up the general powers of resistance and to eliminate additional preventable factors. Of the preventable contributory causes the author suggests that the two most important are (1) malnutrition and general debility and (2) stress and anxiety, emotional or environmental. The admittance of 117 cases of mental illness arising in connection with childbirth to Severalls Mental Hospital over a period of fifteen years shows how common these factors are. All but six patients were admitted dur-

ing the late months of pregnancy, during the puerperium or during lactation. In every case this was the first occasion on which the patient had been admitted to a mental hospital; seventy-two of the patients recovered, sixty had already had one or more normal confinements and twelve have had one or more confinements since their discharge from the hospital without developing any mental symptoms. Fifty-four of the sixty-eight women weighed on admission were below normal weight, twenty-eight being more than 14 pounds (6.4 Kg.) underweight. In every case except one, recovery was associated with an increase in weight. Only twenty-eight of the 117 patients were found to be in satisfactory general health when admitted to the hospital, none of these showing any sign of physical disorder. The majority were suffering from minor physical ailments, eighty had dirty, furred tongues and were and had been suffering from constipation, sixty had carious teeth or pyorrhea or both, thirty-two were suffering from anemia and, as has been shown, many were poorly nourished and underweight. A history taken in the early days of pregnancy would have shown that thirty-six of these patients belonged to families in which a near relative had suffered from insanity, epilepsy or alcoholism, twenty-nine had at some period in their life already shown signs of nervous instability, while twenty-two had undergone long and severe stress. Therefore it seems that many instances of puerperal psychosis could probably be prevented by attention to nutrition, general health and environmental conditions early in pregnancy.

After-Effects of Exposure to Carbon Dioxide.—According to Alexander and his co-workers, after breathing air with a partial pressure of more than 6 per cent of carbon dioxide for an hour or longer, five of six men experienced headache on breathing oxygen and two of them vomited. The bearing of this observation on escape from submarines is discussed and it is suggested that in such circumstances men should breathe air or oxygen for thirty minutes or more before attempting to use the escape apparatus, because under these circumstances vomiting would prove fatal and calmness and some physical exertion are required.

Medical Journal of Australia, Sydney

2: 193-234 (Aug. 5) 1939

*Study of Heterologous Antibodies in Serum of Poliomyelitis Patients. F. M. Burnet, Mavis Freeman, A. V. Jackson and Dora Lush.—p. 198.

Some Common Problems in Everyday Prescribing. B. L. Stanton.—p. 206.

Note on Occurrence of Cimex Hemiptera in Nauru, Central Pacific. L. A. Windsor-McLean.—p. 211.

2: 235-266 (Aug. 12) 1939

Chemical Estimation of Vitamin C, with Analyses Made on Some Queensland Products. E. L. Leggett and Kathleen W. Robinson.—p. 241.

Public Health: Health Work in Country Centers. C. T. Piper.—p. 244.

Heterologous Antibodies in Poliomyelitis Serum.—

Burnet and his associates postulated that poliomyelitis in human beings is strictly confined to the central nervous system and that extremely little antigen reaches any part of the antibody-producing mechanism. If this is so, poliomyelitis antibody must be either the response to another antigen having determinant groups in common with poliomyelitis virus or a change in the serum globulin content, associated with increasing age or increasing experience, or both, of a variety of antigenic stimuli. To come to a decision between these alternatives, they investigated a series of samples of serum from seventy patients with poliomyelitis for their content of four antibodies in addition to poliomyelitis antibody: diphtheria antitoxin, herpes simplex virus, swine influenza antibody, which was included because of its curious behavior in relation to age (it appears only in individuals more than 10 years of age), and staphylococcus α antitoxin. The results have been analyzed according to age and social environment and compared with those from control groups. There is no different proportion of any of the heterologous antibodies in these specimens of serum than would be found in a comparable group of normal serum specimens. Herpes simplex antibody and diphtheria antitoxin are both much more frequently found in children from crowded industrial suburbs than in those from better class areas. In the industrial areas herpes infection is contracted before the age of 2 years, while diphtheria antitoxin appears as a rule only after the child has begun to attend school.

There is no association between the frequency of swine influenza antibody or staphylococcus antitoxin in serum and the nature of the social environment. There is a significant correlation between the presence of poliomyelitis antibody and diphtheria antitoxin in young children from industrial suburbs; this suggests that the two antibodies are acquired at about the same age and under similar environmental conditions.

Practitioner, London

143: 129-236 (Aug.) 1939

- Venereal Diseases and the General Practitioner. L. W. Harrison.—p. 129.
Treatment of Early Syphilis. R. Lees.—p. 134.
Treatment of Late Syphilis. T. Anwyl-Davies.—p. 146.
Treatment of Gonorrhea in the Female and of Vulvovaginitis in Little Girls. Gladys M. Sandes.—p. 157.
Treatment of Gonorrhea and Chancroid in the Male. H. M. Hanschell.—p. 165.
Treatment of Lymphopathia Venereum. H. S. Stannus.—p. 172.
Medicolegal Aspects of Venereal Disease. D. H. Kitchin.—p. 177.
Sterility in the Female. H. Taylor.—p. 185.
The General Practitioner and Psychoanalysis. J. Rickman.—p. 192.
Abdominal Pain in Young Children. V. Smallpeice.—p. 199.
Use and Abuse of Local Applications in Treatment of Skin Disease. E. W. P. Thomas.—p. 209.
Modern Therapeutics: II. Therapeutics of Iron. J. C. Hawksley.—p. 215.

South African Medical Journal, Cape Town

13: 535-586 (Aug. 12) 1939

- History of Medicine. T. P. Oates.—p. 543.
Psychologic Factor in Disease: I. The Physician. C. D. Brink.—p. 550.
Id.: II. The Surgeon. J. A. Douglas.—p. 559.
Id.: III. The Psychiatrist's Point of View. W. Russell.—p. 562.
Id.: IV. The General Practitioner's Point of View. B. Walker.—p. 566.

Tubercle, London

20: 445-484 (July) 1939

- Tuberculosis of Chest Wall. N. R. Barrett.—p. 445.
Apical Origin of Phthisis. S. Puder.—p. 460.
Observation on Healing of Tuberculous Cavities: Case Report and Comparison. G. A. M. Hall.—p. 468.

Tohoku Journal of Experimental Medicine, Sendai

26: 103-298 (July) 1939. Partial Index

- Elimination of Sodium Chloride by Isolated Kidney (Normal or Diseased) in Perfusion with Hypotonic Solution of Sodium Chloride. M. Izumida.—p. 103.
Action of Berberine on Circulation. S. Suzuki.—p. 134.
Action of Arginase of Digestive Juices and of Pancreas. M. Kaiju.—p. 153.
Formation of Glycogen from Fats, Particularly Fatty Acids, Under Action of Epinephrine. K. Sanzyo.—p. 159.
Action of Vitamin C and of Related Substances on Glycogen Content. K. Terada.—p. 180.
Acetone Content of Urine in Pulmonary Tuberculosis. K. Yamazaki.—p. 236.

Acetone of Urine in Pulmonary Tuberculosis.—Yamazaki decided to investigate the disturbances in the carbohydrate and fat metabolism of patients with pulmonary tuberculosis. He determined the elimination of acetone in the urine and compared it with that of healthy persons; he also studied the changes in the acetone content of the urine following tolerance tests with fat. The studies were made on 101 patients with pulmonary tuberculosis and on six healthy persons. He found that with healthy persons the urinary elimination of acetone averages 12 mg. daily. In cases of pulmonary tuberculosis it was higher, the daily average being 16.87 mg. On the whole, the acetone value was the higher, the more severe was the tuberculous process; that is, there was a parallelism between the type and stage of the disease and the urinary elimination of acetone. A comparison of the acetone values in the cases in which a diet with a high fat content was administered with those in cases in which such a diet was not given disclosed higher values in the first group. In cases in which glycosuria developed following the intake of large quantities of fat the acetone values were extremely high. Fat tolerance tests of healthy persons increased the acetone content of the urine on the average by 12.7 per cent; fat tolerance tests of patients with pulmonary tuberculosis and glycosuria produced an increase of 34.2 per cent. The author further shows that in cases of pulmonary tuberculosis the increase in the acetone content goes parallel with the height of the temperature and with the sedimentation speed of the erythrocytes.

Bruxelles-Médical, Brussels

19: 1235-1265 (Aug. 6) 1939

- *Management of Labor and Prognosis for Child in Breech Presentation in Old Primiparas. J. Snoeck and R. Canon.—p. 1235.

19: 1266-1296 (Aug. 13) 1939

- Cutaneous Immunizations in Eczema. Gougerot.—p. 1266.
*Management of Labor and Prognosis for Child in Breech Presentation in Old Primiparas. J. Snoeck and R. Canon.—p. 1272.

Breech Presentation in Old Primiparas.—Snoeck and Canon show that the opinions regarding the prognosis of breech presentation in old primiparas and regarding the management of such cases differ greatly. They reexamined this problem on the basis of observations made in the years 1927 to 1938 at the maternity clinic of the University of Brussels. They present two series of eleven cases each. In one group of eleven cases the so-called classic methods were employed and the results for the fetuses were disastrous, the fetal mortality being seven. In the second series of eleven cases of breech presentation in old primiparas, the method of treatment was the low cesarean operation. In all these cases mother and child were entirely well when they were discharged from the clinic. On the basis of the comparison of the results obtained in these two series of cases, the authors conclude that the low cesarean operation is indicated in "dystocic" breech presentation of primiparas over 30 years of age. They list the conditions which signify "dystocic" breech presentation in an old primipara and which indicate cesarean operation as follows: (1) all breech presentations combined with narrow pelvis in which the true conjugate diameter measures less than 10.5 cm. so far as the presentation remains mobile within the limits of time specified later; (2) all breech presentations, whatever the true conjugate diameter may measure, which do not become engaged during the first ten to fifteen hours of labor, and this without taking account of the time of rupture of the bag of waters; (3) all breech presentations which are engaged before this lapse of time and in which the progression is slow or null in spite of two or three hours of good uterine contractions; (4) all breech presentations with anomalies of the uterine contractility or of the dilatation of the cervix, when these do not yield rapidly to energetic medical treatment. The authors think that all old primiparas should be delivered in an obstetric clinic. Regarding the technic of the treatment, they say that the low cesarean operation must be entirely segmental and not corporeal or corporeosegmental. They think that the transverse section of the muscular layer of the inferior segment is the only technic which guarantees the integrity of the body of the uterus in case of further tearing of the surgical incision.

Presse Médicale, Paris

47: 1261-1276 (Aug. 19) 1939

- Amebiasis Not Recognized in France. M. Chiray and P. Chiere.—p. 1261.
*Covered Perforation of Gastric and Duodenal Ulcer. H. Gjankovic.—p. 1263.

Covered Perforation of Gastric Ulcer.—Following a review of the literature on closed perforations of gastric and duodenal ulcers, Gjankovic discusses the clinical aspects of these types of perforations and gives rules regarding their treatment. In the second part of the paper he describes his personal observations. Among 109 cases of perforated gastroduodenal ulcers treated by him he encountered thirteen perforations that were covered (11.92 per cent). All except one of these covered perforations concerned duodenal ulcers, which indicates that covered perforations are much more frequent in duodenal than in gastric ulcers, even if the higher incidence of duodenal ulcers (sixty-nine of the 109) is taken into consideration. The author thinks that the prognosis of covered perforations is generally favorable but is doubtful until definite cure is established. Although spontaneous cure is possible, surgical treatment is indicated in all cases. If the perforation is recent it is necessary to operate immediately, except that the indication should be ruled by the clinical syndrome, the stage of the disease and the condition of the patient. Of the various surgical methods the resection is always indicated in the covered perforation of gastric and duodenal ulcer if there is no general contraindication. If on the other hand there is one, it is necessary to limit the operation, according to the nature of the contraindication, to a suture (if this is practical) with primary suture of the abdominal

wall. Conservative therapy is permitted only in a clinic, where permanent and competent control is possible. The circumscribed secondary abscesses with localized peritonitis should be opened and drained immediately under strictly aseptic conditions. The sutures of the covered perforations of the stomach and duodenum as well as anterior or posterior gastro-entero-anastomosis give the best permanent results in 75 per cent of the cases. The same results can be obtained by resection. The latter has advantages, because it readily and probably forever excludes late complications which may develop subsequently with the conservative operations. Therefore resection is advisable in all cases of covered perforation except for certain contraindications.

Giornale di Clinica Medica, Parma

20: 1023-1126 (Aug. 10) 1939. Partial Index

*Function of Bone Marrow in Nephritis. B. Nolli.—p. 1023.

Tables with Clinicolumbar Dissociation: Histopathologic Study of Case G. Fattovich.—p. 1050.

Calcification of Nucleus Pulposus: Cases. L. Pinelli.—p. 1073.

Bone Marrow in Nephritis.—Nolli says that early in the development of nephritis a myelopathy develops which causes nephritic anemia. The author studied the functions of the bone marrow in eighteen cases of nephritis of various types and at different evolutionary stages. The observations were made on medullary blood which was taken by sternal puncture. The author found that the changes of the myelogram, of the leuko-erythropoietic ratio in the myelogram and of the curves of maturation of the stem blood cells of both the erythroblastic and the leukoblastic series, in renal sclerosis with anemia from old age, are those which correspond to hypoplasia of the bone marrow. In acute diffuse glomerulitis as well as in acute hemorrhagic glomerulitis with anemia the medullary alterations are of the type of those which are observable in acute and subacute forms of posthemorrhagic anemia. However, erythrocytes in the peripheral blood show morphologic alterations which are characteristic of nephritis. In diffuse chronic renal inflammation the hematopoietic functions (output of stem cells) are diminished. The leuko-erythropoietic ratio in the myelogram is disturbed with predominance of either myeloblasts or erythroblasts from uneven formation of the cells, the curves of maturation of the cells are increased, mitosis is diminished and the medullary threshold for passage of mature cells to the blood is increased. The myelopathy causes typical alterations to the peripheral blood with morphologic changes of the erythrocytes and diminution of their number. Its evolution parallels that of the renal disease and it progresses to aplasia of the bone marrow. Administration of a combined treatment of arsenicals, iron and liver extract, early in the development of the renal disease, controls the functional disorders of the bone marrow with consequent control of the morphologic changes of the blood cells. The medullary alterations of nephritic myelopathy are different from those which are seen in the various forms of myelopathy in secondary anemia of toxic or infectious origin. They are also different from those which develop in anemia from insufficient supply of minerals in the diet and from pernicious anemia. In the terminal stages of the renal disease as well as in true uremia the bone marrow is transformed into a gelatinous yellow material which does not contain any active red marrow.

Arch. Urug. de Med. Cir. y Especialid., Montevideo

14: 513-640 (June) 1939. Partial Index

*Neurolymphogranulomatous Syndromes. J. C. Plá, A. Pérez Sánchez and J. Pereira Granotich.—p. 513.

Modifications of Elbow and Madelung's Deformity. R. A. Piaggio Blanco and F. García Capurro.—p. 532.

Surgical Treatment of Acute Infections of Fingers and Hands. E. Andreón.—p. 567.

Neurolymphogranulomatous Syndromes.—Plá and his collaborators say that malignant lymphogranulomatosis may cause various types of nervous syndromes from compression of the lateral columns of the spinal cord, the brain or the nerve roots by lymphogranulomatous lymph nodes or their metastases. Certain nervous syndromes may also be observed in absence of nervous compression. The authors report two cases. In the first case a syndrome of diffuse meningo-radicular neuritis developed in the course of the disease with paralysis of the sixth nerve, oculosympathetic paralysis (Horner's syndrome) and radicular sciatic pain. In the second case, also in the course of the disease, a form of progressive bilateral muscular atrophy

of the extremities developed. In both cases the Wassermann reaction of the blood and cerebrospinal fluid was negative, there were no symptoms of tumors or tumoral compression at the brain or the spinal cord, and the cerebrospinal fluid, taken by spinal puncture, showed the presence of a meningeal reaction of irritation. In the second case paralysis and sensory disturbances did not exist and the iodized poppyseed oil did not stop after having been injected by the suboccipital and lumbar routes in the Trendelenburg position. The authors conclude that in both cases the nervous symptoms were caused by the lymphogranulomatous virus, which was located at the meninges and various nerve roots in the first case and at the lateral columns of the spinal cord in the second case. The development of nervous syndromes in malignant lymphogranuloma in the absence of nervous compression prove, according to the authors, the existence of lymphogranulomatous virus, although it has not yet been identified.

Klinische Wochenschrift, Berlin

18: 949-980 (July 15) 1939. Partial Index

Regulatory Processes in Organism in Oxygen Deficiency. G. Zaepfel.—p. 949.

*Functional Tests of Liver in Treatment with Sulfanilamide Preparation. W. Schmidt.—p. 953.

Anaphylactic Shock During Various Degrees of Saturation with Vitamin C. F. Diehl.—p. 956.

Changes in Blood in Hemophilia. Else Heyl.—p. 960.

Does Human Placenta Contain Cholin Esterase?—p. 963.

Alcapton, Acetone and Carbohydrate Deficiency. C. Jimenez Diaz, H.

Castro Mendoza and J. Sánchez Rodríguez.—p. 965.

Significance of Bile for Resorption and Elimination of Ullron (Sulfanilamide). W. Lutz.—p. 967.

Hepatic Function During Sulfanilamide Therapy.

According to Schmidt, the administration of chemotherapeutic substances taxes the intermediate metabolism and particularly the liver. He also raises the question as to which toxin is more likely to cause damage, that of the infection or that of the chemotherapeutic substance. In this connection he cites observers who described cases of gonotoxic icterus and then describes his own studies on the hepatic function of gonorrheal patients who underwent treatment with sulfanilamide. In twenty-nine cases he tested the hepatic function before, during and after the administration of sulfanilamide by means of the galactose tolerance test according to R. Bauer; simultaneously he observed the blood sugar curve and examined the urine for urobilinogen, tyrosine and leucine. He found that the functional examination of the liver of patients with gonorrhea often revealed pathologic values, before treatment with sulfanilamide was instituted, and that the administration of sulfanilamide nearly always exerted a favorable influence on the hepatic function. In cases in which the hepatic function was normal before the administration of sulfanilamide, no damage was observed after this medication. Moreover, gonotoxic icterus rapidly disappeared under the influence of sulfanilamide. A comparatively large dose of sulfanilamide (63 Gm.) caused no hepatic impairment in the author himself. In two cases of severe intoxication with a nitrosulfanilamide body, the test of the hepatic function disclosed no impairment of the hepatic parenchyma. Chemotherapy by means of sulfanilamide preparations never resulted in urobilinogenuria, nor were tyrosine and leucine ever detected in the urinary sediment during or after the sulfanilamide treatment. The author concludes that these results demonstrate the indifferent behavior of the examined sulfanilamide bodies toward the hepatic parenchyma.

Zeitschrift für Orthopädie, Stuttgart

69: 377-512 (Aug. 4) 1939. Partial Index

*Surgical Results in Congenital Muscular Torticollis. Koch.—p. 394.

Rare Form of Curvature of Forearm. E. Koptis.—p. 402.

Spontaneous Cure of Congenital Dislocation of Hip Joint. F. Drehmann.—p. 410.

Defective Form of Pelvis in Osteogenesis Imperfecta. E. Heidsieck.—p. 429.

*Surgical Treatment of Severe Static Flatfoot. A. Pavlik.—p. 439.

Roentgenogram of Foot. E. Güntz.—p. 445.

Normal Foot and Its Relation to Shoe. Margarete Schmidt-Schütt.—p. 476.

Surgical Treatment in Congenital Muscular Torticollis.

—Koch considers in this report only cases of true congenital muscular torticollis, disregarding the cases of torticollis resulting from primary bone changes and also those mild cases of torticollis in which exercise and massage counteract the slight contraction of the sternocleidomastoid muscle. Regarding the

surgical technic employed at his clinic, he says that a cutaneous incision 2 cm. in length (usually longitudinal) is made above the lower end of the sternocleidomastoid muscle. Then follows exposure and division of the sternal and clavicular heads of the muscle and division of the surrounding fascia, also detachment of all shortened fascial strands. In a few cases from 1 to 1.5 cm. of the muscle is removed. Following arrest of hemorrhage and cutaneous suture, Schanz's absorbent cotton bandage is applied and the patient's head is fixed in a position which overcorrects the deformity. The bandage is renewed after eight and twenty-four days, and after an additional three weeks the last bandage is removed and then passive exercises and massage are begun, which are continued for from six to twelve months or longer. In order to obtain information about the efficacy of this method, the author made inquiries regarding 117 patients who received this treatment during the years between 1930 and 1937 inclusive. Information was obtainable from 108 of these patients. At the time of operation the patients varied in age between 4 months and 18 years. In 61 per cent of the patients the operation was performed during the first two years of life. Summarizing the results, the author says that in eighty-six cases the results were good, in twenty-one cases were unsatisfactory and in one case were bad. He emphasizes that the best results were obtained in those cases in which the operation was performed during the first two years of life.

Surgical Treatment of Severe Static Flatfoot.—Pavlik says that the severest forms of flatfoot, which are characterized by curvature of the leg, especially in the distal portion just above the ankle joint, and which present subluxation in the talonavicular joint, abduction of the anterior part of the foot, valgus position of the heel and contracture of the extensors, of the peroneal muscles and of the achilles tendon, require surgical treatment because conservative treatment fails to produce the desired results. The author describes three different types of surgical treatment which are designed to correct the various forms of flatfoot. He shows that it is necessary to select that type of surgical method which, on the one hand, reconstructs the arch of the foot and, on the other hand, counteracts the curvature of the lower part of the leg, which is the essential cause of the collapse of the arch of the foot and of the subluxation in the tarsal joints. If the curvature in the leg is removed, the crural skeleton becomes shorter and the muscular contracture, which together with the arthrosis deformans-like changes in the talonavicular joint causes the deformity of the foot, subsides. The author resects the talonavicular joint by removing the cartilage and the arthrosis deformans-like changes from the head of the talus. By osteotomy of the bones of the leg he overcomes the curvature and by suitable wedge-shaped osteotomy of the tibia causes the reposition of the subluxation in the talonavicular joint to become possible.

Acta Medica Scandinavica, Stockholm

101: 1-103 (Aug. 1) 1939

Clinical Investigation in Spring of 1938 of Cases of Sciatica Observed During Years 1933 and 1934. S. Ekvall.—p. 1.

Exogastric Fibroma with Gastrointestinal Hemorrhages. E. Filo and F. Šubík.—p. 34.

Studies on Ascorbic Acid by Means of the Photograph. T. Gulhe and K. K. Nygaard.—p. 40.

Familial and Hereditary Hyposomia and Vitiligo: Importance of Pituitary Factor in Cutaneous Dyschromias. M. Cahane and T. Cahane.—p. 62.

*Resistance and Immunity in Tuberculosis. L. Ascher.—p. 71.

*Iodine Therapy in Hypertension and Arteriosclerosis. N. Alwall.—p. 83.

Resistance and Immunity in Tuberculosis.—Ascher directs attention to the age law of natural, internal resistance, which was formulated by him many years ago. According to this law the general, internal and natural resistance increases from infancy to school age, reaching its maximum between the ages of 5 and 15 years, and then it decreases with advancing age. The author cites statistical reports on tuberculosis from different countries. He points out that unfavorable nutrition increases the mortality from tuberculosis, whereas reduction in industrial activity reduces the mortality rate from tuberculosis. It has been demonstrated that in times of economic crisis, with unemployment, the mortality from tuberculosis decreased further than it did during times of prosperity and employment. Moreover, this decrease in mortality was limited to the employed age groups, whereas in children there was a slight

increase in mortality. The author further gives his attention to immunity and says that in some large cities 100 per cent of the adults give a positive Pirquet reaction. Approximately 0.5 per cent of these develop tuberculosis annually; that is, 0.5 per cent of the immune persons develop the disease, not 0.5 per cent of the infected ones. The author emphasizes that the activity of the tubercle bacillus is limited by the natural internal resistance of the human organism and by the immunity produced by the bacillus itself. However, resistance and immunity are subject to impairment and consequently are not always complete. Factors which play a part in this impairment are nutrition, exertion and exposure. After discussing these, the author says that the reduction of the tuberculosis mortality hitherto has been examined only from the point of view of medical and social measures. He shows that spontaneous, that is, endemically acquired, immunity is the main factor, at least in regions where and in times when no measures are taken against tuberculosis, and when its mortality has been known to decrease more than at times when measures were taken against it. The comparative freedom of children of school age from tuberculous manifestations in the presence of slight individual infection, but of approximately 50 per cent positive Pirquet reactions, indicates adequate immunity in the concurrence of highest resistance with small quantities of infectious agent. There is the possibility of improving the immunity by BCG. Since it is possible that the time may come when the population will not acquire an adequate immunity in the spontaneous manner, immunizatory measures, as in the case of smallpox, might have to be employed.

Iodine Therapy in Hypertension and Arteriosclerosis.—Alwall points out that iodine is widely recommended in the treatment of vascular diseases, particularly arteriosclerosis and hypertension. The generally accepted opinion is that iodine reduces the viscosity of the blood and consequently the resistance to the current, thus facilitating the circulation. This opinion was supported by earlier experiments, which demonstrated that the viscosity of the whole blood decreases under the influence of iodine therapy. More recent experiments demonstrated, however, that the viscosity of the plasma and not the viscosity of the whole blood determines the resistance to the blood current. For this reason the author reports his investigations on the question whether the viscosity of the plasma is influenced by iodine therapy. He examined the plasma of healthy persons and of persons with hypertension by means of Hess's viscosimeter. He made these tests before iodine therapy was instituted and after it had been continued for shorter or longer periods. The iodine therapy was found to produce no changes in the viscosity of the plasma and the author thinks that this contradicts the old theory that iodine therapy reduces the resistance to the blood current by lessening the viscosity and thus facilitating the circulation. He suggests that there must be another explanation for a possible favorable action of iodine therapy on arteriosclerosis and hypertension.

Ugeskrift for Læger, Copenhagen

101: 819-842 (July 13) 1939

Witchcraft in Pregnancy and Delivery: Chapter from History of Popular Medicine. J. S. Möller.—p. 819.

Manifest Hemorrhage Due to Ulcer in Aarhus from 1918 to 1937.

A. Guldager and F. Heintzelmann.—p. 826.

Method for Determination of Coagulation Time of Blood: Preliminary Report. M. Andreassen.—p. 831.

*Mortality of Lupus Vulgaris Patients and Cause of Death. C. X. S. Gundtoft.—p. 832.

Cause of Death in Lupus Vulgaris.—Gundtoft studied the cause of death in 211 cases of lupus vulgaris (sixty-five men, 145 women) treated at the Finsen Institute during the last twenty-five years. Only three patients, all advanced in age, died from lupus itself, sixty-one (twenty-one men, forty women) died from pulmonary tuberculosis, four men and seven women died from tuberculous meningitis, nine men and seven women died from tuberculous diseases other than those mentioned and about half the patients died from causes not connected with tuberculosis. Lupus vulgaris is, thus regarded as a benign disease but one which calls for careful examination as to the possible coexistence of tuberculous processes elsewhere.

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THE TREATMENT OF RETRODISPLACEMENTS OF THE UTERUS

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The term retrodisplacement is used clinically to include both retroversion and retroflexion, although literally it implies a backward dislocation of the uterus irrespective of its relation to the vertical plane of the pelvis. A retroflexion differs from a version only in the break in alinement at the cervicocorporeal junction, and a distinction between the two is of only academic interest. Both alterations in position may be congenital or acquired; neither causes symptoms per se, and their treatment is identical. Retroversionflexions complicated by prolapse in the axis of the vagina constitute a separate problem and are not under consideration.

Congenital displacements are identified in most cases by the foreshortened anterior cervical lip and anterior vaginal fornix, a general hypoplasia of the internal pelvic organs, and the limited mobility of the uterus despite the absence of restraint from adnexal inflammatory involvements. They are frequently associated with endocrine derangements and discovered incidentally in young women who present themselves because of dysmenorrhea, menstrual irregularities or sterility. Such patients seldom complain of sacral backache, the chief symptom attributed to a retrodisplacement. On the other hand, in cases in which the lesion is acquired as a sequel of abortion or labor the symptoms commonly ascribed to the malposition do not appear until after the lapse of considerable time. Hence it is logical to assume that uncomplicated retrodisplacements do not produce symptoms; if they did, there would be a simultaneous symptomatic onset with the backward dislocation, and all patients with defects which have existed since birth would have sacral backache, leukorrhea or other local annoyances. The factors responsible for normal uterine poise and position are the dynamics of the intra-abdominal pressure exerted against the posterior surface of the corpus, the tonicity of the supporting ligaments and the integrity of the perineal musculature. Impairment of any or all of them may eventuate in an acquired retrodisplacement. When one sees patients with displacements that might have been prevented, ill fitting pessaries inserted upside down or back to the front or both, operations performed with failure to relieve symptoms notwithstanding a satisfactory anatomic end result, and recurrences after

laparotomy, it is evident that the subject under discussion has not yet been worn threadbare. It therefore seems pertinent to emphasize the importance of differential diagnosis, to clarify the treatment indicated for various cases, to stress the therapeutic value of the much abused and often neglected pessary and to consider a few effective surgical procedures for patients in whom operation is really indicated.

Having recognized a retrodisplacement, it then becomes important for one to ascertain whether the malposition is congenital or acquired, whether the uterus is replaceable or immobilized and whether or not there is coexisting endocervicitis, parametritis, peri-uterine fixation, adnexal disease or pelvic tumor. All of these modifications have a direct bearing on subsequent treatment. Developmental defects require no corrective therapy. A replaceable uterus may be treated expectantly, with a pessary or by operation. Immobilization is usually due to associated pathologic conditions but is occasionally caused by the incarceration of a large corpus beneath the promontory of the sacrum. If, despite the absence of adnexal disease or pelvic adhesions, bimanual reposition is impossible with the patient in the lithotomy position, it can sometimes be accomplished by a change to the knee-chest position. Instrumental repositors are unnecessary and dangerous. A freely mobile retrodisplacement is often erroneously regarded as uncomplicated simply because no grossly apparent complications can be detected, although there may be intense concomitant passive congestion. In fact, it is the insidious onset of circulatory stasis, particularly in the broad ligament veins, that is responsible for the delayed and gradual appearance of symptoms in the majority of cases. With the uterus in normal position, the uterine and ovarian vessels are widely patent; when retroversion occurs, lateral torsion on their longitudinal axis with consequent narrowing of their caliber is inevitable. As the vascular engorgement increases, the walls of the veins weaken to such an extent that actual varicosities may be seen at the operating table. This is the explanation for the paradoxical initiation of symptoms in cases of "uncomplicated," or easily replaceable, retrodisplacement.

Of the many complaints credited to retrodisplacement only three, sacral backache, a sense of pelvic heaviness and leukorrhea, are apt to be manifestations of the malposition itself. There are so many additional causes of these, as well as of the other pelvic complaints sometimes ascribed to the retroversion, that the mere existence of a displacement by no means justifies the assumption of direct cause and effect. In many instances the cause will be found elsewhere (table 1).

If a sacral backache can be relieved by such measures as unloading an obstipated colon, treatment of posterior parametritis, fitting flat feet with suitable plates, cradi-

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cation of remote foci of infection and orthopedic treatment to remedy abnormalities in the lower part of the spine even though a displacement persists, the time to discover this is before a futile laparotomy and not afterward. In other words, the major problem is not the recognition of a retrodisplacement but the differential diagnosis of the true source of the symptoms attributed to it.

A retrodisplacement may be treated prophylactically, expectantly, palliatively or surgically. Proper precautionary measures following abortion, labor and vaginal operations involving traction on the cervix will prevent many acquired malpositions. After therapeutic abortion, packing the uterus with iodoform gauze for forty-eight hours and administration of 1 cc. of solution of posterior pituitary twice daily for three days will hasten involution. After delivery, perineal lacerations should be repaired immediately to restore the integrity of the perineal musculature. Elevation of the patient's shoulders on the second day promotes free lochial drainage. Assuming the prone position for five or ten minutes several times each subsequent day facilitates forward gravitation of the uterus and exertion of the intra-abdominal pressure on the proper fundal area. Deep breathing exercises in the knee-chest position during the third and fourth postpartum weeks help to prevent diastasis of the abdominal muscles and also tend to throw the corpus forward.

TABLE 1.—Symptoms Often Attributed to Retrodisplacements of the Uterus

Symptom	Usual Cause
Sacral backache	Overloaded sigmoid and rectum, posterior parametritis, flat feet, focal infection, sacro-iliac joint, low spinal abnormalities
Menorrhagia	Passive congestion, endometrial alterations, tumors
Leukorrhea	Endocervicitis, endometrial hyperplasia, trichomonas vaginitis
Pain	Inflammatory products in the pelvic structures
Pelvic dragging	Cystocele, rectocele, subinvolution
Dyspareunia	Uterine or adnexal fixation, prolapse of ovaries
Repeated abortion	Incarceration, constitutional disease, endocrine dysfunction
Sterility	Husband, tubal disease, endocrine derangements, endocervicitis

Regular and continued breast feedings reflexly stimulate pelvic involution and should be urged for this as well as other reasons. If all patients are reexamined three, six and twelve weeks after abortion or parturition, retrodisplacements will be detected promptly. It is axiomatic that the farther back the cervix, the farther forward the corpus. Hence the importance of replacing the uterus bimanually and holding the cervix back in the pelvis with a strip gauze vaginal pack, pressed firmly against the portio, after operations such as curettage and trachelorrhaphy, which necessitate pulling the uterus into the vaginal plane.

In addition to congenital displacements which can be safely ignored, some freely mobile retroversions of long standing are found to be symptomless and to require no treatment. Under these circumstances it is wise to request the patient to return for semiannual examinations. On the other hand, if such a displacement is of recent origin, one year or less, the uterus should be held in its normal position for several months with a pessary and not treated expectantly, because the supporting structures may still be capable of regaining their tonicity.

Palliative therapy resolves itself into the application of a pessary in cases of replaceable retrodisplacement, and the treatment of coexisting parametritis and adnexal disease when the uterus is thereby immobilized. The induction of local depletion and hyperemia by such means as strip gauze and glycerin vaginal packing, hot saline douches, sitz baths, diathermy and short wave therapy will oftentimes convert a fixed displacement into one that is replaceable. When the malposition is discovered early it can be corrected with an excellent prospect of a nonoperative cure; in other cases relief is experienced only so long as the pessary is worn. There are four types of pessary well adapted to the treatment of retroversion under slightly different conditions: the Hodge, the Albert Smith, the Thomas and the Findley, of which the Smith is the most popular. The purpose of a pessary is not to correct a displacement but to maintain proper uterine poise after the uterus has been replaced. Incidentally, it serves to demonstrate that permanent anteversion will relieve the symptoms. Certain prerequisites are essential: The bladder should be emptied by catheter, the mobile uterus must be replaced bimanually, there must be no associated prolapse or extensive cystocele, and before an appliance is selected for an individual patient the size and configuration of the vagina should be estimated. The length is determined by inserting the fingers high in the posterior fornix, just as though measuring the diagonal conjugate diameter of the pelvis. The approximate width is estimated by separating the finger tips at the midportion of the vagina. It is thus easy to select a pessary of the size and shape that the patient needs. Misused, misfitted and misapplied pessaries will cause distress and local soreness, whereas one that is fitted accurately can be worn with perfect comfort, if it is removed, cleaned and replaced every six weeks. Every curve in a pessary is designed for a definite reason, and once the principles of construction are understood there is no difficulty in making a selection for an individual patient.

The uterus having been replaced in its normal position, the only thing necessary to keep it there is some mechanical contrivance to hold the cervix back. If two fixed points, the pubic arch and the posterior vaginal fornix, are kept widely separated by a rigid bar or straight stick, the cervix can move up and down through a small arc but cannot come any nearer the vaginal orifice. If a straight stick were used; however, the posterior tip would push sharply into the fornix, so the end must be bent upward to conform to the outline of the fornix and put the uterosacral ligaments on the stretch. Provision having been made for the curve of the vaginal vault, it becomes necessary to make a shorter reverse curve in the anterior end, to allow for the upward pressure of the perineal musculature. This long upward curve permits the pessary to lie up out of the way in the narrow part of the pubic arch. Since the vagina is a wide canal, it is necessary to place another stick with identical curves parallel with the first and to connect the two anteriorly and posteriorly. The posterior bar is wider because the fornix is roomy, the anterior bar narrower so that it can lie well up behind the pubic arch. The little transverse notch and downward dip at the anterior end are to prevent undue pressure on the overlying urethra.

Laparotomy for the correction of displaced uterus is an elective and not an emergent procedure, and it should not be advised unless the hazards involved are minimal, all palliative measures have been exhausted and subse-

quent pelvic comfort can be anticipated. An operation which fails to afford symptomatic relief is a failure, irrespective of the anatomic result.

In a series of 3,400 consecutive office patients, a retrodisplacement was found 429 times, an incidence of about 12.5 per cent. Of these, forty-two patients failed to return for treatment and have been disregarded in this analysis; seventy-two of the remainder had congenital and 315 acquired retroversions or flexions.

TABLE 2.—*Retrodisplacements of the Uterus in a Series of 3,400 Consecutive Office Patients**

	Number of Cases		Approximate Percentage of Cases
	Con- genital	Acquired	
Developmental retroversions	72	..	19
Symptomless acquired malpositions.....	..	47	12
Relieved by treatment of complications....	..	50	13
Relieved by pessary.....	..	76	20
"Uncomplicated" retrodisplacements; pa- tient operated on after wearing a pessary	..	28	7
Primary corrective operation or operation after palliative measures failed.....	..	87	22
Hysterectomy for tumors (displacement of secondary importance) .....	..	27	7
	72	315	
Total.....	387		100

* Exclusive of forty-two who failed to subject themselves to treatment.

Treatment of the malposition itself was unnecessary in forty-seven cases. In the other 268, palliative measures sufficed to relieve symptoms in fifty; bimanual reposition and a pessary effected a cure in seventy-six; twenty-eight patients with "uncomplicated" displacements were operated on after wearing a pessary temporarily, and eighty-seven had a primary operation or were operated on after palliative measures failed to afford symptomatic relief. Hysterectomy for tumor was performed in twenty-seven cases, the uterine dislocation being of secondary importance (table 2).

In reviewing this series of cases, certain significant facts became apparent:

1. Several operations by other surgeons for the cure of developmental defects were followed by recurrence.
2. Many patients with congenital displacements were pregnant when first seen or became so after the application of negative galvanism to the uterus and the treatment of endocrine derangements. Endowment with a congenital malposition does not condemn a patient to sterility.
3. After delivery the uterus may involute in normal position, even though previously congenitally retrodisplaced.
4. Symptomless acquired retroversions were discovered in patients presenting themselves with conditions such as Bartholin cyst, pruritus vulvae, trichomonas infections, cervical polyp, sterility, urinary complaints, colitis and breast tumor. They were more common in postmenopausal women.
5. Successful palliative treatment embraced careful preliminary differential diagnosis as well as the correct therapy for hormonal imbalance, endocervicitis, parametritis and adnexal disease. In some instances a pessary was used after a fixed uterus became mobilized.
6. A high percentage of patients fitted with a pessary were impregnated while wearing the appliance or soon thereafter.

The multiplicity of operations devised for the surgical replacement of a retroverted or retroflexed uterus is not testimony of the uselessness of all of them, as has occasionally been intimated, but is rather evidence of appreciation on the part of discriminating gynecologists that no single technical procedure is universally applicable. Failures seldom represent lack of skill in execution; they more often result from inadequate preoperative differential diagnosis, on the one hand, and overenthusiasm in favor of a particular operation on the other. In a series of 2,550 personal consecutive pelvic operations, including ward service cases, I found that I had utilized some type of intraperitoneal uterine suspension in 286 (table 3).

In several instances the suspension was reinforced with a plication of the uterosacral ligaments, and all laparotomies were supplemented with whatever vaginal plastic repair was indicated.

The relatively small number of Baldy-Webster suspensions is an index of conservatism in operating for a replaceable retrodisplacement, since I am prejudiced in its favor wherever it can be judiciously selected. It can be done quickly, preserves normal uterine mobility, elevates prolapsed ovaries and in my experience has interfered less with subsequent pregnancy and parturition than any other corrective procedure. It is ideal for the patient who has worn a pessary with relief of symptoms, thus demonstrating to both patient and physician that the annoyances have been due to the uterine dislocation and nothing else and that maintaining the uterus in its normal position will effect a cure. Unfortunately its merits have often been responsible for its misapplication. It has been done when no operation was imperative, when the round ligaments were markedly attenuated or when adnexal disease required salpingo-oophorectomy. The intact utero-ovarian ligament, tube and ovary are the only sturdy structures capable of exerting counterpressure against the pull of the transplanted round ligament on the thin leaves of the broad ligament. It is apparent that if the utero-ovarian ligament is cut, as it must be when salpingo-oophorectomy is done, the broad ligament will soon yield to tension and recurrence is inevitable. Other causes of failure are using it for the support of a heavy

TABLE 3.—*Surgical Procedures for Retrodisplacement of the Uterus in 2,550 Consecutive Pelvic Operations**

Type of Procedure	Number of Cases
Baldy-Webster suspension	80
Crossen-Gilliam	160
Ventrifixation	28
Mann plication of round ligaments.....	12
Olshausen suspension	5
Coffey plication of round and broad ligaments.....	1
Total.....	286

* Exclusive of operations for displacements associated with tumors.

subinvolted corpus without plicating the uterosacral ligaments at the same time, and suturing the round ligaments too low on the posterior surface of the corpus, so that they serve as a fulcrum instead of as a support.

The large number of cases in which Crossen's modification of the Gilliam operation was done indicates the high incidence of concomitant adnexal disease in the patients subjected to surgical intervention for retrodisplacements. This operation also causes little trouble in event of subsequent gestation and delivery. Some

patients complain of soreness in the region of the round ligament attachment during the early months of pregnancy, but this is transitory and of little consequence. In only one of my cases has the operation been responsible for dystocia during labor, and intestinal obstruction has not followed in any case, so far as I know. The Crossen-Gilliam operation is not contraindicated by salpingo-oophorectomy, but the postoperative antero-posterior excursion of the corpus is somewhat limited as the bladder and rectum empty and fill.

A ventrifixation of the uterus was performed twenty-eight times in women past the menopause when the round ligaments were so short and thick that they could not be conveniently plicated, when the rapid removal of adnexal masses after extensive vaginal work was so easy that hysterectomy did not seem warranted, or when advantageously combined with a Crossen-Gilliam suspension in cases in which the uterus was prolapsed to the first degree. This group includes a few ventrosuspensions, attempted before I learned that the intended suspension usually terminates in a fixation, or the artificially created false ligament so stretches that the displacement eventually recurs.

Mann's plication of the round ligaments is indicated when the uterus is small and not to be sacrificed, both tubes have been removed at a previous operation and the round ligaments are unusually long but not much thinned out. Under these conditions it has proved entirely satisfactory.

Olshausen's suspension tends to immobilize the uterine fundus and thus interfere with proper bladder expansion. It has many strong advocates, but I have utilized it only five times, when speed was important after other prolonged operative procedures.

Coffey's plication of the round and broad ligaments is especially useful when the tubes have been extirpated at a previous operation and the round ligaments are so attenuated that they are almost lost in the reduplicated folds of the broad ligaments, but such cases are rarely seen.

SUMMARY AND CONCLUSIONS

Retrodisplacements of the uterus per se do not cause symptoms.

It is important to ascertain whether a malposition is congenital or acquired, whether the uterus is replaceable or immobilized and whether there is coexisting pelvic pathologic change.

The concealed complication in cases of replaceable displacement causing symptoms is passive congestion.

The true cause of many symptoms credited to a retrodisplacement will be found elsewhere. Careful differential diagnosis is of paramount importance.

A retrodisplacement may be treated prophylactically, expectantly, palliatively or surgically.

Pessaries are used to maintain normal uterine poise and position, not to correct a displacement. When fitted accurately they are worn with perfect comfort.

In a series of 3,400 consecutive office patients, a retrodisplacement was found 429 times, an incidence of 12.5 per cent; 142 of these were subjected to operation.

In a series of 2,550 consecutive personal operations, some form of intraperitoneal uterine suspension was done 286 times.

No single surgical procedure is universally applicable. An operation which fails to afford symptomatic relief is a failure.

580 Park Avenue.

ABSTRACT OF DISCUSSION

DR. BERTHA VAN HOOSSEN, Chicago: Dr. Dannreuther's treatment with pessaries I endorse. He makes the statement that congenital retroversions of the uterus are symptomless and therefore we shouldn't think of treating a symptomless condition. I should like to ask Dr. Dannreuther what he considers the cause of a congenital retroversion of the uterus. It seems to me that if the undescended testicle deserves assiduous treatment we might put a little less assiduous but some more treatment on the symptomless congenital retroversion. I didn't gather whether Dr. Dannreuther made an age limit to the surgical treatment for retroversion. I make a deadline. If a patient is over 40 I feel that she must have had the retroversion for a long time and there is apt to be accompanying fibrosis or seedling fibroids, and as the uterus is an organ that is not very necessary after 40 I invariably do a simple supravaginal hysterectomy. I was disappointed that Dr. Dannreuther never mentioned the Alexander operation, which is the pioneer. The Alexander operation has the advantage that it uses the attenuated distal portion of the round ligament by which to suspend the uterus, and I draw that round ligament up so tight that it really suspends the uterus. I wish the ligaments that support the uterus, the cardinal ligaments and the uterosacral, to have absolutely nothing dragging on them so that they will recover their tone at the end of from three to six months. Of course, during this three to six months the uterus is pulling on those adhesions that have been formed around the round ligaments, and they gradually give way and at the end of six months the uterus will be in a normal condition with all its mobility. I feel that mobility is the first requisite, the thing that we should try hardest to get, and that position of the uterus is secondary.

DR. R. S. CRON, Milwaukee: Dr. Dannreuther has handled the problem of retrodisplacements in a masterful fashion. Two points that he has mentioned should be emphasized. The first is that the postpartum examinations, especially when retrodisplacement is suspected, should be done at the end of the third or the fourth week and again repeated at the sixth or the eighth week. A tipped uterus, even if congenital, corrected at this time and held in place with a properly fitting support, may be permanently corrected. Second, the pessary should be used more frequently, especially for a therapeutic test in uncomplicated retroversion. There are two statements with which I wish to take issue. The first is the routine packing for forty-eight hours of all postabortion uteri with iodoform gauze. A few years ago I reviewed more than 1,000 cases of abortion treated in various ways and found that those treated most conservatively and with the least trauma experienced the most satisfactory convalescence. Consequently, I rarely pack. A retroversion suspected or found at this time is immediately corrected with a pessary. Second, the choice of operation. A brief study of the last 185 operations performed for retrodisplacement of the uterus also showed a multiplicity of operations having been used. It was found necessary or deemed advisable to perform a hysterectomy in slightly less than one fourth of them. The Baldy-Webster technic was used nine times. In spite of the fact that this is the operation advocated by many of America's most prominent gynecologists, I am prejudiced against it. I know of at least six patients who have developed intestinal obstruction following the operation. In the hands of the average operator, at least four different openings may be left into which a loop of intestine may become strangulated. Recurrences, especially retrocession, are not uncommon. A technic described many years ago by Reuben Peterson and similar to the Mayo operation has in my hands proved to be most satisfactory. Each round ligament is drawn through the inguinal ring and anchored to the posterior surface of the anterior sheath of the rectus muscle. This operation was used 120 times, or in about 70 per cent of the cases. In thirty-eight instances it was combined with the approximation of the sacro-uterine ligaments. There was one recurrence, but no other serious complications were encountered. Finally, it has been noted that Dr. Dannreuther has made no mention of the relation of endometriosis to chronic retroversion. I should like to know whether he considers the possibility of regurgitation of the menstrual endometrium through the tubes in congenital or acquired retrodisplacement an indication for its correction.

DR. LOUIS E. PHANEUF, Boston: I appreciate Dr. Dannreuther's lucid presentation of this important subject of retroversions of the uterus. I subscribe to the fact that a retroversion or a retrodisplacement per se seldom causes symptoms but that it is the concomitant pathologic condition which is responsible for the symptoms. Obviously a congenital displacement without symptoms requires no treatment. The frequent association of hypoplasia, dysmenorrhea and sterility with that type of uterus, however, needs our attention. I have found the atrophied uterus after the menopause in retroversion so frequently that in my mind the retroposed atrophic uterus is a fairly normal condition. One of the greatest uses of the pessary which I have found has been in the puerperal uterus which has remained large, with lax ligaments, which can be replaced manually very simply, and which a pessary will hold in position. The wearing of a pessary for a period of six months will frequently allow the ligaments to take up their tonus and thereby correct the position. The wearing of a pessary in a replaceable uterus to determine whether or not the symptoms are caused by the retroversion in my mind is an excellent procedure. In connection with suspension operations, there are three factors which govern the proper surgical replacement of the retroposed uterus, as I see it. The first is to bring the cervix back at right angles to the vagina, the second to bring the uterus forward, and the third to obliterate the space on the sides in order to avoid, so far as it is possible to do so, intestinal obstruction. This is accomplished by shortening the uterosacral ligaments by doing a round ligament suspension in such a way that the space on the sides is obliterated. It is my custom to do some sort of suspension after having operated for adnexal abnormality, with the end in view of preventing the formation of an adherent retroversion.

DR. O. S. KREBS, St. Louis: I merely want to mention a phase of prophylaxis of retrodisplacement of the uterus. It seems that at the end of the second week after delivery the rule is for the uterus to be forward, that the displacement occurs between that time and the fourth week, when from 20 to 41 per cent are found displaced posteriorly. Williams says one out of four or five, and Lynch 41 per cent. In October 1937 I began introducing a collapsible pessary, the Finley pessary of the Smith-Hodge type, in treating all private obstetric patients delivered by Dr. Royston and myself, just before they left the hospital. It has also been the custom for these patients to omit taking any douches for two weeks after getting home, and to insert into the vagina every other night a large capsule filled with 80 per cent beta lactose and 20 per cent boric acid, as suggested by Roblee. In the small series under consideration the results are not entirely tabulated, but the frequency of retrodisplacement after the puerperium is over is 18 per cent in primiparas and multiparas combined. There is a high frequency of congenital displacements in our cases, about 16 per cent in the aforementioned group, which were considered in the results, however, and it is noteworthy that among all the primiparas only those that we felt had congenital displacements ended with retrodisplacements at the end of the puerperium. Four of the patients with congenital displacements during early pregnancy had anteverted uteri when discharged from our care. Not considering the lessened incidence of displacement following delivery with the foregoing regimen, which may be worth while, the improved involution in practically all cases regardless of the final position of the uterus was very striking. No douches were given during this postpartal period, so the effect of heat can be dismissed. Probably the greatest factor in subinvolution is a local one and that is an abnormality of circulation which accompanies the displacement, and the results are obtained by the uterus being maintained in its normal position when involution is active. In addition to better involution, the cervix recovered from the effects of labor at an earlier time and more completely. Since this series of cases has been under observation it has not been found necessary to cauterize the puerperal cervix for erosion or endotrachelitis alone.

DR. A. C. HIRSHFIELD, Oklahoma City: Dr. Dannreuther has rightly emphasized the lack of symptoms in the uncomplicated case and has reemphasized the fact that surgery is ordinarily not indicated in these cases, but men practicing in

large hospitals and medical centers would be surprised if they realized the percentage of routine surgery, in the hospitals in the hinterlands, which consists of operations on tubes and retrodisplacements. Since I recognized the fact that surgery is not indicated in the ordinary case of salpingitis and retrodisplacement, I have not appeared in the operating room as often as I used to, and I have no enthusiasm for surgical intervention in these cases. To get back to the legal aspect of this matter, I wonder whether physicians realize how many large damage suit judgments are obtained because women who have been in minor accidents, particularly in taxicabs, show up afterward with retrodisplacement. In Oklahoma City the taxicabs compete with the street cars, and one can ride any reasonable distance for 10 or 15 cents. There are many taxicab accidents, and for years the damage suit lawyers managed to find physicians who found retrodisplacements in these women and who qualified as experts and testified more or less convincingly to the juries that these retrodisplacements were caused by taxicab accidents. The taxicab attorneys employed one or two of us who had a more or less scientific view to combat this wave of damage suit cases in favor of the retroverted uterus. By means of charts and models and impromptu lectures we went before these juries and demonstrated that these conditions were either congenital or caused by childbirth or other more or less natural feminine causes and were not caused by ordinary taxicab accidents.

DR. W. H. VOGT, St. Louis: I was glad to see that Dr. Dannreuther is still so old fashioned as to use the pessary. There is a definite place for the pessary when used properly with the proper indications and the proper type of pessary. There are contraindications to the use of the pessary that everybody must recognize, and Dr. Dannreuther, I think, has brought out some of those. In inflammatory conditions of the pelvis they should not be used; if the uterus cannot be elevated the pessary should not be used, because it will do more harm than good. I am not one of those who believe that the retroversion or retrodisplacement of the uterus which gives no symptoms should not be treated. There are certain types of retrodisplacement, that type of congenital retrodisplacement with a general atrophy of the pelvic organs and general ill development of the body, that do not need any treatment; treatment there is directed in a general way and not locally. Likewise, those cases of retrodisplacement which occur in the menopause I don't believe need any treatment. In the atrophic uterus of the menopause no treatment is needed, but in all other cases of retrodisplacement, even though there are no symptoms, I think treatment is indicated, because I feel convinced that the uterus acts as a wedge and that the retrodisplacement is simply a forerunner of a future prolapsus.

DR. WALTER T. DANNREUTHER, New York: In reply to Dr. Van Hoosen's inquiry regarding my opinion concerning the embryologic factors responsible for a congenital defect, I confess that I don't know how they operate. Even if we did know, it seems unlikely that such knowledge would be of practical value. To institute any effective therapeutic measures it would be necessary to make an exact diagnosis, which would involve the routine examination of all female infants and children. The Alexander-Adams operation of course was popular forty years ago, but modern abdominal surgery no longer carries with it the hazards of forty years ago. One does not hesitate to open the peritoneal cavity today, whereas forty years ago there were frequent consultations before such a serious step was undertaken. The Alexander-Adams operation requires two incisions instead of one, affords no opportunity to make an intraperitoneal exploration, is sometimes attended by technical difficulties when the round ligaments are thin and hard to find in the inguinal canal, and eventuates in a certain percentage of unsatisfactory results. Dr. Cron called attention to a typographic error in my paper which escaped my notice, namely, the recommendation that the uterus be packed after abortion; the qualifying word "therapeutic" should have been included. No instances of intestinal obstruction following Baldy-Webster operations have come to my attention, although my patients, both clinic and private, have an excellent follow-up. On the other hand it is evident that, if sutures are not placed properly in doing this operation, intestinal

obstruction might easily occur. I prefer Pagenstecher linen to catgut for stitching the round ligaments to the uterine corpus. No reference was made to endometriosis because it does not seem justifiable to put the tag of retrodisplacement on such a condition. All the anatomic relationships may be so distorted by endometriosis, just as they are in cases of pelvic tuberculosis, that I think that such cases were properly omitted from my statistical data. Under these circumstances a retrodisplacement is entirely secondary to another primary and more important pathologic process. The medicolegal aspects of uterine displacements are interesting, but the limitations of this paper precluded a reference to them.

TREATMENT OF PNEUMOCOCCIC MENINGITIS WITH SULFAPYRIDINE

AND THE SODIUM SALT OF SULFAPYRIDINE

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Since the demonstration by Whitby¹ of the effectiveness of sulfapyridine against pneumococcal infections in mice, many clinical reports have shown that the drug is of definite value in the treatment of pneumonia in man. It appears that the mortality rate from pneumonia in both children and adults is reduced when sulfapyridine is used.² Reports have appeared which indicate that the drug may be of value also in pneumococcal meningitis.³ However, the number of cases thus far described is so small that one cannot be certain that the prognosis in this disease will be, in general, altered by the use of sulfapyridine. There are published in the literature the records of only fourteen

From Sydenham Hospital, Baltimore City Health Department. The sulfapyridine and its sodium salt were furnished by Merck & Co., Inc., Rahway, N. J., under the names "Dagenan" and "Dagenan Sodium." Dr. E. K. Marshall, Jr. gave valuable advice on the dosage and method of administration of the sodium salt of sulfapyridine and supplied us with the first samples of the drug. Dr. Perrin H. Long showed constant interest in the progress of this study and made many helpful suggestions.

1. Whitby, L. E. II.: Chemotherapy of Pneumococcal and Other Infections, *Lancet* 1: 1210 (May 28) 1938.
2. As reported by:
 - Telling, M., and Oliver, W. A.: Case of Massive Pneumonia, Type III, with Massive Collapse, Treated with 2-(p-Aminobenzenesulfonamido) Pyridine, *Lancet* 1: 1391-1393 (June 18) 1938.
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 - Dr. E. K. Marshall, Jr. gave valuable advice on the dosage and method of administration of the sodium salt of sulfapyridine and supplied us with the first samples of the drug. Dr. Perrin H. Long showed constant interest in the progress of this study and made many helpful suggestions.
3. These reports include:
 - Reid, G. C. K., and Dyke, S. C.: Pneumococcal Meningitis Treated with M. & B. 693: Recovery, *Lancet* 2: 619 (Sept. 10) 1938.
 - Robertson, Kenneth: Case of Pneumococcal Meningitis Treated with M. & B. 693, *Lancet* 2: 728 (Sept. 24) 1938.
 - Cunningham, A. A.: Pneumococcal Meningitis Treated with Sulfanilamide and M. & B. 693, *Lancet* 2: 1114 (Nov. 12) 1938.
 - McAlpine, Douglas, and Thomas, G. C.: Pneumococcal Meningitis Treated with M. & B. 693, *Lancet* 1: 754 (April 1) 1939.
 - MacKeith, R. C., and Oppenheimer, G.: Pneumococcal Meningitis Treated with Pyridine (M. & B. 693), *Lancet* 1: 1099 (May 13) 1939.
 - Report of Five Consecutive Cases of Pneumococcal Meningitis Treated with Pyridine (M. & B. 693), *Lancet* 1: 1100 (May 13) 1939.
 - May, Kenneth: A Fatal Case of Pneumococcal Meningitis Treated with M. & B. 693, *Lancet* 1: 1101 (May 13) 1939.
 - Raman, P. S.: Pneumococcal Meningitis Treated with Sulfanilamide, *Lancet* 1: 1207 (May 27) 1939.
 - Backhouse, T. C., cited by Ross, R. W.: Acquired Tolerance of Pneumococcus to M. & B. 693, *Lancet* 1: 1207 (May 27) 1939.
 - Barnett, H. L.: Hartmann, A. F.: Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, *J. A. M. A.* 112: 518 (Feb. 11) 1939.

patients with pneumococcal meningitis who were treated with sulfapyridine alone. Eight of the fourteen recovered.

The present communication deals with the use of sulfapyridine and its sodium salt⁴ in the treatment of seventeen patients with pneumococcal meningitis admitted to the Sydenham Hospital between October 1938 and May 1939. Eight of these seventeen (47 per cent) recovered completely. Antipneumococcal serum was not employed in treating any of these patients. While it is difficult to attempt to estimate the value of any form of therapy in so small a series of patients, it should be pointed out that when no specific therapy is used the mortality rate in pneumococcal meningitis is so nearly 100 per cent that the survival of eight or seventeen patients seems striking enough to warrant detailed consideration.

This experience with sulfapyridine is in sharp contrast with our results obtained in treating pneumococcal meningitis during the eight years previous to the introduction of this drug. Between 1930 and 1936 no specific therapy was employed, and all of the twenty-nine patients treated during this time died. From December 1936 to October 1938, seventeen patients were treated with sulfanilamide but only one recovered. In all, forty-six patients were treated between January 1930 and October 1938 with only one recovery.

Four of the seventeen patients treated with sulfapyridine or its sodium salt were infants under 1 year of age. Five patients were between the ages of 6 and 12 years, while eight were adults varying in age from 28 to 54 years. Six were white and eleven were Negroes.

Pneumococci were cultured from the spinal fluid in each case. In every case these pneumococci were identified by cultural characteristics, by mouse inoculation and by the Neufeld-Sabin reaction with type-specific serum. The following types were isolated: I, III (twice), V, VI (twice), IX, XII (twice), XIV, XIX, XXII, XXIII, XXV, XXVII, XXIX and XXXI.

With the exception of the four patients who die within twenty-four hours after admission, the finding of pneumococci was confirmed by one or more additional spinal fluid cultures. From the blood of nine patients, pneumococci of the same type as that found in the spinal fluid were isolated.

The meningitis was of otitic origin in eight cases. In three instances the meningitis developed during the course of pneumonia and in one case it followed an infection of the eye. No source of the infection could be discovered in the remaining five cases.

METHOD OF ADMINISTRATION OF SULFAPYRIDINE AND SODIUM SULFAPYRIDINE

The first six patients were given sulfapyridine by mouth, while the remaining eleven received in addition the sodium salt of sulfapyridine intravenously. The amount of drug given by mouth varied between 1 and 12 Gm. in twenty-four hours, depending on the patient's age, on his condition and on the concentration of the drug in the blood and spinal fluid. In very young infants from 1 to 3 Gm. daily was given as compared with from 6 to 12 Gm. in older children and adults. In each case the total twenty-four hour dose was given immediately when the diagnosis of pneumococcal meningitis was made; one fourth of this amount was then

4. Marshall, E. K., Jr.; Bratton, A. C., and Litchfield, J. T., Jr.: The Toxicity and Absorption of 2-Sulfanilamidopyridine and Its Sodium Salt, *Science* 88: 597 (Dec. 23) 1938.

given every six hours. The full dose of sulfapyridine was continued by mouth until the patient seemed entirely well clinically and until several successive cultures of spinal fluid were sterile; the dose was never reduced before the temperature had been normal for one week. After this time the dosage was halved for several days and then the drug was discontinued entirely. On one occasion it was resumed because the occurrence of a relapse was suspected.

On admission many of the patients in this series were comatose or delirious and required the administration of the drug by nasal tube. This was continued until the patient was able to swallow.

In the treatment of the last eleven patients in this series the sodium salt of sulfapyridine was employed in addition to the oral administration of sulfapyridine. As Marshall⁴ has shown, the sodium salt, unlike sulfapyridine itself, is freely soluble. It is most conveniently used in distilled water in a 5 per cent solution, which is approximately isotonic. It should be emphasized that such a solution is extremely alkaline (p_H almost 11) and cannot be given intrathecally or subcutaneously but only intravenously.⁵ The sodium salt proved to be of great value. When it first became available it was given only to those patients who were unconscious or comatose and unable to swallow sulfapyridine. Later we employed it also in treating those patients in whom the concentration of the sulfapyridine in the blood and spinal fluid remained low during the oral administration of the drug. In such cases one or two daily intravenous injections of the sodium salt served to bring the concentration of sulfapyridine in the blood and spinal fluid to high levels. The intravenous administration of the sodium sulfapyridine proved to be of great value also for those patients who persistently vomited sulfapyridine given by mouth. At the present time we believe that the oral administration of sulfapyridine should be combined with a regular course of the sodium salt given intravenously. The plan of treatment which we now recommend and which we have employed in treating the last four patients, all of whom recovered, is as follows:

The oral administration of the drug is instituted on admission and continued in the manner already described. In addition, intravenous therapy with a 5 per cent solution of sodium sulfapyridine in distilled water is begun. An initial dose of 0.1 Gm. per kilogram of body weight is injected. Following this, 0.03 Gm. of the sodium salt per kilogram of body weight is given intravenously every six hours until the patient shows definite clinical signs of improvement and until two successive lumbar punctures are sterile. After this, the sodium sulfapyridine is given only twice a day for several days longer, and then it is discontinued. Intravenous therapy should be resumed at the first indication that a relapse has occurred.

None of the patients treated with sulfapyridine received antipneumococcus serum. Forced spinal drainage was not employed and lumbar punctures were done only for diagnostic purposes and occasionally to relieve pressure symptoms. Supportive measures, such as the administration of intravenous fluids and frequent blood transfusions, were given as necessary. Myringotomy was performed in six cases but it was thought advisable in only two cases to attempt to eradicate the original focus of infection by extensive surgical methods. A mastoidectomy was performed on one of these

patients (patient 3), who recovered, but it was very doubtful that the operation exerted any definite effect on the course of the meningitis. In the other case the meningitis apparently followed pneumococcic panophthalmitis of one eye. Enucleation was not followed by any improvement in the patient's condition, and he eventually died.

CONCENTRATION OF SULFAPYRIDINE IN BLOOD AND SPINAL FLUID

With a modification of Marshall's⁶ method for sulfanilamide, the concentration of free sulfapyridine in the blood and spinal fluid was determined on a number of occasions in twelve cases. It was found that when the drug was given orally there was great variation in the concentration of sulfapyridine. There was no good correlation between the dose of the drug given by mouth and the level of sulfapyridine in the blood and spinal fluid. The concentration of the drug in the spinal fluid in those patients who received the drug by mouth varied only from 1.1 to 11.4 mg. per hundred cubic centimeters. It was generally higher in those patients who also received sodium sulfapyridine intravenously. In one such case the concentration in the spinal fluid

TABLE 1.—Treatment of Pneumococcic Meningitis at Sydenham Hospital, 1930-1939

Treatment	All Cases			Adequately Treated Cases Excluding 24 Hour Deaths		
	Number Treated	Recovered		Number Treated	Recovered	
		Number	Per Cent		Number	Per Cent
Before use of sulfanilamide and sulfapyridine (no antipneumococcal serum).....	29	0	0	14	0	0
Sulfanilamide.....	17	1	6	12	1	8
Sulfapyridine.....	17	8	47	13	8	61

reached 29 mg. per hundred cubic centimeters. The concentration of sulfapyridine in the blood was usually from 30 to 50 per cent higher than it was in the spinal fluid.

TOXIC EFFECTS OF SULFAPYRIDINE

During the course of treatment with the large doses of sulfapyridine and its sodium salt which were employed, a number of toxic effects of the drug were noted. The drug produced nausea and vomiting in more than half the patients, but these symptoms were severe in only one case. Cyanosis of mild degree was seen in four of the patients; it was accompanied by no untoward effects. The drug did not produce anemia of appreciable degree in any of the cases. In one adult (D. C.) mild leukopenia was noted, and in one child (C. M.) severe granulocytopenia developed. Owing to an oversight, this child continued to receive the drug ten days after it was believed to have been withdrawn. The white blood count dropped to 4,000 cells, of which 96 per cent were lymphocytes. The granulocytopenia was accompanied by fever of 104 F. and by membranous pharyngitis. The drug was discontinued and supportive measures were instituted. The patient improved almost at once and the temperature became normal in six days. The white blood cell count rose gradually until it reached 9,500 with 70 per cent polymorphonuclear leukocytes ten days after the discovery of the granulocytopenia.

5. Marshall, E. K., Jr., and Long, P. H.: The Intravenous Use of Sodium Sulfapyridine, *J. A. M. A.* 112: 1671 (April 29) 1939.

6. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: The Determination of Sulfanilamide, *Science* 88: 85 (July 22) 1938.

In three of the cases the administration of sulfapyridine caused gross hematuria. In the first case (case 2), the hematuria appeared on the fifth day after the institution of sulfapyridine therapy. The hematuria was not accompanied by oliguria, hypertension or an increase in the nonprotein nitrogen of the blood. Within four days after withdrawal of the drug, the urine was normal microscopically; the number of formed elements as measured by the Addis count was within normal limits, and phenolsulfonphthalein tests

pyridine therapy was begun again and was continued for the next four days. During this time gross hematuria reappeared and persisted until two days after the drug was again discontinued.

In a third case (case 17) hematuria developed fourteen hours before death. Autopsy showed very clearly that death was not caused by the hematuria but was due to very extensive meningitis which had apparently not been affected by sulfapyridine. Gross examination showed that the pyramids, calices, pelves and ureters

TABLE 2.—Results in Seventeen Cases of Pneumococcic Meningitis Treated with Sulfapyridine and Sodium Sulfapyridine

Case No.	Name, Age, Color, Sex	Clinical Condition on Admission	Original Focus of Infection	Blood Culture, Type Pneumococcus	Type Pneumococcus in Spinal Fluid	Spinal Fluid Sterile (Days After Treatment Begun)	Duration of Fever After Sulfapyridine Begun, Days	Treatment	Concentration of Free Sulfapyridine, Mg. per 100 Cc.		Toxic Effects of Drug	Results
									Blood	Spinal Fluid		
1	G. J. 34 yrs. Negro ♂	Critically ill; comatose; temp. 104.4 F.	Pneumonia	25	25	17	5	Sulfapyridine by mouth only	1.7-4.8	1.1-4.0	None	Recovered
2	A. P. 7 yrs. White ♂	Moderately ill; temp. 103 F.	Otitis media	Negative	1	2	3	Sulfapyridine by mouth only	Not done	Not done	Hematuria	Recovered
3	C. M. 11 yrs. Negro ♀	Critically ill; comatose; temp. 105 F.	Otitis media	Negative	5	1	3	Sulfapyridine by mouth and sodium sulfapyridine intravenously; mastoidectomy	Not done	Not done	Agramulocytopenia	Recovered
4	C. B. 32 yrs. Negro ♂	Critically ill; comatose; temp. 103 F.	Not known	Negative	0	2	3	Sulfapyridine by mouth and sodium sulfapyridine intravenously	3.2-8.0	2.7-4.0	None	Recovered
5	D. C. 49 yrs. Negro ♂	Critically ill; delirious; temp. 103.8 F.	Not known	23	23	10	4	Sulfapyridine by mouth and sodium sulfapyridine intravenously	1.8-25.0	1.3-13.3	Moderate leukopenia	Recovered
6	D. G. 35 yrs. Negro ♂	Moderately ill; temp. 100 F.	Not known	12	12	5	3	Sulfapyridine by mouth and sodium sulfapyridine intravenously	4.1-14.0	4.5-7.5	None	Recovered
7	A. T. 45 yrs. White ♀	Critically ill; delirious; temp. 102 F.	Otitis media	Negative	3	11	5	Sulfapyridine by mouth and sodium sulfapyridine intravenously	11.0-25.5	13.0-20.0	None	Recovered
8	G. M. 11 yrs. White ♂	Critically ill; profound coma; temp. 101 F.	Otitis media	3	3	3	2	Sulfapyridine by mouth and sodium sulfapyridine intravenously	11.1-15.3	5.5-15.0	None	Recovered
9	B. S. 6 yrs. White ♀	Moderately ill; temp. 103 F.	Otitis media	Negative	27	3	7	Sulfapyridine by mouth and sodium sulfapyridine intravenously	Trace-8.7	Trace-5.2	Severe vomiting, hematuria	Died (cerebellar abscess)
10	A. E. 23 yrs. Negro ♂	Moribund; temp. 105 F.	Not known	12	12	Not sterile	..	Sulfapyridine by mouth only	Not done	Not done	None	Died in less than 24 hours
11	J. W. 9 mos. Negro ♂	Moribund; temp. 100.2 F.	Otitis media	6	6	Not sterile	..	Sulfapyridine by mouth and sodium sulfapyridine intravenously	Not done	Not done	None	Died in less than 24 hours
12	C. N. 5 mos. White ♂	Moribund; temp. 101.4 F.	Otitis media	29	29	Not sterile	..	Sulfapyridine by mouth only	10.4	7.5	None	Died in less than 24 hours
13	D. N. 1 yr. Negro ♂	Moribund; temp. 103 F.	Not known	6	6	Not sterile	..	Sulfapyridine by mouth and sodium sulfapyridine intravenously	16.0-30.3	Not done	None	Died in less than 24 hours
14	D. W. 10 mos. Negro ♂	Critically ill; temp. 102.4 F.	Pneumonia	14	14	Not sterile	..	Sulfapyridine by mouth only	8.2	6.4-11.4	None	Died
15	C. J. 31 yrs. Negro ♂	Critically ill; comatose; temp. 105 F.	Panophthalmitis	Negative	22	Not sterile	..	Sulfapyridine by mouth only; enucleation of right eye	4.7-10.5	1.0-7.5	None	Died
16	C. W. 12 yrs. White ♂	Critically ill; delirious; temp. 102.2 F.	Otitis media	Negative	19	Not sterile	..	Sulfapyridine by mouth and sodium sulfapyridine intravenously	Not done	12.0-29.0	None	Died
17	W. H. 54 yrs. Negro ♂	Critically ill; comatose; temp. 102.2 F.	Pneumonia	Negative	31	Not sterile	..	Sulfapyridine by mouth and sodium sulfapyridine intravenously	Not done	Not done	Hematuria	Died

were normal. Apparently no permanent damage to the kidney resulted from the hematuria.

In the second case (case 9) hematuria developed on the fourth day of treatment with sulfapyridine and its sodium salt. In this case also the hematuria was not accompanied by changes in blood chemistry or by elevation in blood pressure, and there was no oliguria. Fluids were forced but, since the spinal fluid cultures were still positive, the intravenous administration of sodium sulfapyridine was continued. The spinal fluid became sterile two days after the onset of hematuria, and when the sodium sulfapyridine was withdrawn four days later both the urine and the spinal fluid were normal. About two weeks later the patient showed clinical evidence of a relapse, and it was suspected that she was suffering from a brain abscess. Sodium sulfa-

pyridine therapy was begun again and was continued for the next four days. During this time gross hematuria reappeared and persisted until two days after the drug was again discontinued.

In a third case (case 17) hematuria developed fourteen hours before death. Autopsy showed very clearly that death was not caused by the hematuria but was due to very extensive meningitis which had apparently not been affected by sulfapyridine. Gross examination showed that the pyramids, calices, pelves and ureters

of both kidneys, as well as the bladder, contained gravel-like calculi. These calculi were very rough, with many pointed spicules. Dr. A. Calvin Bratton in Dr. E. K. Marshall Jr.'s laboratory showed that these small calculi were made up almost entirely (85 per cent) of the acetyl derivative of sulfapyridine. Microscopic sections showed that the calculi apparently had eroded the epithelial cells lining the pelves, ureters and bladder and had caused hematuria by injury to the underlying capillaries. No crystals of sulfapyridine or calculi were found in the glomeruli or tubules and no evidence of injury to these structures was found.

It appears, therefore, that the hematuria caused by sulfapyridine is due to mechanical injury to the urinary tract. It seems reasonable to suppose that the hematuria

turia will not be accompanied by serious or permanent interference with renal function, unless the precipitation of the acetyl sulfapyridine is so extensive as to produce blockage of the tubules or urters.

Dr. E. K. Marshall Jr.⁷ offers the following explanation for the formation of calculi of acetyl sulfapyridine in the urinary tract: When sulfapyridine is ingested, part of it is acetylated and is excreted in the urine with some free sulfapyridine. The amount of sulfapyridine which is acetylated varies greatly with the individual patient. Acetyl sulfapyridine, which is not very soluble at best, is even less so in acid mediums. It is probable that even when the concentration of this substance is high in the blood it remains in solution in the glomerular filtrate. However, as the urine becomes more concentrated and more acid as it passes down the tubular system, precipitation of the crystalline acetyl sulfapyridine may occur. These sharp-edged crystals and small calculi formed around them probably cause hematuria by mechanical injury. Dr. Marshall suggests that with a given dose of sulfapyridine the danger of the occurrence of hematuria might be lessened by the administration of alkali and by supplying an adequate fluid intake.

RESULTS FOLLOWING TREATMENT

Table 2 summarizes our experience with the use of sulfapyridine and its sodium salt in pneumococcic meningitis. As already stated, eight of the seventeen patients treated (47 per cent) recovered. Up to the present time no sequelae of any kind have been noted and these patients appear to be entirely well. This result is particularly striking when the condition of the patients on admission to the hospital is considered. Four were moribund and died in less than twenty-four hours; ten were critically ill and delirious or comatose, while three were only moderately ill. Of the thirteen patients who survived more than twenty-four hours, only five failed to recover. Among the seventeen patients there were four under 12 months of age; all these infants died in less than twenty-four hours after the beginning of treatment with sulfapyridine. Three of the five children between the ages of 6 and 12 years recovered, as did five of the eight adults in the group.

In those patients who recovered, clinical improvement was noted very soon after treatment with sulfapyridine was begun. Usually the first evidence of beneficial action of the drug was improvement in the patient's mental status. On a number of occasions the patient who had been stuporous or irrational became oriented and alert within twenty-four hours after the beginning of treatment. Among the patients who recovered, the temperature reached normal within four days and the spinal fluid cultures became sterile within five days, with the exception of one (patient 1), whose spinal fluid cultures showed pneumococci for seventeen days. In two cases (5 and 7) a relapse occurred with the transient appearance of pneumococci in the spinal fluid. A very dramatic example of the prompt effect of the drug is shown in the accompanying chart.

Pneumococci were recovered from the blood cultures on admission of four of the patients who recovered.

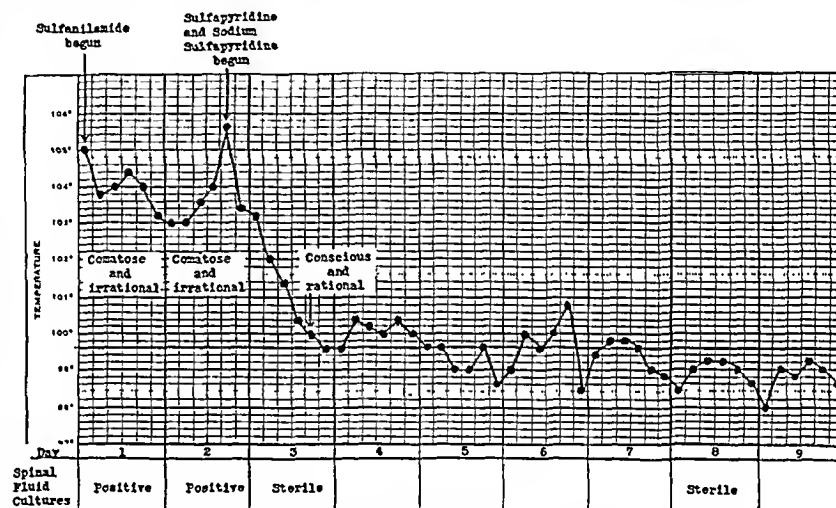
The blood cultures in these cases became sterile within a few days after the beginning of treatment.

Three of the patients who recovered showed paralysis of the facial nerve of the peripheral type during the course of their illness. During convalescence, however, the paralysis gradually became less marked and all three patients eventually regained complete use of their facial muscles.

In one instance death was caused by a cerebellar abscess. At autopsy the meninges were found to be perfectly normal. Apparently treatment with the sulfapyridine had brought about complete resolution of the infiltration and infection in the meninges but had not caused healing of the brain abscess.

COMMENT

It seems evident that the mortality rate from pneumococcic meningitis can be reduced by the use of sulfapyridine and its sodium salt. The outlook for the average patient with this disease has been improved,



Course of meningitis due to type V pneumococci in a Negro girl aged 11 years (case 3). Dramatic and rapid improvement after sulfapyridine therapy was started.

perhaps by 50 per cent. Our experience indicates that the drug is effective against all types of pneumococci.

One of the great handicaps encountered in treating meningitis with sulfapyridine is the irregularity of the absorption of the drug, which probably accounts for the great variation in its concentration in the blood and spinal fluid. This drawback may be eliminated by the use of the sodium salt of sulfapyridine. By administering the sodium salt at regular intervals, as we have done in treating our last four patients, all of whom recovered, the concentration of sulfapyridine in the spinal fluid may be maintained at any desired level. We believe that this is the important function of the sodium salt, which should be used in amounts sufficient to maintain the spinal fluid concentration of sulfapyridine between 10 and 15 mg. per hundred cubic centimeters.

That the use of sulfapyridine may be accompanied by serious toxic effects is, of course, well known. However, in dealing with meningitis, the most dangerous of all pneumococcic infections, it may be necessary to continue treatment with the drug despite these untoward effects. For example, we believe that the drug should be given even in the face of hematuria, since the patient's life depends on the action of the drug.

There remains the possibility that better results might be obtained by combining sulfapyridine with antipneumococcus serum. On this point we have no data to offer.

REPORT OF CASES⁸

CASE 2.—A. P., a white boy aged 7 years, was admitted to the hospital Jan. 16, 1939, and discharged well February 4.

Five days before admission, the child complained of pain in the right ear. The next day he became drowsy and remained so until admission to the hospital. On the night before entry he became "dizzy" and complained of a great deal of pain in the back of his neck when he attempted to raise his head.

On arrival at the hospital the patient, who was well developed and well nourished, did not appear to be critically ill. His neck was slightly stiff and Kernig's sign was present. On otoscopic examination the left drum was seen to be bulging, but no mastoid tenderness or edema was present. Physical examination otherwise was entirely negative.

On admission the spinal fluid showed 2,000 cells per cubic millimeter but no organisms were seen on smear. Sulfanilamide therapy was begun at once. Myringotomy of the left ear drum was done with the release of a large amount of thick pus. The next day, type I pneumococci were recovered from cultures of the spinal fluid and of the pus from the ear and from the throat, and sulfapyridine therapy was begun. Six Gm. a day was given for four days. On the fourth day of sulfapyridine treatment, hematuria developed with passage of a few blood clots. Sulfapyridine was immediately discontinued and within the next five days the urine became clear and negative microscopically. All kidney function tests were normal one week after the hematuria had appeared.

The spinal fluid cultures were negative at the time the sulfapyridine was discontinued, and the patient did not require any further medication.

The temperature on admission was 103 F. and returned to normal on the second day. On the fourth day the temperature rose to 102 F. At this time the left ear drum was reopened and pus was obtained, following which the temperature returned to normal.

On admission the patient was found to be strongly sensitive to a test dose of rabbit and horse serum, and consequently antipneumococcus serum could not be used.

On discharge the left ear was completely healed. The urine was normal and no residual changes were present.

LABORATORY DATA

Spinal fluid cultures were positive for pneumococci (type I) January 16 and 17 but sterile thereafter.

Culture of pus taken from the left ear was positive for pneumococci (type I) January 16.

Culture of material taken from the throat was positive for pneumococci (type I) January 17.

The urine was normal, except for gross hematuria on the fourth day in the hospital, which cleared in five days and remained normal thereafter. The Addis count was normal.

Nonprotein nitrogen was 40.2 mg. per hundred cubic centimeters of serum at the time of hematuria.

Blood culture was sterile January 17.

CASE 3.—C. M., a Negro girl aged 11 years, was admitted to the hospital Feb. 11, 1939, and discharged well March 24.

Six days before admission the patient noticed a copious discharge from her left ear. The next day her gait became unsteady. She continued to have fever and became increasingly weak until on the day of admission to the hospital she suddenly became unconscious.

Physical examination on admission showed that she was well developed and well nourished; she appeared critically ill. She was irrational and failed to respond to stimuli. She was in opisthotonos. There was an internal squint of the left eye. Foul pus drained from the left ear and there was a watery nasal discharge. The Kernig and Brudzinski signs were present. Lumbar puncture revealed cloudy spinal fluid which

contained 4,300 cells, nearly all of which were polymorphonuclear leukocytes. On smear there were present numerous gram-positive diplococci which proved on culture to be type V pneumococci. The patient was treated with sulfanilamide for two days without improvement, and a simple left mastoidectomy done twenty-four hours after admission was not followed by any change in her condition. At the end of the patient's second day in the hospital the temperature was 105.6 F. She was in a comatose condition and appeared to be moribund. At this point she was given 70 cc. of a 5 per cent solution (3.8 Gm.) of the sodium salt of sulfapyridine intravenously and oral administration of sulfapyridine (6 Gm. a day) was begun. During the next twenty-four hours the temperature dropped to normal; the patient became conscious and was able to speak rationally. She received 6 Gm. of the drug each day for fifteen days and then 4 Gm. a day for the next seven days, after which time the sulfapyridine was discontinued. In addition to the sulfapyridine by mouth, she was given daily injections of the sodium salt of sulfapyridine intravenously for five days.

As noted, the temperature fell from 105.6 F. to normal within twenty-four hours after the first intravenous injection of sodium sulfapyridine. Thereafter it did not rise above 100.6 F. (rectal) until on the twenty-eighth day in the hospital, when it rose to 103 F. owing to the onset of agranulocytic angina. Ten days later the temperature became normal and remained so until discharge.

The mastoid wound healed uneventfully and at the time of discharge only a small granulating area still persisted. The spinal fluid count decreased from 4,300 cells on admission to 13 cells eight days later. The spinal fluid became sterile within twenty-four hours after the beginning of sulfapyridine therapy and remained so thereafter.

The chart is a graphic illustration of the patient's course during the first nine days in the hospital.

LABORATORY DATA

The spinal fluid cultures were positive for pneumococci (type V) February 11 and 13, and sterile February 14, 19 and 23.

The blood cultures were sterile February 11 and 15.

Blood counts showed: February 11, hemoglobin content 14 Gm., white blood cells 14,000 with 88 per cent polymorphonuclears; March 10, white blood cells 4,100 with 2 per cent polymorphonuclears and 98 per cent mononuclears; March 20, white blood cells 9,500 with 70 per cent polymorphonuclears.

Cultures of material taken from the ear and from the mastoid were positive for pneumococci (type V).

Examination of the urine showed 5 or 6 white blood cells per high power field, 2 plus albumin and a trace of acetone. Subsequent examinations were negative.

Culture of material taken from the throat at the time membrane appeared in the throat showed many beta hemolytic streptococci, group A, Lancefield.

SUMMARY

1. Seventeen patients with pneumococcic meningitis were treated with sulfapyridine or with sulfapyridine and its sodium salt.

2. Eight of these seventeen patients (47 per cent) recovered completely. Four of the nine who failed to survive died in less than twenty-four hours after admission to the hospital.

3. Sulfapyridine given by mouth is absorbed irregularly and only in limited amounts. It is recommended that the use of this drug be supplemented by the intravenous administration of sodium sulfapyridine at regular intervals. The concentration of free sulfapyridine in the spinal fluid should be maintained at a level of from 10 to 15 mg. per hundred cubic centimeters.

4. Certain toxic symptoms caused by sulfapyridine have been encountered. These include granulocytopenia and hematuria, neither of which was fatal in any of our cases.

8. Owing to lack of space reports of only case 2 and case 3 are included in THE JOURNAL. Reports of all seventeen cases will be found in the authors' reprints.

5. Hematuria occurring during treatment with sulfapyridine has been shown to be due to the formation of small calculi made up chiefly of the acetyl derivative of sulfapyridine. These calculi apparently produce hematuria by injury to the pelves, ureters and bladder.

6. It appears that the prognosis in pneumococcic meningitis may be greatly improved by the use of sulfapyridine and its sodium salt.

Harford Road at Herring Run.

A HITHERTO UNDESCRIBED SURGICAL PROCEDURE RELIEVING ATTACKS OF ANGINA PECTORIS

ANATOMIC AND PHYSIOLOGIC BASIS

RUPERT B. RANEY, M.D.

LOS ANGELES

Despite the various approaches to the problem of angina pectoris, uniformly complete relief from the condition by surgery or medicine has not been heretofore attained. On the assumption that coronary spasm occurs during attacks and is responsible for anginal pain, another operation has been designed which, so far as my experience permits of statements, seems to give uniform relief not by anesthesia but by prevention of coronary spasm.

It seems to be fairly generally accepted that coronary spasm occurs during seizures, but the mechanism is a much disputed question, confusion arising primarily from the reasonably well established normal behavior of these vessels. Any discussion on the surgical treatment is hardly complete without mentioning the name of Sir James Mackenzie,¹ whose timely criticism marks the dividing line between faulty speculation and sound scientific reasoning.² He suggested that a reinvestigation of the entire subject was necessary before any conclusions whatever could be drawn.

PHYSIOLOGIC BASIS FOR OPERATION

Following the suggestion of Mackenzie, Anrep and Segall³ reported from their results in animal experimentation that sympathetic impulses under normal physiologic conditions induced coronary dilatation, a finding which would be expected from the known emergency function of the sympathetico-adrenal mechanism.⁴ The work of Anrep and Segall was later verified by Kountz, Pearson and Koenig⁵ by experiments conducted on human heart-lung preparations. They further observed that when the normal physiologic conditions in the coronary system were altered, for example, arteriosclerosis and change in hydrogen ion concentration of the perfusion fluid, the action was variable, often reversed.

The reversed action following sympathetic stimulation with reference to other organs of the body has been

established by Morat,⁶ Doyon,⁷ Veach,⁸ McCrea and McSwiney⁹ and numerous others. Also it is well known that the action of efferent nerve impulses, whether sympathetic or otherwise, depends on the conditions at the myoneural junction rather than on the character of the impulse. This is best shown by experiments with crossed nerve sutures, of which the most pertinent are those of Langley and Anderson,¹⁰ Cannon, Binger and Fitz,¹¹ Horrax,¹² Ballance¹³ and Duel and Ballance.¹⁴

A survey of the literature forces one to agree with Wiggers¹⁵ that "the nervous control of the coronary circulation and its physiological importance have not been demonstrated as definitely as the uninitiated are led to believe." Furthermore, Anrep¹⁶ has attached considerable significance to pathologic changes in the coronary arteries with reference to altered function. He states (p. 94) that:

The experiments made of fresh human material are far too few to allow us to draw definite conclusions. Still fewer are the experiments made on human hearts which show some pathological changes of the coronary system. Anitchkov and his colleagues have worked on resting human hearts some hours after death. They report that, in cases of arteriosclerosis and diphtheria, adrenalin, even in large doses, ceases to have any effect on the coronary blood vessels. We have had no opportunity of verifying this result; there is no doubt, however, that in arteriosclerotic conditions the coronary blood vessels behave quite differently from normal.

Unfortunately the older clinical impression that sympathetic impulses were coronary constrictor in their action during an attack of angina pectoris was discarded and replaced by the more recent concept of the normal action, the altered or reversed action resulting from pathologic changes not being taken into consideration. White¹⁷ expressed this more recent and fairly general clinical opinion, which is well brought out by the following quotation (p. 235):

Why resection of the superior cervical ganglion alone, as recommended by Coffey and Brown, should relieve a certain number of cases of angina pectoris remains a mystery. No afferent neurons have been found in the upper portion of the cervical sympathetic trunk (cf. chapter III). The only plausible explanation put forward was that a greater portion of the coronary constrictor fibers run through the superior cardiac nerve, and that its interruption increases the irrigation of the myocardium. In view of the more recent physiological findings, however, this can no longer be regarded as a valid explanation.

6. Morat, J. P.: Sur quelques particularités de l'innervation mortice de l'estomac et de l'intestin, *Arch. de physiol. norm. et path.* 5:142-153, 1893.

7. Doyon, J.: Recherches expérimentales sur l'innervation gastrique des oiseaux, *Arch. de physiol. norm. et path.* 6:887-898, 1894.

8. Veach, H. O.: Studies on Innervation of Smooth Muscle; Splanchnic Effects on Lower End of Esophagus and Stomach of Cat, *J. Physiol.* 60:457-478 (Oct.) 1925.

9. McCrea, E. D., and McSwiney, B. A.: Effect on Stomach of Stimulation of Peripheral End of Splanchnic Nerve, *Quart. J. Exper. Physiol.* 18:301-313 (May) 1928.

10. Langley, J. N., and Anderson, H. K.: On the Effects of Joining the Cervical Sympathetic Nerve with the Chorda Tympani, *Proc. Roy. Soc., London*, s.B. 73:99, 1904; On the Union of the Fifth Cervical Nerve with the Superior Cervical Ganglion, *J. Physiol.* 30:439-442, 1903-1904.

11. Cannon, W. B.; Binger, C. A. L., and Fitz, Reginald: Experimental Hyperthyroidism, *Am. J. Physiol.* 36:363-364 (March) 1915.

12. Horrax, G., cited by Cushing, Harvey: Studies in Intracranial Physiology and Surgery, London, Oxford University Press, 1926, footnote on pages 75-76.

13. Ballance, Charles: Anastomosis of Nerves: Experiments in Which the Central End of the Divided Cervical Sympathetic Nerve Was Anastomosed to the Peripheral End of the Divided Facial Nerve and to the Peripheral End of the Divided Hypoglossal Nerve, *Arch. Neurol. & Psychiat.* 25:1-28 (Jan.) 1931.

14. Duel, A. B., and Ballance, Charles: Note on Result Which Follows Grafting of Raw Peripheral End of the Divided Cervical Sympathetic Nerve to Another Nerve in the Vicinity, *Brain* 55:226-231 (June) 1932.

15. Wiggers, C. J.: Disease of the Coronary Arteries and Cardiac Pain, edited by R. L. Levy, New York, Macmillan Company, 1936, p. 97.

16. Anrep, G. V.: Lane Memorial Lectures; Studies in Cardiovascular Regulation, Stanford Univ. Publ., Univ. Series, M. Sc. 3:199-312, 1936.

17. White, J. C.: The Autonomic Nervous System: Anatomy, Physiology and Surgical Treatment, New York, Macmillan Company, 1935.

From the Department of Surgery of the University of Southern California School of Medicine and the Neurosurgical Service of the Los Angeles County Hospital.

1. Mackenzie, James: Plea for Clinical Physiology, *Brit. M. J.* 1:1122-1125 (June 28) 1924.

2. Mackenzie, James: Surgical Treatment of Angina Pectoris, *Lancet* 2:695-697 (Oct. 4) 1924.

3. Anrep, G. V., and Segall, H. H.: Regulation of the Coronary Circulation, *Heart* 13:239-260 (Sept. 29) 1926.

4. Fulton, J. F.: Physiology of the Nervous System, New York, Oxford University Press, 1938, chapter 12.

5. Kountz, W. G.; Pearson, E. F., and Koenig, K. F.: Observation on the Effect of Vagus and Sympathetic Stimulation on Coronary Flow of Revived Human Heart, *J. Clin. Investigation* 13:1065-1078 (Nov.) 1934.

seizure they respond to these drugs in the same fashion as their observed action on peripheral vessels cannot be logically disposed of.

Furthermore, the interruption of sympathetic efferent pathways is known to have given relief from attacks in a fair percentage of cases. This was shown by Coffey and Brown¹⁹ when they reported their results from resection of the left superior cervical ganglion, and, since the superior cardiac nerve is now known to be

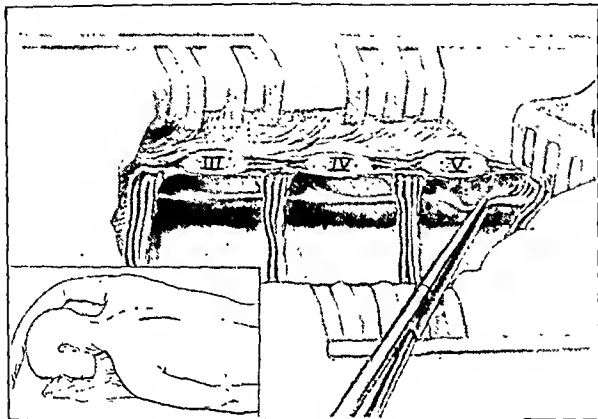


Fig. 3.—The artist's conception of the operation after exposure of the sympathetic chain and rami communicantes.

almost entirely efferent, the contribution accordingly was of exceptional value, because it shows that attacks were occasionally prevented by partially checking the inflow of sympathetic efferent impulses. Certainly the afferent mechanism was not sufficiently altered by the operation to explain the results (fig. 1). This evidence likewise must be taken into account.

Thus, although it appears that the normal and predominant action of sympathetic impulses in coronary physiology is to produce dilatation, the contention arises that under pathologic conditions—for example angina pectoris—the action is reversed; that is, such impulses produce coronary constriction. If this contention is sustained, we then have a single explanation for all the manifestations of the disease; an operation designed to interrupt this discharge of impulses could therefore be reasonably expected to give relief. However, before an operation is designed, the reaction of blood vessels to preganglionic and postganglionic sympathetic denervation must be taken into consideration.

The Meltzers²⁷ and Elliott²⁸ showed that, following postganglionic sympathetic denervation of smooth muscle, a permanent spastic condition developed from the direct action of epinephrine, muscle metabolites and other products normally found in the blood; they further observed that, following preganglionic denervation, spasm did not occur. Thirty years later Smithwick, Freeman and White²⁹ verified these observations on

smooth muscle of blood vessels. They then applied preganglionic denervation in the treatment of Raynaud's disease with remarkable success.

ANATOMIC CONSIDERATIONS

On the assumption, then, that an abnormal action of sympathetic impulses resulting from pathologic changes at the myoneural junction is responsible for an attack of angina pectoris, an operation was planned to interrupt the pathways conveying these impulses. Anatomically it is possible to avoid the production of a Horner's syndrome, and at the same time to remove completely the sympathetic influence on the cardiac mechanism (fig. 2). The anatomy is well described by Ranson,³⁰ Kuntz,³¹ Heinbecker³² and others. To remove completely this influence it would be necessary to operate on both sympathetic trunks; however, unilateral (left) section so far is all that has been required for complete relief from attacks.

CHOICE OF ANESTHESIA

The choice of anesthesia is of considerable importance and should perhaps receive some attention here. All factors likely to increase emotional stress should be eliminated for the purpose of preventing the possibility of a fatal seizure. Leary³³ pointed out that death can occur from prolonged coronary spasm, even without thrombus formation. Adequate sedation should therefore be employed during the hospital interim prior to operation. If avertin with anylene hydrate is administered thirty minutes before the patient is conveyed to the operating room, it will do away with the emotional stress usually associated with this unpleasant trip; of further advantage, its action is vasodilator on the vascular tree. Finally, infiltration of the operative field with procaine hydrochloride gives a satisfactory anesthesia.

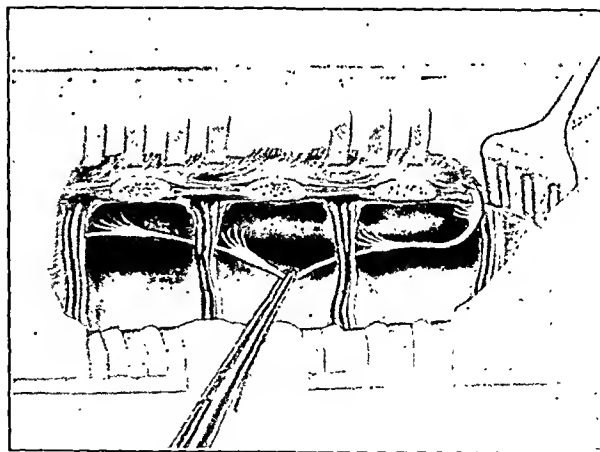


Fig. 4.—The artist's sketch here shows the operation completed; the rami communicantes have been sectioned and the sympathetic trunk between the fifth and sixth dorsal ganglia has been sectioned. The proximal end of the trunk has been sutured to the deep muscle layers as an added precaution against regeneration.

TECHNIC OF OPERATION

The operation is done through a paravertebral incision extending from the lower border of the second rib to the upper border of the sixth rib; whether on the left

27. Meltzer, S. J., and Meltzer, Clara: A Study of the Vasomotor Nerves in the Rabbit's Ear Contained in the Third Cervical and in the Cervical Sympathetic Nerves, *Am. J. Physiol.* 9: 57-68, 1903; The Share of the Central Vasomotor Innervation in the Vasoconstriction Caused by Intravenous Injection of Suprarenal Extract, *ibid.* 9: 146-166, 1903; On the Difference in the Influence upon Inflammation Between the Section of the Sympathetic Nerve and the Removal of the Sympathetic Ganglion, *J. M. Res.* 10: 135-141, 1903; On the Effects of Subcutaneous Injection of the Extract of the Suprarenal Capsule upon the Blood Vessels of the Rabbit's Ear, *Am. J. Physiol.* 9: 252-261, 1903.

28. Elliott, T. R.: The Action of Adrenalin, *Brit. M. J.* 2: 126-130, 1905.

29. Smithwick, R. H.; Freeman, N. E., and White, J. C.: Effect of Epinephrine on Sympathectomized Human Extremity: Additional Causes of Its Failure of Operations for Raynaud's Disease, *Arch. Surg.* 29: 795-797 (Nov.) 1934.

30. Ranson, W. S.: The Anatomy of the Nervous System, Philadelphia, W. B. Saunders Company, 1931, p. 351.

31. Kuntz, Albert: The Autonomic Nervous System, ed. 2, Philadelphia, Lea & Febiger, 1934, pp. 128-140.

32. Heinbecker, Peter: Anatomic and Physiologic Criteria for Surgical Relief of Cardiac Pain, *J. Thoracic Surg.* 2: 517-526 (June) 1933.

33. Leary, Timothy: Coronary Spasm as a Possible Factor in Producing Sudden Death, *Am. Heart J.* 10: 338-344 (Feb.) 1935.

on the right side, the technic is the same. A short portion of each of the third, fourth and fifth ribs is resected; the intercostal muscles are removed; thus the neurovascular bundles are exposed. The sympathetic chain from the second to the fifth dorsal ganglion and their corresponding rami communicantes are then exposed extrapleurally (fig. 3). Lastly, the operation is completed by section of the rami communicantes from

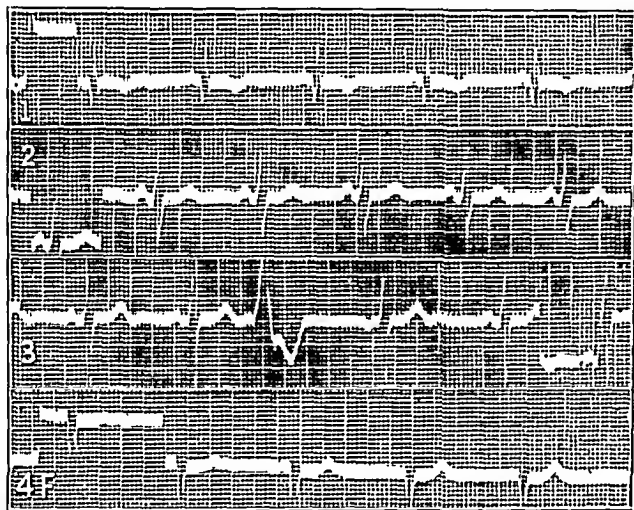


Fig. 5.—Electrocardiograms taken April 23, before the operation. Note particularly the abnormal inversion of the T wave in lead 1.

the intercostal nerves and section of the sympathetic chain between the fifth and sixth dorsal ganglions (fig. 4).

Exceptional care should be exercised in separating the parietal pleura from the vertebral column, since a sudden mediastinal shift from a spontaneous pneumothorax might prove disastrous. Furthermore, a blind approach into the mediastinal structures will almost certainly lead to uncontrollable technical difficulties. To the surgeon experienced in this field these remarks are no doubt unnecessary, but to the novice they should convey the gravity of the situation at hand.

REPORT OF CASES

Eleven patients have been operated on by the procedure outlined. There have been no deaths, and all have obtained complete relief from what had previously been desperate attacks of angina pectoris. The following cases were selected and are presented in detail because they show the results that can be obtained even in the face of other major complicating disorders.

CASE 1.³⁴—Daily attacks of angina pectoris for three years in a middle aged man. Moderate arteriosclerotic hypertensive heart disease and diabetes mellitus. Partial relief by nitrites during attacks. Electrocardiographic evidence of coronary disease. Complete relief from anginal seizures by preganglionic section of rami and trunk.

F. S., a man aged 52, had spent the greater part of three years preceding the operation in the hospital because of daily attacks of angina pectoris. Since the onset he had suffered from five to ten attacks daily. They were partially relieved by nitrites but occasionally morphine was required. The attacks were initiated by a feeling of tightness in the throat and upper part of the chest that rapidly became painful. There was salivation, severe perspiration, oppressive abdominal distention and a fear of impending death. The pain then became agonizing and spread over the precordium and down the ulnar

distribution of the left arm. Palpitation, pallor, a rise in blood pressure and tachycardia were also observed. The attacks were precipitated by slight exertion or emotional stress, and frequently they occurred from the mere anticipation of an attack. He continually kept nitrite tablets on his person; he would not even go to the bathroom without them. For the last eight or nine years he had been suffering from a mild form of diabetes mellitus. This was discovered incidentally to an examination during a siege of pneumonia. Insulin had occasionally been employed, although dietary measures have usually been sufficient.

On examination the blood pressure averaged 150 systolic and 100 diastolic. The retinal as well as the peripheral vessels showed moderately advanced arteriosclerosis. Repeated electrocardiographic examinations gave definite evidence of advanced myocardial damage. On two occasions cardiac decompensation had occurred. The general examination was otherwise negative.

Since the history and examinations indicated that considerable degenerative changes in the myocardium had already taken place, I was somewhat dubious about recommending the operation. The patient, however, was desperate and even after I had explained the danger he still had no hesitancy about accepting the chance of relief. The operation was performed the following day, May 1, 1937. Through a left paravertebral incision a short section was taken from each of the third, fourth and fifth ribs. The parietal pleura was separated from the vertebral column, and the rami communicantes from the second to the fifth dorsal ganglion inclusively were destroyed by electrocoagulation. The sympathetic chain was then sectioned between the fifth and sixth dorsal ganglions.

After two weeks the patient was allowed out of bed but, because of severe myocardial damage, complicated by diabetes mellitus and hypertensive heart disease, was kept in the hospital an additional four weeks for observation. There was no return of anginal seizures. At the time of discharge, moderate exercise was recommended. By the end of four months he was walking from 2 to 3 miles a day. He has faithfully returned at monthly intervals for observation, and when last seen twenty months after operation there had been no return of anginal seizures.

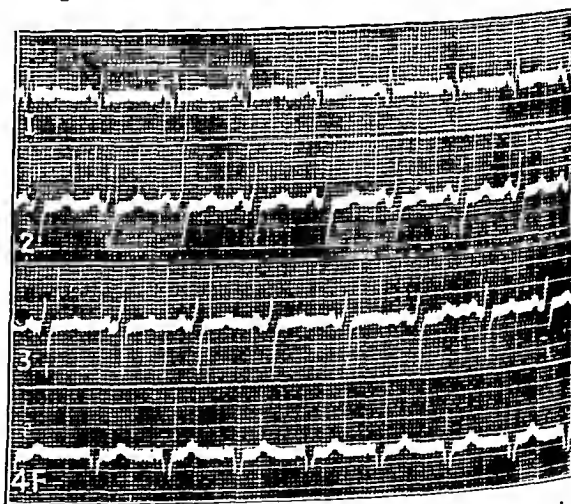


Fig. 6.—Electrocardiograms taken April 27, the second postoperative day. Note particularly the return of the T wave in lead 1 toward normal compared to the record taken four days before.

Here was a patient who almost beyond question was suffering from an advanced degree of coronary sclerosis and most probably had had one or more attacks of coronary thrombosis but was able to obtain temporary relief from the nitrites. It therefore seems reasonable to assume that an abnormal action of sympathetic impulses, on the basis of the principle of reversed action, was responsible for attacks rather than simple

34. This case was cited in a preliminary report read before the California State Medical Association at Pasadena in May 1938.

narrowing of the lumen of the vessels from arteriosclerotic coronary disease presumably present. Moreover, the assumption that the reversed action of sympathetic impulses was responsible for the presumed coronary spasm during attacks seems justified, since the operation gave complete relief. Furthermore, coexisting disease which has been demonstrated in this case obviously was not a contraindication to the operation.

CASE 2.—Frequent attacks of angina pectoris in an elderly man for fifteen months. Temporary relief during seizures by nitrites. General arteriosclerosis, moderate hypertensive heart disease and at least one major attack of coronary thrombosis. Complete relief from seizures by preganglionic section of rami and trunk.

T. H., a man aged 72, had been suffering for the past fifteen months from attacks of distress in the upper part of the abdomen; they usually occurred after eating, exercise or emotional stress and left him in a state of exhaustion. In February 1938, one year after the onset, he suffered a more severe attack, which came on after a game of golf and an evening meal; it started as had the previous ones. The stomach "felt stuffed as though it were filled with mud"; about an hour after the onset pain in the chest developed which radiated into both arms, more markedly on the left side. A physician was summoned and morphine was administered for relief. After a few days the patient felt well except for persisting minor attacks. For these he took nitrite tablets, which gave relief. During the succeeding two months he suffered two additional severe attacks similar to the first; each time relief was obtained by taking nitrite tablets. During the past year the patient had lost 20 pounds (9 Kg.); he starved himself in attempting to prevent attacks.

The past history was of importance, since he had always been nervous and had occasionally suffered from what he called "nervous indigestion." As a young man he had suffered from "nervous spasm in the lower part of the rectum." The attacks had usually occurred while lying down and were relieved on sitting up. For the past five years he had suffered from an anxiety state and episodes of mental depression, during which time he had two "nervous breakdowns."

On examination April 21, 1938, he was poorly nourished; he was 6 feet (183 cm.) tall and weighed 128 pounds (58 Kg.). The pulse rate was 65 beats a minute, the temperature was 98.8 F., and the blood pressure was 150 systolic and 110 diastolic. There was generalized arteriosclerosis, and electrocardiograms repeatedly showed a deep inversion of the T wave in lead I. Roentgenograms of the chest and gastrointestinal tract were negative. The Wassermann reaction of the blood was negative; the blood urea was 16 mg. per hundred cubic centimeters. Routine examinations of the blood and urine were essentially negative. Since medical measures and rest had failed to control the attacks, operation was recommended.

Two days later the patient was admitted to the Hospital of the Good Samaritan for observation prior to operation. The following day electrocardiograms showed changes compatible with coronary disease (fig. 5). That afternoon the patient suffered a sudden attack of abdominal distress and distention; the heart rate became fast and there was a sensation of tightness and weight in the chest and throat; pallor and excessive perspiration on the forehead and upper extremities were observed, and nitrite tablets again afforded relief.

The next morning (April 25) a preganglionic ramisection was done on the left side; the rami communicantes from the second to the fifth dorsal segment of the spinal cord were destroyed by electrocoagulation, and then the sympathetic chain between the fifth and sixth dorsal ganglia was sectioned. During the operation the patient showed no evidence of cardiac embarrassment or other ill effects; Horner's syndrome was not produced.

On the second postoperative day another electrocardiogram was taken which showed the T wave in lead I to have returned toward the normal upright position (fig. 6). The patient's subsequent postoperative course was likewise uneventful. He was dismissed from the hospital at the end of four weeks. When

last seen eight months after the operation he had gained 30 pounds (13.6 Kg.), was taking exercise and had remained free from attacks.

Here again is a patient with angina pectoris and major complications, viz., coronary thrombosis and hypertensive heart disease, yet operation was accomplished without untoward effects and complete relief from the attacks was obtained. Of further interest was the almost immediate change in the electrocardiograms from a pathologic character one day before operation toward a normal character the second day after operation. Although this observation was striking, no conclusions were drawn because they would necessarily be speculative. Other patients having had similar studies made showed no change whatever in the electrocardiograms; however, complete relief from seizures was obtained. Finally, the management of this patient's psychiatric problem was greatly facilitated, not only because of relief from pain and anxiety concerning attacks but also because of improvement in his general physical condition.

SUMMARY

Eleven patients have been treated by the operation here described. There have been no deaths, and all have obtained complete relief from what had previously been desperate attacks of angina pectoris.

The operation is based on the assumption that in angina pectoris the sympathetic action on the coronary vessels is reversed, because of pathologic changes occurring about the myoneural junction; i. e., sympathetic impulses in such cases produce coronary constriction.

Other operations heretofore recommended in the surgical treatment of angina pectoris have given relief at the expense of postganglionic fibers or afferent fibers or both. Such postganglionic operations are subject to the same criticisms that have brought about discard of this type of operation in the surgical treatment of Raynaud's disease. Operations devised to relieve pain by the interruption of afferent pathways are only palliative measures; they remove the warning signal of an impending seizure but do not attack the patient's real trouble.

The operation here described is a preganglionic operation; the major portion of the afferent mechanism is left intact and thus the warning signal is not removed; Horner's syndrome is not produced, and the efferent pathways on the operated side are almost entirely interrupted. A complete interruption of the efferent pathways to the coronary system theoretically would necessarily involve a bilateral operation; however, operation only on the left side is all that has been required to give complete relief from attacks.

727 West Seventh Street.

A Truly Black-Skinned Child.—How this sorting out and recombination of the genes takes place is shown in our accompanying color-plate. We can see by this why a truly black-skinned child can be produced only if both parents carry some Negro-skin-color genes. This should dispose of the old superstition, common in yesterday's fiction, of how a woman with some hidden Negro blood, "passing" as white and married to a White, might give birth to a coal-black baby. Where a black baby does unexpectedly turn up, it can be taken for granted that (a) both parents have Negro ancestry or (b) that the parentage is doubtful. In reverse, it would be equally impossible for a Negress with hidden white blood to be mated with a full-blooded Negro and give birth to a white child.—Scheinfeld, Amram: You and Heredity, New York, Frederick A. Stokes Company, 1939.

CORNEAL EXAMINATION AND SLIT
LAMP MICROSCOPYIN DIAGNOSIS OF LATE CONGENITAL SYPHILIS,
ESPECIALLY IN ADULTS

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AND

ALFRED COWAN, M.D.

PHILADELPHIA

A cornea once involved with interstitial keratitis caused by congenital syphilis presents, almost without exception, certain sequelae which persist for the rest of the patient's life. Although the characteristic signs of an old interstitial keratitis can often be detected by oblique illumination and ophthalmoscopic examination, a proper study should and often can be performed only by biomicroscopy. With the corneal microscope and slit lamp a diagnosis of old interstitial keratitis can invariably be made, regardless of the age of the patient. We believe that the importance of slit lamp examination in clinical syphilology has not been sufficiently emphasized. The changes observed may be the only evidence of congenital syphilis. Their presence in adults and old patients may explain the absence of the history of infection, and they may serve as a means of interpreting positive or weakly positive results of Wassermann or precipitation tests. In the presence of other signs of syphilis a diagnosis of old interstitial keratitis determines the status of infection—congenital syphilis—and therefore has an important bearing on treatment and prognosis.

Briefly, it may be stated that interstitial keratitis is characterized by an infiltration throughout the entire thickness of the cornea, particularly the middle and deep layers, by the formation of blood vessels in the superficial, middle and deep layers (fig. 1) and by the association with uveitis. When caused by congenital syphilis it is always bilateral. As a consequence both corneas remain more or less permanently scarred and vascularized.

It should be emphasized that in many cases of interstitial keratitis the cornea recovers to such an extent that the scarring may be so faint and the remaining blood vessels so few and small that they can be detected only by means of slit lamp microscopy. Furthermore, the location, character and extent of the corneal haze and of the vessels, which are often impossible to determine by the ordinary methods of examination, are extremely important in diagnosis of old interstitial keratitis. The remains of a previous uveitis may be and often are detected only by slit lamp microscopy.

Regardless of the extent of involvement of the cornea, it is possible to make an almost certain diagnosis of a previous interstitial keratitis in nearly every case and after any length of time. One experienced in slit lamp microscopy can generally differentiate other forms of interstitial keratitis from the syphilitic type. When caused by syphilis the cornea presents a classic slit lamp picture.

EXAMINATION OF THE CORNEAS OF PATIENTS
WITH OLD INTERSTITIAL KERATITIS

The corneas of 100 patients who had interstitial keratitis were inspected grossly, by oblique illumination, and were examined with the ophthalmoscope and

by slit lamp microscopy to demonstrate evidence of old interstitial keratitis. The patients were both children and adults. The age range was from 6 to 65 years. The majority were under 30. Ninety-three of the patients had been patients in Wills Hospital at the time their interstitial keratitis was active. Corneal examination for old evidence of interstitial keratitis was made on these former patients from one to twenty years after the onset of interstitial keratitis. For seven patients the interval was still longer, in some cases as long as fifty years. Some of these patients had no knowledge of ever having interstitial keratitis, but they were included in the series since they showed by slit lamp microscopy the classic picture of old interstitial keratitis.

The corneas were inspected grossly to determine the presence of opacities. Inspection by oblique illumination facilitated seeing corneal opacities. Ophthalmoscopic examination was performed with the plus 20 lens in order to see old blood vessels and corneal opacities, which are sequelae of interstitial keratitis. If blood vessels were not seen with the pupil undilated, examination was repeated after dilating the pupil. Dilatation may be necessary in order to see vessels present only toward the periphery of the cornea. In some cases corneal opacities not seen on gross inspection or by oblique illumination were visible only after the pupil had been dilated and examined with the ophthalmoscope



Fig. 1.—Section through the cornea as seen with a narrow slit of light in biomicroscopy. The direction of the vessels actually seen is perpendicular, not horizontal as is indicated in the drawing. The portion of the vessel that seems to terminate in front indicates the depth, or the plane of the cornea in which the vessels lie. In interstitial keratitis vessels lie in any deep plane.

when the eye was turned in different directions. Old blood vessels as seen through the ophthalmoscope appear as black threads against the red fundus reflex (fig. 2). They resemble scratches on a glass surface and are commonly referred to as brushlike. Usually they are numerous and are scattered throughout the cornea; at times they number only a few and, as aforementioned, are confined to the periphery. Of course other pathologic processes, notably interstitial keratitis of other than syphilitic origin, that are later evidenced by opacities and old blood vessels should be considered in differential diagnosis. Although it is not our purpose to discuss differential diagnosis, it may be briefly stated that the history, the location of the opacity and the arrangement of the vessels are differentiating features. Slit lamp microscopy may be necessary for differential diagnosis.

In the cases studied, the ordinary methods of examination, as far as they concerned opacities and old blood vessels, did not always confirm the microscopic view in

From the Wills Hospital.
Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

the slit lamp examination. In this examination opacities were present that were not apparent on gross inspection and old blood vessels were seen that could not be seen with the ophthalmoscope.

With the plus 20 lens of the ophthalmoscope, old blood vessels could be seen in corneas that had or had not gross opacities. Ophthalmoscopic examination is therefore more reliable than is gross inspection in diagnosis of old interstitial keratitis. On the other hand, corneas that were grossly clear, and in which blood vessels or other faint sequelae of interstitial keratitis were missed when examined by the ophthalmoscope and by oblique illumination, presented by slit lamp microscopy aforementioned changes that justified a diagnosis of old interstitial keratitis. Slit lamp microscopy is therefore more reliable in diagnosis of old interstitial keratitis than is study by oblique illumination and the ophthalmoscope. We are unacquainted with reports of studies of slit lamp microscopy in patients with old interstitial keratitis as an aid in diagnosing congenital syphilis. It is well known that opacities resulting from interstitial keratitis may persist indefinitely, and ophthalmologists are cognizant of the fact that residual blood vessels usually remain permanently. Igersheimer¹ recorded the statement that folds in Descemet's membrane arising from descemetitis accompanying interstitial keratitis may remain for the rest of the patient's life, and Ronné,² in referring to corneal opacities, referred to "not a few cases where at a later stage, by the help of the residual maculae cornea, I have diagnosed congenital syphilis."

Case 1 concerns a 49 year old woman who presented the type of folds in Descemet's membrane to which Igersheimer referred. Other changes seen by slit lamp microscopy were regarded as diagnostic of interstitial keratitis.

CASE 1.—A Negro woman aged 49 came to the eye clinic on account of poor vision. She was married and had had one miscarriage; there were no living children. She was the third born of a family of four. Both eyes were "sore" at about the age of 7 and remained inflamed for about three months. She received only local treatment to the eyes. She had no knowledge of ever receiving antisyphilitic treatment.

She had no stigmas of congenital syphilis. On gross inspection both corneas showed scattered fine opacities and old blood vessels by ophthalmoscopic examination. The vision of the right eye with correction was 6/60 and of the left eye with correction was 1/60. The Wassermann reaction was 44—; the Meinicke reaction was 4 plus.

The diagnosis of old interstitial keratitis with uveitis was made by slit lamp examination. The corneas were thinned, irregular and hazed throughout with considerable increase in relucency in the posterior portions. There were numerous folds, wrinkles and ruptures in Descemet's membrane. There were numerous blood vessels in the cornea and precipitates on the posterior surface of the cornea. The iris was atrophied and showed a few small synechiae.

CLINICAL APPLICATION OF SLIT LAMP MICROSCOPY IN DIAGNOSIS OF CONGENITAL SYPHILIS

Slit lamp examination in diagnosis of old interstitial keratitis as evidence of congenital syphilis is of most value in the clinical examination of adults whose Wassermann or precipitation reactions are in some degree positive, without history of infection and with-

out other evidence of congenital syphilis. Such examination of children with stigmas of congenital syphilis and positive Wassermann reactions is of course not necessary. However, in such patients, in the absence of corneal opacity and of history of "sore eyes," slit lamp examination definitely determines whether the cornea has or has not been involved with interstitial keratitis.

The diagnosis of old interstitial keratitis by slit lamp microscopy is valid evidence of congenital syphilis.³ Of course a diagnosis of congenital syphilis in an adult interprets the positive Wassermann reaction and defines the status of infection, which is necessary for proper treatment of syphilis. This is illustrated in case 2, which concerns a 58 year old patient who had objective signs of tabes and a 4 plus Wassermann reaction. Slit lamp microscopy established the diagnosis of old interstitial keratitis. The administration of antisyphilitic treatment to this patient would be of questionable value.⁴

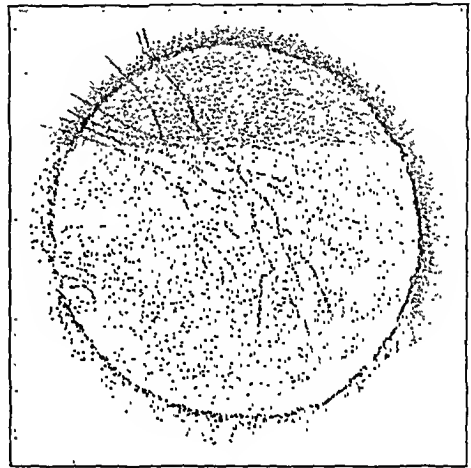


Fig. 2.—Blood vessels in the cornea after interstitial keratitis as they appear with the ophthalmoscope against the reflex light from the retina.

CASE 2.—A man aged 58 came to the clinic because of poor vision. He had always had poor eyesight and had worn glasses for many years. He was an only child. He remembered having sore eyes when a child but could not recall any details. He stated that he had never had a genital lesion. After a "blood" test ten years before he received injections in the arm at intervals for three months.

The pupils were unequal and irregular in outline. The right pupil was fixed to light. The left reacted slightly to light.

3. Interstitial keratitis occurring in acquired syphilis is extremely rare. Although it has been reported, we have never observed a case. Such of the reported cases as we reviewed we did not regard as valid since slit lamp examination was apparently not performed. Other conditions that resemble interstitial keratitis were therefore not definitely excluded. Igersheimer stated that when syphilis is acquired in early childhood symptoms characteristic of congenital syphilis may later appear. He held that in such patients interstitial keratitis first appears in adult or late adult life. Such occurrence is apparently included in the following statistics as to the ratio of interstitial keratitis in acquired and in congenital syphilis. Grounew stated that the ratio is 1:133; Igersheimer gave 1:247; and in Adamantiadis' series it was 3:1,000 (for further discussion see Igersheimer.¹ Granstrom, K. O.: Die Keratitis Parenchymatosa in späterem Alter, *Acta Ophth.* 12:122, 1934. Adamantiadis, B.: Kératite pustuliforme profonde et les diverses formes de la kératite parenchymateuse syphilitique acquise, *Ann. d'ocul.* 172:304 [April] 1935).

4. As a principle of treatment in patients with late congenital syphilis, it may be stated that the higher the age when the disease is first discovered, the less the indication for the administration of syphilitic therapy. The chief hazard of congenital syphilis is interstitial keratitis. After the age of 20 its incidence greatly decreases. The transmission of the infection from persons with congenital syphilis to their progeny—third generation syphilis—is rare. The prognosis of congenital syphilis in adults in relation to the occurrence of cardiovascular involvement and neurosyphilis is not pertinent, as it is for patients of the same age with acquired syphilis.

1. Igersheimer, Josef: Syphilis und Auge, in Jadassohn, Josef: *Handbuch der Haut- und Geschlechtskrankheiten*, Berlin, Julius Springer, 1928, vol. 12.

2. Ronné, Henning: Treatment of Tardive Congenital Syphilis Seen in Social Light, *Acta Ophth.* 12:215-219, 1934.

Gross inspection of the corneas showed faint opacities. The vision with correction was right eye 6/15, left eye 6/30. On slit lamp examination of the right eye the central portion of the cornea was gray with a moderate loss of smoothness. The posterior surface was thickened and fairly opaque and contained a number of old blood vessels deeply situated. Examination of the left eye showed essentially the same features.

The patellar reflexes were absent and the Romberg sign was positive. The patient presented no stigmas of congenital syphilis and had no subjective symptoms of tabs. The Wassermann reaction of the blood was 4 plus and the Meinicke reaction 2 plus. The spinal fluid examination yielded negative results in all phases.

With regard to the value of slit lamp examination in the study of adults, the following comments are pertinent. The incidence of congenital syphilis in the general population, as given by different writers, ranges from 0.5 to 3 per cent and the incidence of interstitial keratitis among patients with congenital syphilis ranges from 25 to 50 per cent.

It is a remarkable fact that many patients who have had interstitial keratitis cannot in later life remember ever having had "sore eyes." It is to be recalled that interstitial keratitis may occur as early as the age of 1 year and that it may pursue, even in the absence of treatment, a mild course, retrogressing without the occurrence of corneal opacities and without much impairment of vision.

Patient 3 had no knowledge of having had interstitial keratitis. There were no stigmas of congenital syphilis. The presence of corneal opacity suggested old interstitial keratitis. Slit lamp microscopy confirmed the diagnosis.

CASE 3.—A man aged 32 was seen by one of us (J. V. K.) in the surgical ward of a hospital. He had a fractured femur. The Wassermann test routinely conducted showed a 2 plus reaction. He denied ever having a genital lesion; he had no knowledge of ever having "sore eyes" or receiving antisyphilitic treatment or a previous blood test. He had no stigmas of congenital syphilis. On examination for evidence of syphilis a faint opacity of the cornea was noted. The diagnosis of old interstitial keratitis was made by slit lamp examination.

A considerable percentage of patients with congenital syphilis do not have any of the well known stigmas of their disease. In studies⁵ of such stigmas among patients with interstitial keratitis it was observed that 17.5 per cent had hutchinsonian teeth, 29 per cent had chronic periostitis of the tibia (saber-shaped, or Fournier's, tibia), 45.5 per cent had the physiognomy of congenital syphilis and 18 per cent had symmetrical serous synovitis (Clutton's joints). It is to be recalled that these stigmas are less likely to be recognized or are absent in adults. Clutton's joints are seen only in children. Hutchinsonian teeth may have been extracted, or their notched surfaces, through use, are less apparent. The physiognomy of congenital syphilis is less typical in adults, especially after middle age.

A number of patients with congenital syphilis attain adult life without evidence of their infection except a positive Wassermann reaction. Such patients deny all knowledge of infection. It is well known that patients with acquired syphilis may give no history of infection. A certain percentage, therefore, of adult patients whose Wassermann reactions are positive and who are without history of infection are congenitally syphilitic. In a certain percentage of this group corneal examination in

the manner herein discussed may be the means of diagnosing or confirming a diagnosis of congenital syphilis.

CASE 4.—A girl aged 10 was first seen in April 1937, with interstitial keratitis of the right eye which pursued a mild course. There were no stigmas of congenital syphilis. The Wassermann reaction was 4 plus. Antisyphilitic treatment was administered. Interstitial keratitis which subsequently appeared in the left eye was mild and of short duration.

Twenty-two months after the patient was first seen the corneas were grossly clear. A former opacity of the right cornea had disappeared. Small opacities confined to the upper portion of both corneas were visible only with the ophthalmoscope and with the pupil dilated. A few blood vessels were seen in the left eye. The vision in both eyes was 6/9 and the Wassermann reaction was still 4 plus.

On slit lamp examination of the right eye the posterior portion of the cornea, particularly in the center, was increased in relucency. Also in the posterior portion of the stroma there was an irregular area of thin opacities. There were some deep vessels above. The anterior chamber was clear. The iris was intact. Examination of the left eye showed essentially the same changes.

There are few reported studies showing how long the Wassermann reaction of patients with congenital syphilis remains positive. In Saul's⁶ series of eighty-one patients with old interstitial keratitis reexamined from thirteen to twenty-eight years later the Wassermann reaction of sixty-five was positive and of the rest negative.

In our observation of patients in late adult life with congenital syphilis for whom the diagnosis of old interstitial keratitis was made, the Wassermann reaction was variable. It ranged from negative to strongly positive. Apparently, therefore, the positive Wassermann reaction of congenital syphilis may remain positive throughout the patient's life in treated as well as untreated patients (cases 1, 2, 3, 6). On the other hand it may become negative even in the absence of treatment. The following record of a case serves as an illustration:

CASE 5.—E. W., a white woman aged 27, unmarried, was the third child of a woman receiving antisyphilitic treatment in the clinic. The mother had had no miscarriages or stillbirths. She had three sons and a daughter (E. W.) who had "sore eyes" when a child. Both the daughter's eyes were involved for about a year and apparently only local treatment was administered. The patient was frail and underweight. She had no subjective complaint and had no knowledge of ever having received antisyphilitic treatment. There were no stigmas of congenital syphilis. The Wassermann and Meinicke reactions of her blood were negative. Diagnosis of old interstitial keratitis was made by slit lamp examination. This examination showed old blood vessels running from the limbus toward the center of the cornea, through which blood was circulating. There were numerous scattered punctate deposits in the deep layers of the cornea and a general haziness throughout.

One older and one younger brother showed no evidence of congenital syphilis on clinical and serologic examination.

The patient showed how benign a course congenital syphilis can pursue. Slit lamp microscopy definitely established old interstitial keratitis, which diagnosis was suggested by the history of "sore eyes" and the fact that her mother was syphilitic.

We believe that every patient who has had interstitial keratitis will subsequently present, probably permanently, a diagnostic picture of old interstitial keratitis by slit lamp examination. This picture constitutes in one sense a stigma of congenital syphilis.⁷

6. Saul, Hugo: Ueber das Schicksal der Patienten mit Keratitis parenchymatosa, *Ztschr. f. Augenh.* 86: 199 (June) 1935.

5. Klauder, J. V., and Robertson, H. F.: Symmetrical Serous Synovitis (Clutton's Joints), Congenital Syphilis and Interstitial Keratitis, *J. A. M. A.* 103: 236-240 (July 28) 1934.

7. What are popularly called the stigmas of congenital syphilis refer fundamentally to structural changes of a permanent nature such as hutchinsonian teeth and saber-shaped, or Fournier's, tibia. According to this concept Clutton's joints and ocular changes caused by interstitial keratitis would not be included.

Patient 6 presented on gross and ophthalmoscopic examination evidence of old interstitial keratitis, more definitely revealed, however, by slit lamp microscopy.

CASE 6.—A man aged 65 complained only of poor vision, for which he came to the clinic for refraction. He was the oldest of a family of seven, of whom six were living. His wife had had many miscarriages but only one child, who died at the age of 3. He stated that he had never had a genital lesion. He had no knowledge of having "sore eyes" when a child or of ever having received antisiphilitic treatment.

Results of the general physical examination were essentially negative. The teeth were absent. There were no stigmas of congenital syphilis. Both corneas on gross inspection showed faint opacities and old blood vessels by ophthalmoscopic examination. The vision of the right eye was 6/30, with correction 6/21, and of the left eye 6/60, with correction 6/30. Positive diagnosis of old interstitial keratitis was made by slit lamp examination. Throughout the entire corneas of both eyes there were opacities of varying densities, particularly in the upper portions. There were some deep blood vessels. The aqueous was clear and the iris was intact.

Repeated examination of the blood showed a 1 plus and a 2 plus Wassermann reaction and a 2 plus Meinicke reaction.

The clinician and the syphilologist should be conscious of the cornea and the sequelae of interstitial keratitis as herein discussed when examining children and adults suspected of having or known to have syphilis. Inspection of the cornea for opacity, even though faint, of which the patient may not be cognizant, and examination by oblique illumination and also with the plus 20 lens of the ophthalmoscope are clinical procedures easily conducted. These examinations may suggest the more valid means of diagnosing old interstitial keratitis—slit lamp microscopy. In the exclusion of congenital syphilis in a patient of any age, examination is not complete unless slit lamp microscopy has been performed. A negative outcome of this examination is evidence that the patient has not had interstitial keratitis, though of course it does not prove the absence of congenital syphilis.

1934 Spruce Street—1930 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. JAMES R. DRIVER, Cleveland: The paper of Drs. Klauder and Cowan brings to our attention an important diagnostic method for the recognition of certain eye symptoms in late congenital syphilis. The use of the slit lamp in the examination of the cornea in syphilitic patients is of course not new. However, I agree with the authors that in the past this procedure has been neglected by syphilologists. I know of no textbook on syphilis that mentions or recommends its use. We as syphilologists must depend on the ophthalmologists for the examination and largely the interpretation of these observations. We have here an example of the importance of the close cooperation which the syphilologist must have with all other branches of medicine if the best in diagnosis and treatment of syphilitic patients is to be achieved. For two years at the University Hospital in Cleveland we have been using slit lamp microscopy as a routine procedure in the examination of all cases of congenital syphilis and in suggestive cases. More than sixty cases of congenital syphilis have been examined so far. In discussing the work with Dr. L. V. Johnston, who has made all of the examinations, I find that he agrees with the authors that (1) there are instances in which it was possible to make a diagnosis of old healed interstitial keratitis when oblique illumination and ophthalmoscopic examination failed to reveal its presence and (2) the picture of old interstitial keratitis as seen by the slit lamp is almost pathognomonic of the disease. The authors brought out, and I agree, that all patients with unexplained positive serologic tests either of the blood or of the spinal fluid should have their corneas examined by the slit lamp. In this way late congenital syphilis may be diagnosed in patients show-

ing perhaps no other stigmas of the disease. Of course, it is taken for granted that slit lamp examination simply supplements complete ophthalmoscopic study for other evidences of the disease in the eye. The paper deals only with the subject of late changes due to interstitial keratitis. I should like to mention that in our work with the slit lamp we have found its use valuable in giving a prognosis for patients showing active interstitial keratitis. Parents, guardians or social agencies want to know whether the individual so affected will be able to see. Plans for the future must often be made in advance. Now, since the character and severity of the disease can best be determined by slit lamp examination, this becomes easier. We have found that in several cases in which the cornea is thickened, owing chiefly to edema, even in the presence of much exudate the prognosis is good provided there is not extensive vascularization of the cornea.

DR. JOHN McLEOD, Kansas City, Mo.: At the clinic for congenital syphilis in the Children's Mercy Hospital in Kansas City we have used the slit lamp in a large number of cases as an aid in the diagnosis and prognosis of congenital syphilis. We have found that slightly vascularized opacities offer much better prognosis than those more heavily vascularized. It must be remembered that treatment of interstitial keratitis by hyperpyrexia may produce complete clearing of the cornea in occasional cases, so that even in a relatively short time thereafter no traces are evident. Rigorous slit lamp examination of the cornea six months after the subsidence of the disease may show absolutely nothing. In most cases there are associated with the keratitis certain other ocular stigmas, of some of which a directly syphilitic origin is uncertain. Among these may be mentioned the filming or veiling of the iris, described by Lemoine in 1934, consisting of a very fine veil, probably of connective tissue, over the entire iris and filling up the crypts. This is common in interstitial keratitis and in juvenile tabetic dementia paralytica, the type of patient in which one sees an enlarged vertically oval pupil fixed to light and accommodation but reacting to drugs. Our records, dating back to about 1916, show an incidence of interstitial keratitis of something over 5 per cent. In 24 per cent of these, I think, the spinal fluids have been positive. In practically all there has been some other ocular stigma of syphilis: typical syphilitic chorioretinitis, veiling of the iris, adhesions between the iris and lens or some of the minor fundus changes. These minor fundus changes vary from the so-called salt and pepper fundus on up through the peripheral chorioretinitis which is frequently associated with interstitial keratitis and, on the other hand, downward to almost complete normality, with a little more than normal pigmentation around the periphery of the retina. In using the slit lamp for the diagnosis of syphilis, one must bear in mind that tuberculosis produces a keratitis which may in its late stages resemble closely syphilitic interstitial keratitis. The recommendation for the use of the slit lamp as an aid in diagnosis of old congenital syphilis is excellent, but its use should be combined with a complete ophthalmoscopic and perhaps perimetric examination of the eye as well.

DR. JOSEPH V. KLAUDER, Philadelphia: The slit lamp should be used in study of all cases of interstitial keratitis. In fact, I think it is the court of final appeal in the diagnosis of the disease. I do not believe that the diagnosis of interstitial keratitis can be made in 100 per cent of cases by other methods. That has been apparent in the number of cases we see at the Wills Hospital in Philadelphia. I do not believe that slit lamp microscopy in the acute stage of interstitial keratitis is always helpful in making a prognosis. It is well known that opacities in the acute stage disappear to a variable degree, at times to a considerable degree, so that the end result is unexpectedly good. Poor vision after interstitial keratitis does not alone concern residual blood vessels or opacities, of course excepting leukoma. An important factor is the disturbance of the normal contour of the anterior and posterior surfaces of the cornea. Patients in adult life frequently do not recall their interstitial keratitis of childhood. The absence of history of "sore eyes" may not have any significance. Moreover, it is thought by some that interstitial keratitis may occur in intra-uterine life. It would be interesting to examine by slit lamp microscopy the oldest child of parents with syphilis. I say the oldest child, since interstitial keratitis is more likely to appear in the first born.

CARDIAC ASTHMA AND ACUTE PULMONARY EDEMA COMPLICATING TOXEMIAS OF PREGNANCY

FURTHER OBSERVATIONS

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AND

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Recently we called attention to an interesting and dramatic symptom complex which occasionally complicates the severe nonconvulsive toxemias of pregnancy.¹ It is characterized by the sudden appearance in a previously comfortable patient of extreme orthopnea, dyspnea, cyanosis and cough productive of frothy and often pinkish sputum. Numerous crepitant rales appear with the onset of the attack, and they persist, at least in the lung bases, for a variable period thereafter.

Attacks have usually occurred in patients while at rest in bed. They closely resemble severe attacks of cardiac asthma such as occur characteristically in non-pregnant persons with conditions that impose a burden on the left ventricle, notably severe hypertensive disease, aortic insufficiency and nephritis with hypertension.

We referred to this complication of nonconvulsive toxemias of pregnancy as "cardiac asthma and acute pulmonary edema." It has been encountered only in patients with severe toxemia. Hypertension, albuminuria and edema, all of marked degree, were present in all cases for two or more weeks preceding the first seizure.

In our original report, the suggestion was made that the mechanisms of origin of the pulmonary edema in these cases and in eclampsia were similar or identical and that this mechanism is essentially left ventricular heart failure. It was also pointed out that a background of vascular hypertension is often found in toxemic patients who develop this symptom complex. However, six cases were reported in which cardiac asthma and acute pulmonary edema complicated simple acute preeclampsia without a background of cardiovascular or renal disease.

During the past two years we have had subsequent opportunity to observe a number of toxemic patients in whom this complication has developed. In this communication we present certain observations on the clinical nature and pathologic physiology of such attacks, as illustrated by several case histories. In contrast to the cases previously reported, these patients had backgrounds of some degree of hypertensive disease, although none have had attacks resembling paroxysmal dyspnea or cardiac asthma except during the latter half of pregnancy, when the superimposition of toxemia of pregnancy resulted in exaggeration of the hypertension with the appearance of generalized edema.

That the increase in hypertension accompanied by the appearance of marked albuminuria and edema in these patients indicated the superimposition of preeclampsia on hypertension, rather than renal insufficiency or progression of their vascular disease, is indicated by the observation that none of them had

significant azotemia and all were able to concentrate urine normally. That we are justified in terming the condition preeclampsia is also indicated by the fact that, coincident with the attacks, these patients showed the marked sudden changes of hemoconcentration and other conditions found on laboratory examination which are characteristic of this disease. In one of these cases, after repeated severe attacks of cardiac asthma with acute pulmonary edema there developed severe headache, temporary amblyopia, torpor and marked rapid hemoconcentration following a typical eclamptic convulsion. We present this patient's history in some detail:

CASE 1.—K. C., aged 39, was admitted to the Boston Lying-in Hospital Nov. 3, 1937, in the twenty-ninth week of her eleventh pregnancy with the history of three severe attacks of paroxysmal dyspnea and manifestations of marked hypertension, albuminuria and edema.

The family history revealed that her mother and one sister had hypertension.

There was nothing in the past history to suggest glomerulonephritis or pyelonephritis. There had been ten previous pregnancies, of which the first four were entirely normal. The last six pregnancies had been complicated by mild asymptomatic hypertension without significant albuminuria or edema. The maximum blood pressure recorded was in the fifth pregnancy, when it was once found to be 160 systolic and 110 diastolic. The sixth pregnancy ended in spontaneous abortion, but all others ended in term deliveries of large live babies.

The patient has been examined between pregnancies three times in this clinic during the last seven years. At these examinations the blood pressure was found to be from 140 to 150 systolic and 100 diastolic. Except for slight obesity, there were no other abnormalities. At each examination the urine contained no albumin. Her subjective health had been excellent with no cardiovascular or renal symptoms, in spite of the fact that she did all the housework for a family of nine.

The last menstrual period began April 15, 1937. Except for a little more than usual nausea and vomiting during the second month, this pregnancy progressed asymptotically up to the twenty-fourth week, when the patient first noticed edema involving the face, hands and feet. When the edema had persisted for about two weeks, she began to drink large amounts of water, up to twelve or more glasses a day, on the advice of a friend who was a nurse. Several days after the adoption of this policy she was awakened at 4 o'clock in the morning with a severe and frightening choking sensation. The attack was characterized by extreme orthopnea and dyspnea, cough and difficulty with expiration. "I had to sit up to get my breath. A wall seemed to come right up over my chest and I couldn't breathe. It seemed as if each breath would be my last." The acute distress lasted some two hours, during which time members of the family tried to persuade her to lie down, but she "had to sit up." She remained in bed for twenty-four hours, after which she resumed her duties about the house. The forcing of fluids was discontinued for about a week, because the patient was afraid to resume it, having associated it with her attack of cardiac asthma. However, at the insistence of her family and the nurse, the forcing of fluids was resumed. After several days there was a second attack, which came on while she was resting about an hour after dinner. This episode was essentially like the first one, but it was some five hours until the extreme dyspnea and orthopnea were gone. The next day the patient was up and about again. Indeed, she stated that she was afraid to go to bed or lie down. Five days later there was a third attack. This time she sat in a chair with her head resting on a table for the first hour. She found this position decidedly more comfortable. Next day she reported to the clinic for the first time.

The patient was large, well developed and dyspneic, with moderate generalized edema. There was no cyanosis, and the heart moderately enlarged and the rhythm normal and there was a systolic murmur over the precordium. The blood pressure was 230 systolic, 160 diastolic. Auscultation of the lungs revealed numerous crepitant rales at both bases, extending above the

From the Department of Obstetrics of Harvard Medical School and the Boston Lying-in Hospital and the Department of Child Hygiene of the Harvard School of Public Health.

1. Teel, H. M.; Reid, D. E., and Hertig, A. T.: Cardiac Asthma and Acute Pulmonary Edema. Complications of Nonconvulsive Toxemia of Pregnancy, Surg., Gynec. & Obst. 64: 39 (Jan.) 1937.

midscapular and midaxillary regions. The liver was neither enlarged nor tender, and the uterus was consistent in size with a scant seven months pregnancy. The urine showed 4 plus albumin.

The patient was admitted to the hospital and placed on a regimen of fluid restriction, and digitalization was begun. There was a mild attack of cardiac asthma the first night. Although she lost 6 pounds (2.7 Kg.) during the first twenty-four hours, rales persisted at the lung bases. On the second hospital day, a 7 foot x-ray plate of the chest showed the heart considerably enlarged in its transverse diameter and diminished radiance of both lung bases with haziness of the costophrenic angles.

The vital capacity, as determined on the second hospital day after subsidence of the acute seizure, was 1,700 cc.² Retinoscopy revealed blurring of the disk margins and patches of "cotton wool" exudate. The arteries were constricted and the veins overfilled, but there were no hemorrhages.

On the morning of the third hospital day, the patient awakened with severe frontal headache and blurred vision. The condition grew worse, and in the afternoon she became irrational. A lumbar puncture was done, and clear fluid under 300 cm. of water pressure was obtained. Withdrawal of 30 cc. reduced the pressure below 150 cm. of water.

Forty minutes following the lumbar puncture there was a typical eclamptic convulsion. Magnesium sulfate given intravenously resulted in prompt improvement, and repetition controlled the patient's irritability and symptoms. Forty-eight hours later labor was induced and a stillborn 2 pound 1 ounce infant (935 Gm.) was delivered spontaneously. Subsequent recovery was rapid; within three days the lungs were free from rales and the vital capacity had risen to 2,700 cc. At the time of her discharge from the hospital on the fourteenth postpartum day there was neither dyspnea nor orthopnea, the blood pressure was 160/100, the urine contained 1 plus albumin, and the vital capacity was 2,850 cc.

This patient has been seen several times during the six months since delivery. She has no cardiac, vascular or renal symptoms and has resumed all the housework for a family of nine. The blood pressure is 140 systolic, 90 diastolic and the urine is free from albumin. Repetition of the 7 foot x-ray plate of the heart shows no enlargement in the transverse diameter, although there is a slight aortic knob.

The maximum value for nonprotein nitrogen in the blood was 40 mg. per hundred cubic centimeters ante partum and 43 mg. one week post partum. Blood uric acid ante partum was 4 mg. per hundred cubic centimeters. Of considerable interest is a sudden change in hemoconcentration, which occurred at the time of the convulsion. The hematocrit reading a few hours before the convulsion was 29.99 per cent. Shortly after the convulsion the hematocrit reading was 39.50 per cent. At the time of her discharge from the hospital fourteen days post partum the hematocrit and hemoglobin values were respectively 34.37 per cent and 10.4 Gm. We have repeatedly observed these sudden marked shifts in hemoconcentration in other patients with eclampsia, particularly when complicated by pulmonary edema.

This patient's history is presented to illustrate the occurrence of severe cardiac asthma with acute pulmonary edema as a complication of preeclampsia superimposed on mild asymptomatic hypertensive disease. That the marked increase in blood pressure, edema and albuminuria were fairly interpreted as preeclampsia was confirmed by the facts that the patient subsequently had a typical eclamptic convulsion without evidence of renal

failure and that she recovered promptly following termination of the pregnancy. We would emphasize that the patient has never suffered from cardiac symptoms and has never had an attack suggestive of nocturnal or paroxysmal dyspnea before or since the pregnancy described.

The specificity of pregnancy toxemia in causing cardiac asthma with acute pulmonary edema in a previously and subsequently well compensated hypertensive patient is better illustrated by the following case:

CASE 2.—F. M., aged 38, was admitted to the hospital in the fifth month of her ninth pregnancy because of severe hypertension, edema and history of recurrent attacks of paroxysmal dyspnea for two weeks.

The patient was known to have had an elevated blood pressure for at least six years. Her last pregnancy eighteen months before had been terminated in the sixth month in another hospital because of a severe toxemia of pregnancy complicated by seizures of dyspnea and orthopnea. Recorded conditions prior to termination of the pregnancy were essentially massive peripheral edema, numerous crepitant rales, a blood pressure of 260 systolic, 140 diastolic, and 4 plus albumin in the urine. Following termination of the pregnancy there was prompt improvement with disappearance of dyspnea, albuminuria and edema and decrease in blood pressure.

At repeated examinations during the eighteen months between this pregnancy and the present one, the blood pressure ranged from 180 to over 200 mm. of mercury systolic, but there was no edema, and there had been no further seizures of dyspnea and no other symptoms referable to the heart.

The present pregnancy had progressed without incident until two or three weeks before examination, when generalized peripheral edema appeared. Some days later the patient began to have recurrent seizures typical of cardiac asthma with cough productive of frothy sputum.

Examination revealed essentially peripheral edema, dyspnea, cardiac enlargement, numerous crepitant rales over the lower lobes of both lungs and a blood pressure of 240 systolic, 160 diastolic. The urine did not contain albumin.

The patient was placed on a regimen of restricted fluid intake and digitalized, and the pregnancy was terminated by abdominal hysterotomy and sterilization. There was rapid marked improvement with disappearance of peripheral edema, dyspnea and signs of pulmonary edema and decrease in blood pressure. The patient was discharged seventeen days post partum with no signs or symptoms of cardiac decompensation.

The patient has been followed for eighteen months since delivery. The blood pressure ranges from 180/110 to 240/120 and she has considerable headache, but the lung bases have remained clear and she has had no recurrence of the seizures of paroxysmal dyspnea.

This patient is the only one in our series without marked albuminuria who has had typical cardiac asthma appear for the first time as a complication of toxemia of pregnancy. It should be added that her antecedent hypertensive disease was the most marked of any patient in the series. The point of particular interest to us is that, although she is known to have had marked hypertension for six years, she has never suffered from seizures of cardiac asthma or pulmonary edema except as described in the last two pregnancies, when marked increase in blood pressure, edema and (in the first pregnancy) albuminuria indicated the superimposition of preeclampsia.

The third case illustrates the futility of prolonged expectant treatment when attacks of cardiac asthma with acute pulmonary edema have occurred in the course of severe toxemia of pregnancy.

CASE 3.—M. B., a quintipara aged 37, was transferred from another hospital to this clinic in the thirty-sixth week of pregnancy because of toxemia complicated by marked choking sensations, dyspnea and orthopnea.

2. We have determined the vital capacity on a number of these patients with immediate cardiac asthma or between attacks. The procedure is the maximum, and the first effort invariably gives the maximum. In one subject an immediate seizure of cardiac asthma with acute pulmonary edema followed determination of the vital capacity.

She was known to have had some degree of toxemia with her last two pregnancies. Her family physician knew that her blood pressure was definitely above normal early in the present pregnancy. In the seventh month of pregnancy there was a definite increase in the blood pressure, with the appearance of edema of the lower extremities and albuminuria. Simultaneously the patient began to have attacks of nocturnal dyspnea and was obliged to lead a bed and chair existence. On admission to a private hospital two weeks later the blood pressure was 200 plus systolic and from 100 to 120 diastolic, and the urine

showed 4 plus albumin. Over a period of two weeks she was observed by her physician to have several attacks of nocturnal dyspnea during which the chest was full of fine and coarse rales. She was digitalized.

On admission to this hospital, physical examination revealed the following: The patient was frail, with marked orthopnea and cyanosis. There was only a slight degree of peripheral edema. The blood pressure was 220/140 and there was marked sclerosis of the

The patient was large and edematous, weighing 214 pounds (97 Kg.), and had moderate cyanosis. The blood pressure was 194/118. Auscultation of the chest revealed fine to coarse rales throughout. While the patient was being turned to facilitate examination, a severe attack of acute pulmonary edema developed. Several hours later the vital capacity was found to be 1,820 cc. Immediately following this procedure the patient was seized with a second similar attack of orthopnea and dyspnea, with marked exacerbation of pulmonary edema. A 7 foot x-ray plate of the heart taken at this time and repeated nine weeks post partum indicates the degree of pulmonary edema and cardiac dilatation associated with these episodes of acute pulmonary edema (figs. 1 and 2).

The urine contained 4 plus albumin. There were numerous white blood cells, occasional red blood cells and granular casts in the sediment. Chemical examination of the blood was negative except for a total protein value of 5.77 Gm. per hundred cubic centimeters.

The patient was given morphine in liberal doses. Fluids were restricted and she was rapidly digitalized. She was delivered by cesarean section twenty-four hours later. The baby weighed 5 pounds 5 ounces (2,410 Gm.) and survived. The mother's condition improved rapidly. There were no subsequent attacks of pulmonary edema, and one week later her chest was clear. The vital capacity two weeks post partum had risen to 2,540 cc.

The patient has been followed for two years since delivery and has shown a progressive increase in blood pressure with albuminuria. Only within the past two months have attacks of paroxysmal dyspnea recurred, and subjectively they are of the same character as those which the patient experienced for the first time when pregnant.

Studies of the vital capacities and hemodynamics of these patients show changes similar to those reported in classic cardiac asthma. All showed a marked decrease in the vital capacity, which increased rapidly with clinical improvement following delivery. Changes in the cell volume as determined by hematocrit readings indicate marked hemoconcentration associated with the seizures. Peripheral venous pressure and circulation time⁴ were found to be within the upper limits of normal.

Although, as we have pointed out, cardiac asthma and acute pulmonary edema may complicate simple acute preclampsia in patients without a background of hypertensive or renal disease, this symptom complex is more commonly encountered when preclampsia is superimposed on such a background.

Our previous report dealt primarily with the complication in patients with simple preclampsia. In this study, on the other hand, some degree of vascular hypertension formed a background for the preclampsia in all cases.

We believe that general recognition of this complication of nonconvulsive toxemia is important for two

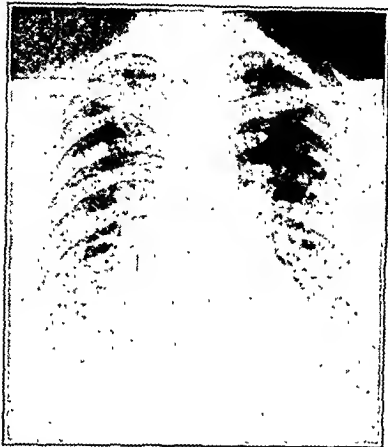


Fig. 1 (case 4).—Degree of pulmonary congestion and cardiac dilatation at the height of an attack of "cardiac asthma."

retinal vessels. The heart was enlarged and the lungs were full of rales. The vital capacity was 1,500 cc., and the hematocrit reading was 42.59.

Some twenty-four hours after admission (during which interval several attacks of paroxysmal dyspnea had been observed), labor was induced by artificial rupture of the membranes. Several hours later she delivered a living baby normally. Her condition was only fair for several days post partum. There was one rather mild attack of pulmonary edema on the tenth postpartum day. However, two weeks following delivery the vital capacity had risen to 2,280 cc. and the hematocrit reading had decreased to 33.50.³ She was discharged much improved with the blood pressure still 190/110.

She has been observed for two years following delivery. She has had no subsequent attacks of paroxysmal dyspnea and she is able to do light housework with no discomfort. The blood pressure at the last observation was 220/114. The urine is free from albumin. She has been sterilized by x-rays.

Although this patient was reasonably well treated by bed rest, restriction of fluid intake and digitalization, the attacks persisted and tended to become worse during the three weeks until the pregnancy was terminated. We have had similar experience with other patients observed and treated for shorter periods.

The final history to be reported here is that of a primipara about whose blood pressure we have no information prior to or early in pregnancy. From her physical examination at the time of the attack and her subsequent course we suspect that there was antecedent hypertension.

CASE 4.—D. W., a primigravida aged 33, entered the hospital for emergency treatment in the thirty-eighth week of pregnancy. Her complaints were dyspnea, orthopnea and swelling of the lower extremities. The past and family histories were non-contributory. It is known that at examination six years previously the urine contained no albumin, the sediment was negative and the specific gravity was 1.030.

3. The cell volume two weeks post partum (33.50 per cent) is considerably lower than that obtained during the seizures of dyspnea before delivery (42.59 per cent). Ordinarily the cell volume increases considerably following delivery. This marked reversal of the usual trend indicates that there was considerable hemoconcentration associated with the seizures of cardiac asthma.



Fig. 2 (case 4).—Appearance nine weeks after delivery.

4. Venous pressure was determined by the method of Moritz and von Tabora (Ueber eine Methode, beim Menschen den Druck in oberflächlichen Venen exakt zu bestimmen, Deutsches Arch. f. klin. Med. 98: 475, 1910) and the circulation time by the method of Robb and Weiss (A Method for the Measurement of the Velocity of the Pulmonary and Peripheral Venous Blood Flow in Man, Am. Heart J. 8: 650 [June] 1933).

reasons: First, its frequency is greater than is generally appreciated.⁵ It is one of the more common immediate causes of death from nonconvulsive toxemia. Its early recognition combined with suitable therapy will aid in reducing the mortality in nonconvulsive toxemia. Second, consideration of the probable similarity in the mechanisms of origin of cardiac asthma with acute pulmonary edema in the nonconvulsive toxemic patient and acute pulmonary edema in the eclamptic should lead to more rational and effective therapeutic protection of the heart in eclampsia.

We have found no cause to modify our original view that the immediate cause of the symptom complex is left ventricular heart failure. We would point out that, in general, marked degrees of acute pulmonary edema more often accompany the seizures in patients with preeclampsia than in nonpregnant hypertensive patients with cardiac asthma. In addition, in most instances signs of pulmonary edema persist between attacks until delivery is accomplished. The increased capillary permeability, edema and low serum proteins which are characteristic of preeclampsia would appear to offer a reasonable explanation for this difference.

Immediate treatment of the acute seizures involves the use of morphine in large doses, and venesection or peripheral venostasis if pulmonary edema is marked. After a brief period, temporary improvement is the rule. However, from knowledge of the clinical courses of some fifteen cases we have come to the conclusion that prolonged expectant therapy, even including suitable cardiac measures, is undesirable. Once the patient has had such attacks, the improvement has been temporary and recurrence of attacks is the rule until the patient is delivered. For this reason termination of the pregnancy by suitable means is desirable when the patient has been prepared by preliminary fluid restriction and full digitalization. This should be a matter of from twelve hours to, at the most, three or four days.

Again, it must be emphasized that the immediate prognosis must be guarded in undelivered patients in whom this symptom complex develops. Death may occur during the attack. However, it is equally important to realize that, once such patients are successfully delivered, the outlook is not a dismal one. The occurrence of such attacks in the presence of pregnancy cannot be regarded as evidence of the rapidly progressive vascular disease which it denotes in the nonpregnant, but rather of a temporary removable burden to the vascular system produced by the toxemia of pregnancy. In our experience these patients, with one exception, have continued to enjoy relatively normal lives without recurrence of the attacks described.

SUMMARY AND CONCLUSIONS

Nonconvulsive toxemia of pregnancy characterized by marked hypertension, albumin and edema is occasionally complicated by sudden left ventricular heart failure, as indicated by seizures of cardiac asthma with acute pulmonary edema. Both patients with previously normal vascular and renal systems and with antecedent hypertension may have such attacks, although they are more common in the latter. Once such attacks have occurred, lasting improvement is not to be expected until the pregnancy is terminated.

5. In a recent report of a fatal case of nonconvulsive pregnancy toxemia by Harrison and his associates, acute pulmonary edema would appear to have been the immediate cause of death (Harrison, D. A., Jr.; Shelton, J. H., and Carrithers, C. M.: Postmortem Cesarean Section in Twin Pregnancy, with Delivery of Two Living Babies, *J. A. M. A.* 110: 2066 [June 18] 1938).

Therapy consists in large doses of morphine with venesection, or in peripheral venostasis when indicated by severe pulmonary edema, followed by rapid digitalization and dehydration and delivery within a few days.

The immediate prognosis is grave, but if delivery is survived the ultimate prognosis is good.

We believe that the distressing pulmonary edema often encountered in severe and fatal eclampsia is also a result of acute left ventricular heart failure. For this reason, rapid full digitalization of all eclampsia patients is indicated.

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THE TREATMENT OF PULMONARY TUBERCULOSIS WITH SULFAPYRIDINE

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The encouraging results of sulfanilamide therapy in infections caused by the hemolytic streptococcus, the meningococcus, the colon bacillus and the gonococcus, and the more recent results of sulfapyridine therapy in pneumococcal pneumonia have made us hopeful that eventually some such chemotherapeutic agent might be discovered which would influence the course of pulmonary tuberculosis in a favorable manner. The reports from England as well as those from America have indicated that sulfapyridine is an impressive drug, powerful in effecting a cure in pneumonia yet relatively nontoxic as far as permanent harm or death of the patient is concerned. We felt that this drug might have some bactericidal effect on the tubercle bacillus, and since there had been no reports on its use in treating tuberculosis we decided in December 1938 on the investigation which we are now reporting. Recently there has appeared in the literature a paper on the effects of sulfapyridine on experimental tuberculosis in the guinea pig by Feldman and Hinshaw.¹ These observers report that in their investigation sulfapyridine exerted a definite and striking modification and retardation of the expected course of experimentally induced disease. The most impressive effects were those related to the spleen. The spleens of the untreated animals presented without exception severe progressive tuberculosis, while those in the treated animals, with one exception, showed no gross signs of tuberculosis.

For the study of the action of sulfapyridine on the clinical course of pulmonary tuberculosis in human beings we agreed that certain requirements must be met in the selection of our cases. In the first place we decided that only cases presenting exudative processes with little tissue defect (cavity formation) would be used, since, it was argued, if these cases did not respond to the drug certainly it could be assumed that long standing cases of fibrocavernous phthisis would not respond. Secondly, it seemed wise to use only patients whose sputums were positive for tubercle bacilli at the time so that there would be no doubt in our minds of the diagnosis. It was further decided that this would

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The sulfapyridine used in this work was supplied by Merck & Co., Inc. 1. Feldman, W. H., and Hinshaw, H. C.: Proc. Staff Meet., Mayo Clin. 14: 174 (March 15) 1938.

be a short period study to ascertain, if possible, the effects if any on the pulmonary process.

As the average adult pneumonia patient receives from 20 to 25 Gm. of sulfapyridine to effect a cure, it appeared reasonable to assume that in treating patients with pulmonary tuberculosis we should use from two to four times this amount over a longer period of time.

No attempt was made in our study to determine the blood level (estimates of sulfapyridine concentration in the blood).

REPORT OF CASES

CASE 1.—E. H., a man aged 49, a Russian, was admitted to Bellevue Hospital Dec. 30, 1938, with a history of cough of two months' duration productive of 150 cc. of thick gray, nonfoul sputum daily. At the onset of his illness there had been a hemoptysis of one half ounce (15 cc.) of blood, followed by streaking for several days. He had noticed some dyspnea and had had night sweats for several weeks. Hoarseness had been present for about the same period. He had had no chills and apparently no fever. His past history revealed that he had been a heavy drinker for the last five years. Fifteen years before he had had a primary syphilitic lesion for which he had received antisiphilitic therapy.

Examination of the chest revealed bilateral apical dullness, greater on the right, with bronchovesicular breath sounds over both apices. No rales were heard. The initial roentgenogram of the chest (Jan. 1, 1939) showed a mixed type process, but predominantly exudative, involving to some degree all the right lung but especially the upper half with a nodular distribution. No cavities were visible. The left lung showed a bronchiogenic spread to the first and second intercostal spaces.

The laboratory observations were as follows: The urine was normal. The Wassermann reaction of the blood was negative. Concentrated sputum was positive for tubercle bacilli.

A blood count Jan. 2, 1939, showed hemoglobin 87 per cent, red cells 4,910,000, white cells 7,150, polymorphonuclear leukocytes 74 per cent, lymphocytes 25 per cent and monocytes 1 per cent. On January 5 it showed white cells 11,200, polymorphonuclear leukocytes 72 per cent, lymphocytes 24 per cent and monocytes 4 per cent.

The patient was started on sulfapyridine 1 Gm. every four hours. He received a total of 57 Gm. in fourteen days.

After the second and third doses of the drug the patient complained of epigastric "burning" and nausea but there was no vomiting. This disappeared as soon as the drug was withdrawn and did not return when the drug was resumed two days later, although he did have slight dizziness. The temperature range was between 98 and 100.6 F. (rectally) during his stay in the hospital and did not appear to be affected by the drug. February 7 a second roentgenogram of the chest revealed no clearing of the tuberculous process. A third and final roentgenogram of the chest on February 27 revealed no essential change in the tuberculous process. Sputum examination continued to be positive for tubercle bacilli. The patient showed no improvement and was discharged to a sanatorium February 28, having been observed for two months.

CASE 2.—F. B., a man aged 27, a Filipino, was admitted to Bellevue Hospital Jan. 14, 1939, having been transferred from Mount Sinai Hospital. He gave a history of sudden onset of chills, fever, sweats and marked weakness two weeks before admission. There was slight cough with scanty white sputum. He had lost 15 pounds (6.8 Kg.) in the last few weeks. Recently he had noticed a tender swollen gland in the lower right anterior cervical region, which had been aspirated at Mount Sinai Hospital and culture of the pus reported positive for tubercle bacilli. The past history was irrelevant.

On examination the patient was thin and acutely ill, with rapid respirations, hot moist skin, a temperature of 105 F. (rectally) and pulse 130. The chest appeared normal except for harsh breath sounds throughout. No rales were heard. The spleen was palpable.

The initial roentgenogram of the chest January 14 revealed the finely nodular symmetrical infiltration evenly distributed from apexes to bases so characteristic of hematogenous miliary tuberculosis. The laboratory observations were as follows: The urine showed a trace of albumin. The Wassermann reac-

tion of the blood was negative. Concentrated sputum was negative for tubercle bacilli.

A blood count January 17 showed hemoglobin 65 per cent, red cells 2,970,000, white cells 11,300, polymorphonuclear leukocytes 80 per cent, lymphocytes 11 per cent and monocytes 9 per cent. On January 18 it showed white cells 10,800, polymorphonuclear leukocytes 70 per cent, lymphocytes 26 per cent, monocytes 3 per cent and eosinophils 1 per cent. On January 23 it showed white cells 11,200, polymorphonuclear leukocytes 68 per cent and lymphocytes 32 per cent.

The patient was given sulfapyridine 1 Gm. every four hours. He received a total of 18 Gm. in five days.

Twelve hours after sulfapyridine was started, the temperature dropped two degrees and the pulse was slightly lower. On the second day after sulfapyridine administration the patient complained of abdominal cramps and nausea. Shortly after this vomiting set in, and after the patient had received only 18 Gm. of the drug it was necessary to discontinue it. From then on the course of the disease was rapidly progressive to a fatal termination. Death occurred January 28, on the fourteenth day of his stay in the hospital. A roentgenogram of the chest taken the day before his death (January 27) revealed the process in the lungs to be more extensive, especially at the bases.

On postmortem examination hematogenous miliary tuberculosis was revealed in the lungs, the heart, the serous membranes, the spleen, the liver, the adrenals and the kidneys.

CASE 3.—S. M., a man aged 38, an Italian, was admitted to Bellevue Hospital Dec. 29, 1938, with the history of a rather sudden onset of chest cold three weeks before admission. He expectorated 1 ounce (30 cc.) of mucopurulent sputum daily and complained of right anterior chest pain of two weeks' duration and left anterior chest pain of three weeks' duration. There had been weakness and fatigue for two weeks, some anorexia and the loss of 5 pounds (2.3 Kg.) in weight. The past history was irrelevant.

Examination of the chest revealed dullness on the left from the apex to the fourth rib anteriorly and the fourth thoracic spine posteriorly, with a patch of medium moist rales and increased breath sounds in the posterior axillary line at the level of the seventh thoracic vertebra. The right side of the chest showed dullness to the fourth rib anteriorly and the fourth thoracic spine posteriorly with amphoric breathing at the apex. There was bronchovesicular breathing on the right from the infraclavicular region to the fifth rib and posteriorly to the sixth thoracic spine with medium moist rales over this area. The rales at the right apex had a consonating quality.

The initial roentgenogram of the chest December 30 showed a diffuse exudative infiltration involving the right upper lobe with multiple cavitations in the apical and subapical regions. The lower half of the right lung showed a diffuse, nondense, finely nodular infiltration. The left lung showed an exudative nodular infiltration below the first rib, particularly in the periphery of the second and third intercostal spaces.

The laboratory observations were as follows: The urine was normal except for a very faint trace of albumin. The Wassermann reaction of the blood was negative. Concentrated sputum was positive for tubercle bacilli. A blood count Jan. 2, 1939, showed white cells 8,800, polymorphonuclear leukocytes 76 per cent and lymphocytes 24 per cent.

The patient was given sulfapyridine 1 Gm. every four hours, but after receiving only 9 Gm. of the drug in three days he became so nauseated that he insisted on leaving the hospital.

CASE 4.—W. M., a man aged 44, Polish, admitted to Bellevue Hospital Jan. 9, 1939, had for seven months had a troublesome cough which had become productive of 1 ounce (30 cc.) of mucopurulent sputum daily in the last three weeks. There had been no hemoptysis. Hoarseness had been present for five weeks with slight pain on swallowing. The past history was irrelevant.

Examination of the chest revealed dullness in the infraclavicular areas, especially on the right side, with some degree of dullness over most of the right side of the chest. There were bronchovesicular breath sounds over most of the chest, front and back, with rales of all types. Consonating rales were heard in the right infraclavicular area.

The initial roentgenogram of the chest January 11 revealed extensive bilateral tuberculosis, chiefly exudative, with a pneumonic process involving the right upper lobe and a 5 by 6 cm. cavity at the right apex. There was a typical bronchiogenic miliary spread to the bases.

The laboratory observations were as follows: The urine was normal. The Wassermann reaction of the blood was negative. Concentrated sputum was positive for tubercle bacilli.

A blood count January 13 showed hemoglobin 85 per cent, red cells 4,980,000 and white cells 12,150.

January 14 it showed red cells 4,730,000, white cells 14,850, polymorphonuclear leukocytes 91 per cent and lymphocytes 9 per cent.

January 15, red cells 4,940,000, white cells 11,250, polymorphonuclear leukocytes 88 per cent and lymphocytes 12 per cent.

January 16, white cells 10,550, polymorphonuclear leukocytes 85 per cent and lymphocytes 15 per cent.

January 17, white cells 9,050, polymorphonuclear leukocytes 86 per cent and lymphocytes 22 per cent.

January 18, white cells 10,200, polymorphonuclear leukocytes 78 per cent and lymphocytes 22 per cent.

January 19, white cells 7,800, polymorphonuclear leukocytes 65 per cent and lymphocytes 35 per cent.

January 21, red cells 4,500,000 and white cells 10,000.

January 28, white cells 11,200, polymorphonuclear leukocytes 81 per cent and lymphocytes 19 per cent.

The patient was given sulfapyridine 1 Gm. every four hours and received a total of 108 Gm. in twenty-five days. After the first slight epigastric "burning," which was relieved by sodium bicarbonate, he had no ill effects from the drug in any way that we were able to determine. After receiving 6 Gm. of the drug his temperature fell from 103.6 to 101.6 F. and after 12 Gm. of the drug became normal. In spite of the continuance of the drug, however, the temperature from then on fluctuated between 101 and 101.6 F. A second roentgenogram of the chest January 26 showed that there was some spread of the tuberculous process at the bases; otherwise there was no change from the film taken January 11. Subsequent sputum tests were positive for tubercle bacilli. After a total of 108 Gm. of sulfapyridine had been given it was apparent from signs, symptoms, x-ray examinations and the sputum that the patient had not been benefited by the drug. He now appeared weaker and was transferred February 15 to Seton Hospital, where he died of tuberculosis March 13.

CASE 5.—C. V., a Puerto Rican woman aged 24, was admitted to Bellevue Hospital March 27, 1939, with the history of a productive cough of two weeks' duration. The sputum was not foul. There had been no hemoptysis. She had lately noticed sweats at night and thought that she had been feverish. The past history was irrelevant.

Examination of the chest revealed dullness and loud bronchial breathing over the upper half of the right lung with medium moist and a few crepitant rales over this area. Aside from some harsh breath sounds at the apex the left lung appeared clear.

The initial roentgenogram of the chest, March 28, revealed a dense pneumonic process from the right apex to the fourth rib, the base of the shadow being outlined by the interlobar fissure. There was slight rarefaction in the first intercostal space. The left lung showed an exudative infiltration in the second and third intercostal spaces.

The laboratory observations were as follows: The urine was normal. The Wassermann reaction of the blood was negative. Initial sputum was negative for tubercle bacilli but two concentrated specimens of sputum taken soon after this were positive, as were all subsequent specimens.

A blood count March 31 showed hemoglobin 60 per cent, white cells 12,160, polymorphonuclear leukocytes 89 per cent and lymphocytes 11 per cent.

On May 3 it showed hemoglobin 79 per cent, red cells 4,840,000, white cells 5,880, polymorphonuclear leukocytes 79 per cent and lymphocytes 21 per cent.

On June 2 it showed hemoglobin 64 per cent, red cells 4,130,000, white cells 10,800, polymorphonuclear leukocytes 82 per cent and lymphocytes 18 per cent.

The patient was given sulfapyridine 1 Gm. every four hours with no apparent effect on her temperature, which ranged between 101 and 103 F. After five days of sulfapyridine therapy the patient, having received a total of 19 Gm., complained of pain and tenderness over the region of the left kidney and she began to have hematuria. Sulfapyridine was stopped and soon the hematuria did likewise. She continued to have pain in the left costovertebral angle, and an intravenous pyelogram was made which showed incomplete filling of the pelvis of the left kidney. Cystoscopy was carried out, revealing an obstruction of the left ureter near the kidney pelvis. With considerable difficulty a number 5 catheter was finally passed to the kidney pelvis, resulting in a rapid flow of clear amber urine. Following this procedure the pain and tenderness in the left kidney region cleared up almost immediately and she had no more trouble in this respect. A second intravenous pyelogram after this cystoscopic treatment showed a normal functioning left kidney. It was thought that the ureteral obstruction was due to acetylsulfapyridine crystals settling out in the kidney pelvis and passing into the ureter, forming an impaction.

A second roentgenogram of the chest April 17 revealed a spread of the tuberculous process in the left second intercostal space and likewise to the right base. A roentgenogram of the chest May 15 showed that the process in the left lung had spread considerably since her previous examination. A roentgenogram of the chest May 26 showed that both entire lung fields were almost completely involved with the tuberculous process. The patient is still in the hospital as this paper is being written, and apparently within a few weeks this case will terminate fatally.

CASE 6.—C. S., a white woman aged 20, was admitted to Bellevue Hospital March 24, 1939, with a history of pleurisy on the left side one year before, following which she was apparently well until September 1938, when she began to cough and expectorated half a cupful of nonfoul sputum daily. She had noticed some loss of weight, some weakness and dyspnea in the last two months. The past history, prior to her pleurisy one year before, had been essentially irrelevant.

On examination the patient appeared thin and chronically ill. She had "shotty" cervical glands. The trachea appeared to deviate slightly to the right. There was right apical dullness, and medium moist rales could be heard from the right apex to the fourth thoracic spine posteriorly. The left side of the chest showed dullness from the apex to the fourth rib anteriorly and to the fourth thoracic vertebra posteriorly. Over this area there were bronchovesicular breathing and medium moist and a few coarse rales.

The initial roentgenogram of the chest, March 25, revealed a mixed type process, predominantly exudative however, in the right first intercostal space and below the fifth rib. The left lung showed an exudative infiltration and small cavitation in the second intercostal space and some involvement of the left base.

The laboratory observations were as follows: The urine was normal. The Wassermann reaction of the blood was negative. Concentrated sputum was positive for tubercle bacilli.

A blood count April 6 showed hemoglobin 85 per cent, red cells 4,950,000, white cells 7,400, polymorphonuclear leukocytes 70 per cent, lymphocytes 24 per cent, monocytes 4 per cent and basophils 2 per cent.

April 16, red cells 5,400,000, white cells 8,450, polymorphonuclear leukocytes 74 per cent, lymphocytes 11 per cent, monocytes 7 per cent, transitionals 7 per cent and basophils 1 per cent.

April 22, red cells 5,090,000, white cells 9,500, polymorphonuclear leukocytes 85 per cent, lymphocytes 12 per cent, monocytes 3 per cent and basophils 1 per cent.

April 27, white cells 8,600, polymorphonuclear leukocytes 72 per cent and lymphocytes 9 per cent.

The patient was given sulfapyridine 1 Gm. every four hours; she received 103 Gm. in twenty-three days.

After receiving sulfapyridine for two days she became nauseated and vomited and the drug was withdrawn for twenty-four hours. It was resumed without a return of her vomiting and with only slight nausea at times.

A roentgenogram of the chest taken April 7 showed no essential change from the film of March 25. One taken April 15 showed no essential change from the previous plates, but that taken April 28 showed considerable spread of the process in the left lower lobe. The sputum was still positive and the patient appeared to be going downhill rather rapidly. It was felt that in order to save the patient's life, if indeed this was possible, it was expedient to stop sulfapyridine, which had apparently done her no good after 103 Gm., and collapse the left lung at once. Accordingly this was done.

A roentgenogram May 13 showed approximately 20 per cent collapse of the left lung; the right lung showing no change. A roentgenogram of the chest May 31 showed 60 per cent collapse of the left lung with closure of the cavity in the second intercostal space. For the first time the contralateral lung showed some clearing. Although the sputum was still positive, the patient appeared better.

CASE 7.—F. S., an Irishman aged 33, was admitted to Bellevue Hospital March 22, 1939. He had been discharged from the Raybrook Sanatorium for Tuberculosis six years previously as having arrested pulmonary tuberculosis. Six months before admission to Bellevue a cough had developed productive of a copious of mucoid sputum daily. During the last few months he had lost 18 pounds (8 Kg.) and had night sweats. He entered the hospital because of recent onset of pain in the left anterior part of the chest, intensified by coughing and deep inspiration. His temperature on admission was 102. F.

Examination of the chest showed a respiratory lag on the left. There was tubular breathing with increased whispered and spoken voice from the second to the fourth rib on the left between the anterior and midaxillary lines. Over this area there were dullness and many fine rales. The right side of the chest showed a few scattered fine rales throughout.

An initial roentgenogram of the chest March 23 revealed a fine infiltration throughout the right lung with thickening of the pleura. The left lung showed some light infiltration at the apex and dense pneumonic infiltration from the second to the fifth rib.

The laboratory observations were as follows: The urine was normal. The Wassermann reaction of the blood was negative. Initial sputum was positive for tubercle bacilli. Sputum culture showed type V pneumococcus.

A blood count March 23 showed hemoglobin 100 per cent, red cells 3,290,000, white cells 15,920, polymorphonuclear leukocytes 86 per cent and lymphocytes 14 per cent. March 29 it showed white cells 8,090, polymorphonuclear leukocytes 77 per cent, lymphocytes 19 per cent and monocytes 4 per cent.

The patient was given sulfapyridine 1 Gm. every four hours. The temperature, which on admission had been 102 F., fell to 99 within forty-eight hours of starting sulfapyridine therapy. The patient became so nauseated and vomited so much that after taking 5 Gm. of the drug it was discontinued. A roentgenogram of the chest April 1 revealed some slight clearing of the pneumonic area in the left lung. The process in the right lung remained the same. Roentgenograms of the chest taken April 11, April 19 and May 4 showed progressive clearing of the pneumonic process in the left lung, with no change in the tuberculous process on the right.

It was believed that we were dealing with a case of pulmonary tuberculosis in which type V pneumococcus pneumonia of the left upper lobe had developed. This pneumonia cleared under sulfapyridine therapy but the tuberculosis was not affected. In this case even as little as 5 Gm. of the drug appeared to have cleared the pneumococcal infection.

SUMMARY AND COMMENT

Seven patients who had been diagnosed as having pulmonary tuberculosis were treated with sulfapyridine. Patient 2 had acute generalized miliary tuberculosis, which was proved at autopsy, and was the only patient who had a negative sputum. He was in a moribund condition when he arrived at the hospital. We do not feel that sulfapyridine affected his disease in any way nor do we believe that it contributed to his death. Patient 4 received the largest total amount of the drug, 108 Gm., and patient 7 received the smallest, 5 Gm.

Hematuria and pain and tenderness developed in case 5 in the region of the left kidney after 19 Gm. of the drug had been given. An intravenous pyelogram followed by cystoscopic examination revealed an obstruction in the upper portion of the left ureter near the kidney pelvis. With considerable difficulty a catheter was passed to the left kidney pelvis and the obstruction was relieved. It was thought that this obstruction was due to the formation of ureteral stone or impaction from the settling out in the kidney pelvis of acetylsulfapyridine crystals.

Nausea and vomiting were the two most common toxic manifestations in our series, the former occurring in five of the seven cases, the latter in three. In three cases it was necessary to withdraw the drug permanently because of these symptoms. In one case it was necessary to withdraw the drug because of hematuria and ureteral obstruction. Two patients in this series have died of their disease. Patient 6, after 103 Gm., was showing such rapid spread of her pulmonary tuberculosis that her left lung was collapsed, following which she improved somewhat.

CONCLUSIONS

Seven patients with active pulmonary tuberculosis, one with acute generalized miliary tuberculosis, were treated with sulfapyridine. The object of our study was to ascertain the immediate effects of the drug on the tuberculosis over a relatively short period of time. Under the conditions described, no evidence was obtained to indicate that sulfapyridine influenced the course of the tuberculosis in these cases.

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THECA CELL TUMORS OF THE OVARY

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NEW ORLEANS

Solid ovarian tumors, especially those producing endocrine changes, have been the subject of much discussion and investigation both by the pathologist and by the gynecologist during the past few years. Robert Meyer's¹ work, reported in 1931, was probably the spark that first aroused interest in America. In this publication he described the dysgerminoma ovarii, the granulosa cell tumor and the arrhenoblastoma. Later numerous reports of these tumor types appeared in the literature at frequent intervals, as did also reports of Brenner cell tumors; Bland and Goldstein² reviewed the literature and collected sixty cases of the latter type of tumor in 1935. Loeffler and Priesel³ in 1932 recorded six cases of ovarian tumors, which they termed "fibroma theca cellulari xanthomatodes ovarii," and in 1934 the same authors⁴ reported four additional cases of this type. In the same year Melnick and Kanter⁵ reported two similar cases, the first to appear in the American literature, for which they adopted the

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1. Meyer, Robert: *Am. J. Obst. & Gynec.* 22: 697 (Nov.) 1931.
2. Bland, F. B., and Goldstein, Leopold: *Surg., Gynec. & Obst.* 61: 250-266 (Aug.) 1935.
3. Loeffler, E., and Priesel, A.: *Beitr. z. path. Anat. u. z. allg. Path.* 90: 199, 1932.
4. Loeffler, E., and Priesel, A.: *Wien. med. Wchnschr.* 84: 409 (April 7) 1934.
5. Melnick, P. J., and Kanter, A. E.: *Am. J. Obst. & Gynec.* 27: 41 (Jan.) 1934.

term "theca cell tumors of the ovary." Geist,⁶ in a series of papers, reported a large number of tumors which clinically simulated granulosa cell tumors of the ovary and pathologically resembled fibromas of the same organ. He proved by an extensive study of his cases, which embraced clinical, microscopic, chemical and biologic methods, that although theca cell tumors simulate granulosa cell tumors clinically and fibromas of the ovary microscopically they are a definitely clinical entity.

To date only twenty-four cases of theca cell tumors have been reported in the literature, and to this number we add two cases which have come under our observation during the past year.

HISTOGENESIS

The histogenesis of solid ovarian tumors has not been definitely established. One school, the disciples of Pflüger's theory, maintains that the granulosa cells and the theca interna cells of the ovary are derived from the gonadal epithelial covering. Fischel believes that the epithelial cells are derived from the mesenchyme of the ovary and that the germinal epithelium acts only as a nonfunctioning layer surrounding the ovary and contributes in no way to its structure. According to Robert Meyer,¹ granulosa cell tumors arise from mesenchymal embryologic rests ("granulosaballen"), in the hilus of the ovary, a view which is also supported by Walter Schiller.⁷ Recently Voigt⁸ reported a case of primary granulosa cell tumor of the retroperitoneum, and the fact that this primary tumor developed in a site far removed from functionless ovaries certainly lends strength to Fischel's theory. Geist⁹ is of the opinion that granulosa cell tumors and theca cell tumors arise from differentiated mesenchymal cells which are potentially capable of becoming either granulosa or theca cell in type. Novak¹⁰ is of the same opinion and for this reason opposes segregation of theca cell and granulosa cell tumors. Greenhill and Greenblatt¹¹ recently reported a case of combined theca and granulosa cell tumors and concluded that this case gives much weight to the theory that theca cell tumors and granulosa cell tumors originate in a common type cell of the ovarian mesenchyme, the "progranulosa cell."

Recent experimental production, by means of x-rays, of theca and granulosa cell tumors in the ovaries of mice, some of which showed definite lutein change, have

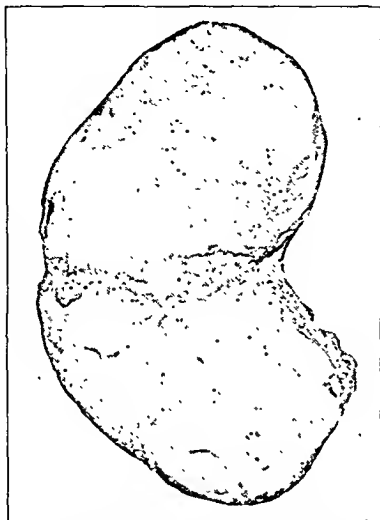


Fig. 1 (case 1).—Cut surface of theca cell tumor showing islands of yellow tissue separated by bands of fibrous tissue.

been carried on by Furth and Butterworth¹² and by Traut and Butterworth.¹³ Through these experiments, evidence is produced that, in experimental animals at least, granulosa cell tumors might arise from surviving adult granulosa cells. Certainly, although the exact manner of origin of theca cell tumors and of the closely related granulosa cell tumors is still a matter of conjecture, the preponderance of evidence is in favor of Fischel's theory of mesenchymal origin of the theca and granulosa cells.

PATHOLOGY

Theca cell tumors vary in size from a few centimeters in diameter to the size of a large grapefruit. On vaginal examination the consistency is that of a fibroma of the ovary or of a fibromyoma of the uterus. The same consistency is noted when the tumor is examined following removal. Externally the growth is slightly irregular in outline and varies in color from yellowish brown to yellowish red. On cut section the tumor is encapsulated and composed of many islands of yellow tissue separated by bands of connective tissue; occasionally small cystic areas may be noted throughout the tumor. Microscopically, theca cell tumors are made up of interlacing bands of spindle or epithelioid cells irregularly distributed and separated by strands of connective tissue containing hyaline plaques. The nuclei are oval and rod shaped with an occasional mitotic figure present. Fat stains show the presence of intracellular and extracellular lipid material, which, according to Geist, is doubly refractile and probably consists of cholesterol or cholesterol esters.

CLINICAL FEATURES

Theca cell tumors of the ovary are usually unilateral and are of the consistency of a fibroma of the ovary or fibromyoma of the uterus. They occur at any age, the oldest reported case being that of a woman aged 90 and the youngest that of a woman aged 18. All but three of the reported cases occurred at or past the

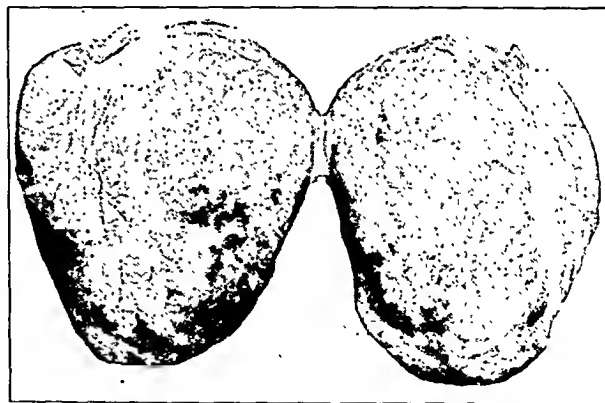


Fig. 2 (case 2).—External surface of theca cell tumor showing irregular outline and dilated blood vessels, ranging in color from lemon yellow to orange.

menopause. That theca cell tumors are biologically active is evidenced by the atypical bleeding found in the menopausal and postmenopausal cases and by the occurrence of endometrial hyperplasia in a large number of these cases. In younger women, periods of amenorrhea, preceded or followed by menorrhagia, is the usual his-

6. Geist, S. H., and Spielman, Frank: An Unusual Ovarian Tumor Containing An Estrogenic Hormone, *J. A. M. A.* 104: 2173 (June 15) 1935.
7. Geist, S. H.: *Am. J. Obst. & Gynec.* 30: 480 (Oct.), 650 (Nov.) 1935.
8. Geist, S. H., and Gains, J. A., *ibid.* 35: 39 (Jan.) 1938.

9. Schiller, Walter: *J. Obst. & Gynec. Brit. Emp.* 43: 1135 (Dec.) 1936.

10. Voigt, W. W.: *Am. J. Obst. & Gynec.* 36: 688 (Oct.) 1938.

11. Geist, S. H., in discussion on paper by Traut and Butterworth.¹³
12. Novak, Emil, and Gray, L. A.: *Am. J. Obst. & Gynec.* 31: 213 (Feb.) 1936.

13. Greenhill, J. P., and Greenblatt, R. B.: *Am. J. Obst. & Gynec.* 36: 684 (Oct.) 1938.

12. Furth, J., and Butterworth, J. S.: *Am. J. Cancer* 28: 66 (Sept.) 1936.

13. Traut, H. F., and Butterworth, J. S.: *Am. J. Obst. & Gynec.* 34: 987 (Dec.) 1937.

tory. Although only one case has been examined by hormone assay, the finding of a large amount of the estrogenic substance in this case and the frequency with which hyperplasia of the endometrium has been encountered in other cases of this type present sufficient evidence to indicate that usually the estrogenic substance is found in these cases in larger quantities than in normal ones.

REPORT OF CASES

CASE 1.—History.—A. M. C., a woman aged 24, admitted to Charity Hospital Nov. 27, 1937, complained chiefly of pain in the right side and amenorrhea. She stated that she had not menstruated since Jan. 13, 1937.

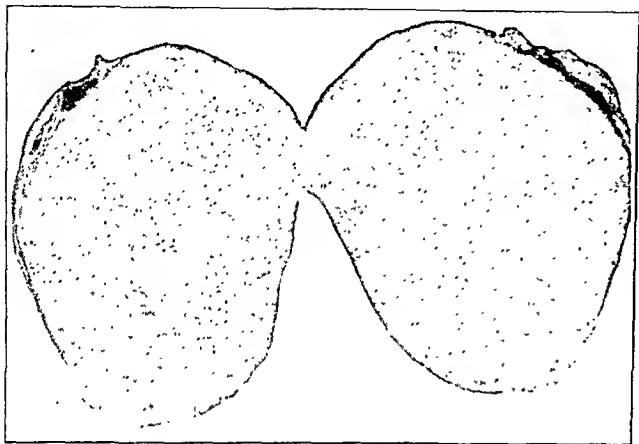


Fig. 3 (case 2).—Cut surface of tumor shown in figure 2. Note islands of tumor tissue separated by bands of connective tissue.

Prior to that time her menstrual periods had occurred approximately every twenty-eight days and had lasted for a period of three days. The menstrual cycle began when the patient was 10 years old. She had been married for ten years and had been pregnant once, resulting in a normal delivery nine years before. Her last menstrual period began Dec. 15, 1936, and continued until Jan. 13, 1937. For four months prior to admission she experienced pain in the right side and right lumbar region. There had been a slight leukorrheal discharge, and the patient had noticed a mass in the right side for three weeks. Other features of the history were irrelevant.

Examination.—On physical examination the blood pressure was 140 systolic, 80 diastolic. The breasts were flabby and a mass was felt in the right side of the abdomen. Otherwise, the general physical examination was negative.

On vaginal examination, the external genitalia and Skene's and Bartholin's glands were normal. A mild cystocele and rectocele were present. The cervix was slightly enlarged and soft with a moderate degree of infection. The size, shape, position and mobility of the uterus were normal. There was a mass in the right adnexa the size of a golf ball, not attached to the uterus, and of firm consistency.

Laboratory examination of the urine was negative. The Wassermann reaction was negative. The blood pressure was within normal limits. X-ray examination of the chest and of the sella turcica showed no evidence of pathologic changes. X-ray films of the kidney, ureter and bladder were negative. The blood count was well within normal limits. The basal metabolic rate was minus 5.

The preoperative diagnosis was chronic cervicitis and luteinized granulosa cell tumor of the ovary.

Operation.—This consisted of dilation and curettage and of laparotomy. On examination of the pelvis, the uterus was found to be normal in size, shape and mobility. The left adnexa were normal. On the right side a large, firm, yellow ovarian tumor approximately 5 cm. in diameter was found. It was freely movable and involved the whole of the ovary. Ascites was not present. A right oophorectomy was performed and the abdomen was closed in anatomic layers. The patient had a normal postoperative course and was discharged on the tenth postoperative day.

Pathologic Reports.—Gross: The tumor measured 5 cm. by 5 cm. and was yellowish red and firm. Cut section revealed the tumor to be made up of numerous islands of yellow tissue, separated by bands of connective tissue. On exposure to air the yellowish color deepened.

Microscopic: Uterine scrapings were examined microscopically. Section of the endometrium showed inactivity and hypoplasia of glandular elements. Slight secondary infection was noted. Section of the ovary showed the tumor to be made up of numerous bands of interlacing fibrous connective tissue separating masses of irregularly arranged spindle shaped cells. Fat stains showed the presence of lipoids in large amounts both intracellularly and extracellularly.

Follow-Up.—The patient menstruated five weeks after operation and has menstruated regularly ever since, menstrual periods occurring approximately every twenty-eight days and lasting from three to four days.

CASE 2.—History.—Mrs. L. B. aged 22, admitted to Touro Infirmary April 19, 1938, complained chiefly of amenorrhea. The patient missed her October 1937 period but menstruated at the end of November. She did not menstruate in December 1937 or January 1938 but did in February and March. All periods were normal when present. Menstrual periods began at the age of 12 years and occurred at from twenty-eight to thirty day intervals, lasting from four to five days. Severe dysmenorrhea was present on the first day of each period, but the flow was normal in amount and character. She had never missed a period before October 1937. She was married in July 1937 and had used contraceptives ever since and had never become pregnant. Prior to admission she had not menstruated for seven weeks. There were several attacks of pain in the

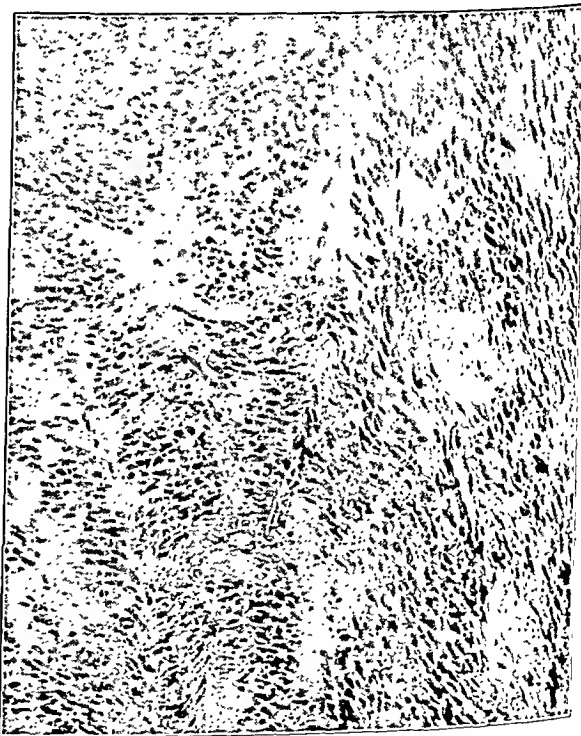


Fig. 4 (case 1).—Theca cell tumor under low power showing spindle shaped cells separated by bands of connective tissue and containing hyaline plaques.

lower right quadrant for two months, the pain radiating down into the pelvis. Otherwise the patient's history was irrelevant.

Examination.—The blood pressure was 120 systolic and 70 diastolic. The breasts were small, and aside from a suggestion of masculine distribution of the pubic hair there were no abnormalities noted.

Vaginal examination revealed a nulliparous outlet, intact perineum, no cystocele or urethrocele and no infection of Bartholin's or Skene's glands. The cervix was small. The uterus

was normal in size, shape and mobility. The left ovary was palpable but of normal size. The right ovary was enlarged to the size of a small grapefruit and very hard and firm.

The Wassermann reaction was negative. The urine was normal and a blood count was within normal limits.

The preoperative diagnosis was theca cell tumor of the right ovary.

An operation was performed April 21 with a subumbilical mid-line incision. Exploration of the pelvic cavity showed that the uterus was normal in size, shape, position and mobility. The right tube was normal but the right ovary was large, the size of a small grapefruit and freely movable. The tumor occupied the entire ovary, was freely movable, slightly irregular in outline and of yellowish red. The tumor was firm and there was

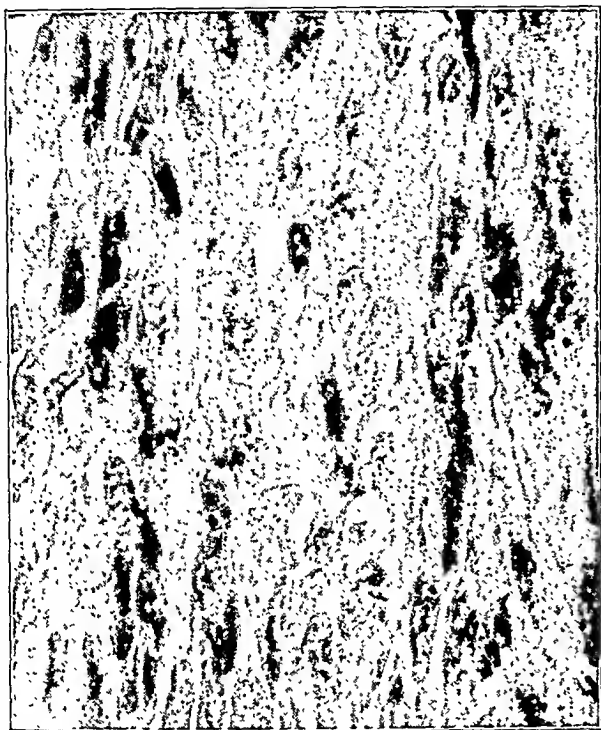


Fig. 5 (case 2).—Theca cell tumor under high power showing epithelioid cells.

no evidence of ascites. A right oophorectomy and appendectomy were performed. The abdomen was closed in anatomic layers.

Pathologic Report.—Gross: The tumor measured 10 by 12 cm. in diameter and occupied the entire ovary; it was slightly irregular in outline and of very firm consistency. The external coloring varied from yellowish red to yellowish brown. A few dilated blood vessels coursed over the surface of the ovary. On cut section the tumor was found to be solid and made up entirely of areas of yellow tissue separated by thin septums of connective tissue.

Microscopic: Section of the ovary showed that it was made up of bundles of elongated cells with nuclei that were oval and rod shaped, separated by small amounts of intracellular substance. An occasional mitotic figure was noted, although the cells were for the most part well differentiated. Histologically it was a supportive cell neoplasm. No epithelial elements were demonstrated. A fibroma was present.

A corrected pathologic report demonstrated a theca cell tumor of the ovary and chronic appendicitis. Fat cells showed presence of intracellular and extracellular lipoid material in large amounts.

Follow-Up.—The patient menstruated four weeks after operation and has menstruated at regular intervals ever since.

COMMENT

As a general rule, theca cell tumors occur at or past the menopause. Of the twenty-four cases reports of which have appeared in the literature, only three have

occurred in younger women (Loeffler and Priesel, one case; Geist, two cases). Both of our cases occurred in young women, and, in contrast to the menorrhagia at the menopausal age, both of our patients had a period of amenorrhea of varied duration. This is true also of the cases of theca cell tumors that appeared in younger women which were reported by Loeffler and Priesel and by Geist. The history of periods of menorrhagia followed by or preceded by periods of amenorrhea and accompanied by the clinical finding of a unilateral solid ovarian tumor should arouse suspicion as to the existence of a theca cell tumor, even in a young female. In the second case, although the first pathologic report was that of fibroma, we were so confident that such was not the case that we persuaded the pathologist to restudy the slides and make special fat stains of the tumor. This led to a corrected diagnosis of theca cell tumor. Undoubtedly a number of cases of theca cell tumors have been reported in the past as fibromas of the ovary. Correlation of the clinical history of abnormal bleeding and the luteinized appearance of the tumor should suggest the possibility of theca cell tumor, and extensive microscopic study should be made by the pathologist to determine its presence. Otherwise we are certain that the majority of these cases will be reported as fibromas. Unfortunately we failed to obtain any endometrium from our second case. The first case, however, showed an inactive endometrium with hypoplasia of the glandular elements. This finding we are unable to explain. The majority of theca cell tumors reported have shown definite hyperplasia.

In both cases unilateral oophorectomy was performed. The uterus, both tubes and the remaining ovary were allowed to remain in situ, as the tumors were grossly benign and only two of the reported cases have been malignant. Since removal of the tumors, normal menstrual cycles have been reestablished in both cases.

CONCLUSIONS

1. Theca cell tumors are a definite clinical entity and, though occurring most frequently at the menopause, may occur at any age.

2. From the reported cases and our two cases of theca cell tumors occurring in young women, it would seem that theca cell tumors may produce menorrhagia in younger women but that amenorrhea of varying periods is the rule. In women near the menopause, menorrhagia is the rule.

3. Unless fat stains and special studies are made of solid ovarian tumors, especially when associated with amenorrhea or menorrhagia, a number of theca cell tumors will continue to be erroneously diagnosed as fibromas.

1430 Tulane Avenue.

First Recorded Pandemic Plague.—The first recorded pandemic of plague according to Wu was that of Justinian in the sixth century, starting in Egypt in 542 A. D. and spreading to Constantinople. It lasted fifty to sixty years, and its victims are estimated at 100,000,000. The second plague pandemic, the "Black Death," took place in the fourteenth century in Europe and claimed 25,000,000 victims or about one fourth of the population. In Great Britain from half to two thirds of the people perished. The great plague epidemic of London, 1664-1666, is said to have killed 70,000 persons out of a total population of 450,000. Plague disappeared from England in about 1680, having been almost continuously present for nearly 140 years, with five epidemics.—Hermes, William B.: Medical Entomology, New York, Macmillan Company, 1939.

Clinical Notes, Suggestions and New Instruments

SULFANILAMIDE IN STAPHYLOCOCCIC SEPTICEMIA TWO CASES WITH RECOVERY

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AND CLIFTON REEL, M.D., CHARLESTON, W. VA.

Staphylococcic septicemia has long been considered as almost invariably fatal, and the finding of staphylococci in the blood stream of a patient with septicemia has led to the rendition of many a hopeless prognosis.

The recent introduction of sulfanilamide, and its use in infections of all types, has been of interest to all medical practitioners.

We have found one report of staphylococcic septicemia successfully treated with sulfanilamide. Morris¹ reports the use of antitoxin, transfusions and sulfanilamide for treating a white man aged 37 whose blood cultures showed *Staphylococcus albus* on four occasions.

REPORT OF CASES

CASE 1.—A white man, aged 31, was admitted to the Charleston General Hospital, Aug. 17, 1938, with the history of having jabbed the end of a pick into his knee nine days before admission while working as a coal miner. The patient noticed that shortly afterward the knee became painful and swollen. His doctor gave him tablets of mercury bichloride to dissolve in water for bathing the knee. In spite of this treatment the knee became worse.

Examination on admission revealed that the knee was swollen and tender. There was a small, unhealed puncture wound, which showed some infection, over the patella. The thigh was also swollen and tender. X-ray examination of the knee was negative. The patient's temperature on admission was 98 F. This rose to 102 F. at 4 p. m. and to 103.8 F. at 8 p. m. Urinalysis August 17 showed albumin (1 plus), no sugar, casts (1 plus), an occasional red blood cell, pus (1 plus) and mucus (1 plus). Treatment by means of continuous warm moist dressings to the knee and thigh was started.

August 18 his temperature was 104.4 at 8 p. m. Sulfanilamide 20 grains (1.3 Gm.) every three hours was started. This was accompanied by sodium bicarbonate 15 grains (1 Gm.) twice a day.

August 19 the swelling of the knee had receded. The patient was coughing and complaining of inability to breathe. A roentgenogram of the chest was negative. His temperature on this day was 102.5 F. at midnight.

August 20 a blood culture was reported as showing 5 colonies per cubic centimeter of an organism, probably *Staphylococcus aureus*. The hemoglobin, which had been 70 per cent August 19, had dropped to 59 per cent. Widal and undulant fever tests were reported negative, as was the blood Kline test. The sulfanilamide concentration in the blood on this date was 1.5 mg. per hundred cubic centimeters.

The patient was very ill at this time, being delirious and noncooperative. His condition seemed precarious. A transfusion of 500 cc. of blood was given August 20. On this day his temperature rose to 105.4 F. The pulse during this time was running between 120 and 140. The abdomen was somewhat distended and the patient perspired freely.

August 21 the temperature dropped to 100.4 F. at 8 a. m. However, it rose again to 103.4 F. at 8 p. m. On this day the hemoglobin was 70 per cent, erythrocytes 4,600,000 and leukocytes 16,000. The sulfanilamide concentration in the blood had risen to 3.5 mg.

August 22 cellulitis on the lateral side of the thigh was definitely present. The temperature ranged from 101.4 F. at 4 a. m. to 104.4 at 8 p. m. The patient did not respond to questions. Roentgen therapy was given, also a transfusion of 250 cc. of blood.

August 23 a second culture showed *Staphylococcus aureus* with not as many colonies as in the first culture. The blood sulfanilamide concentration at this time was 5 milligrams per hundred cubic centimeters.

The patient was given sulfanilamide during this time and had transfusions of 250 cc. of blood every other day. His temperature varied from 102 F. to 103 F. and on August 29 fluctuation was detected on the lateral side of the left thigh. The same day, under local anesthesia, an incision was made and 300 cc. of thin yellow pus was evacuated. Warm moist dressings were again started.

Following this procedure the leg drained thin yellow pus in increasingly smaller amounts and the temperature slowly receded. Blood sulfanilamide determinations were reported as 10.5 mg. August 26, August 29 and September 1.

A third blood culture was reported August 26 as showing *Staphylococcus aureus haemolyticus*, and culture from the pus of the abscess showed *Staphylococcus aureus*, slightly hemolytic. September 9 blood culture showed only one colony of *Staphylococcus aureus* after four days' growth. The blood sulfanilamide ranged from 10.5 mg. September 1 to 6.8 mg. September 2.

The patient made a slow but continuous improvement. September 12 there was practically no drainage from the leg, and warm moist dressings and sulfanilamide were discontinued. However, because of reports that improvement following the use of the drug was not maintained after its withdrawal, the administration of sulfanilamide was started again.

September 12 blood culture was reported as follows: "Plates sterile, slight growth of staphylococcus in broth." September 20 blood culture was sterile after seven days and on September 26 a similar report was made. October 3 the culture was sterile after eight days.

September 20 the sulfanilamide was again stopped. While the patient felt very much better, his temperature never dropped below 100 F. for any length of time and his leg still drained pus. He complained also of pain in his left shoulder, and a slightly tender swelling eventually appeared in the left axillary space.

He had received 5,450 cc. of blood in thirteen transfusions over a period of thirty-nine days. His hemoglobin rose to 72 per cent October 6.

A roentgenogram of the femur October 5 showed subacute osteomyelitis, distal two thirds, shaft of femur, with irregular bone absorption and slight periosteal thickening. The process involved the knee joint.

It was considered inadvisable for the patient to go home because of the continued elevation of temperature and axillary swelling, but he became very anxious to leave and was discharged October 7, fifty-one days after admission. He returned to the hospital October 28, twenty-one days after discharge, complaining of pain and swelling under the left arm. He was found to have marked axillary adenitis and cellulitis of the shoulder region. Roentgenograms were negative. At this time the leg wound was healed but there was little motion in the knee.

His temperature on readmission was 102.6 F. by mouth at 4 p. m. His blood count showed 52 per cent hemoglobin, 2,800,000 erythrocytes and 21,500 leukocytes, of which 94 per cent were neutrophils. Urinalysis was essentially negative.

Treatment was instituted by means of warm moist dressings to the region of the shoulder, sulfanilamide 5 grains (0.3 Gm.) every hour and blood transfusions.

An axillary abscess formed, and on November 12, fifteen days after the second admission, it was incised under local anesthesia and 200 cc. of thin yellow pus evacuated.

Blood cultures on this visit were sterile after forty-eight hours and after seven days. Culture of the pus from the abscess showed *Staphylococcus aureus*, slightly hemolytic.

Sulfanilamide was continued until November 23. The blood sulfanilamide rose to 11.8 mg. at this time. Drainage from the wound gradually subsided, leaving the shoulder joint very stiff.

He received three blood transfusions, 1,150 cc. of blood in all, at this visit. His hemoglobin, which was 52 per cent October 29, dropped to 36 per cent November 7 but rose again to 62 per cent November 17.

1. Morris, John F.: *Staphylococcus Septicemia*, West Virginia M. J., 35: 186-187 (April) 1939.

He was again dismissed from the hospital December 9, at which time the axillary wound was almost completely healed. The shoulder was very stiff. There was little motion in the left knee and some weakness of the external lateral ligament of this knee.

Because of the bad roads and inaccessibility of his home, he was not seen again until March 9, 1939, three months after leaving the hospital. At this time he had complete and painless motion in the left shoulder. He had only 20 degrees flexion of the left knee, however. The wound of the leg was healed and he walked with a cane.

He returned to the hospital May 22, at which time it was found that there was drainage again from the sinuses on the lateral surface of the thigh. The knee was stiff in a position of 165 degrees extension. He was again treated with warm moist dressings and traction and when last seen there was still some drainage of pus from the thigh.

CASE 2.—J. B., a white boy aged 15 years, was first seen by F. C. R. on the third day of his illness complaining of pain in the left upper jaw, for which he had consulted his dentist the preceding day. He was referred as having no dental lesion. His family and past histories were noncontributory except for tonsillectomy in 1937.

The patient was apparently healthy and cooperative. The left side of the face was generally swollen and red, including both eyelids. There was injection of the conjunctivae and limitation of the excursion of the eyeball. The infra-orbital area medial to the foramen was tense, and palpation yielded a sensation of fluctuation. The left side of the nose was blocked by edematous, reddened mucous membrane and seropurulent drainage. The antrum was dark on transillumination. There was some pharyngeal congestion and slight cervical adenopathy. Antral irrigation produced a few cubic centimeters of fine granular pus.

The patient was admitted to an eye, ear, nose and throat hospital the following day because of an increase in his cellulitis and a rise of temperature to 103.2 F. His blood count was reported to show 70 per cent hemoglobin, 3,900,000 erythrocytes and 14,600 leukocytes, with 86 per cent polymorphonuclear forms, 11 of which were immature. Nasal smear and cultures revealed both a streptococcus and a staphylococcus. The urine showed albumin, pus and an occasional red blood cell and granular cast.

On the fifth day of his disease the infra-orbital abscess was incised and pus evacuated. The fever level remained about 104 F. By the eighth day an abscess which had formed in the left tonsillar fossa was incised and drained profusely. The same day he developed proptosis of the right eye with marked injection, and small hyperemic areas over the left anterior superior iliac spine and right heel with scattered petechiae over the extremities. His leukocytic count was 18,400 with essentially the same differential picture. There was less albumin and pus in the urinary specimen. He became semicomatose, but his response to intravenous fluids was gratifying.

At this point he was seen by one of us (W. A. T.), and transferred by ambulance to a general hospital with a clinical diagnosis of septicemia and a cavernous sinus thrombosis, secondary to a spontaneous left infra-orbital abscess. Blood culture was taken, sulfanilamide therapy instituted, and transfusion performed. The blood culture showed 50 colonies per cubic centimeter of hemolytic *Staphylococcus aureus*. The leukocyte count was 20,400 per cubic millimeter. Eighty-six per cent of these cells were polymorphonuclears. There were 4,000,000 erythrocytes with 68 per cent hemoglobin. His blood sulfanilamide level was maintained between 4.0 and 7.65 for the first sixteen days of his second hospitalization with constant dosage. He was then given a respite of one week and returned to a steady dosage for nineteen more days. He received during the course of his illness 865 grains (56 Gm.) of sulfanilamide. Transfusions of 250 cc. of citrated blood were given on fourteen occasions between the fifteenth and fiftieth days of his illness. Bilateral proptosis prompted a diagnosis of bilateral cavernous sinus thrombosis and he had a paralysis of the left fourth nerve,

which did not clear up until some three months after his acute stage. There was also transient paralysis of his seventh and ninth nerves on the left. Ten days after his hospital transfer thick yellow pus was aspirated again from his infra-orbital abscess, and incision and drainage were performed. An acute bilateral otitis media developed but subsided without drainage.

He was discharged on the fiftieth day of his illness but continued to have a low grade fever at home for some weeks. He also had a subcutaneous infection on his right forearm, which persisted unchanged for about two weeks in spite of roentgen treatment and eventually had to be opened during his convalescence in Florida. A roentgenogram of the arm indicated periostitis. After incision and bone scraping, drainage persisted for one month. He has at this date still some periostitis and drainage from the forearm, though he otherwise is quite well.

COMMENT

It has been thought desirable to report these cases because of the failures in treating staphylococcal septicemia and because of the widespread interest in the use of sulfanilamide. How much of the credit for the cure must be given to the blood transfusions and roentgen treatment in the one case is difficult to decide. The transfusions bolstered up the patient's hemoglobin, which was attacked by both the infectious process and the sulfanilamide. The roentgen therapy undoubtedly helped to localize the abscess in the leg.

The use of so many therapeutic agents in the treatment of this disease is evidence that no one of them is effective in every case. Another point brought out by a study of the literature is that the number of cases of the disease is comparatively small and few men become proficient in its treatment. Sulfanilamide is much more easily procurable than either antitoxin or bacteriophage, and if further successes follow its use in this disease it would seem to be the method of choice.

CONCLUSION

Two patients with *Staphylococcus aureus* haemolyticus septicemia with formation of localized abscesses recovered following the use of sulfanilamide, blood transfusions and drainage of the abscesses.

SULFAPYRIDINE IN THE TREATMENT OF STAPHYLOCOCCUS AUREUS BACTEREMIA

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CHICAGO

Much interest has been aroused by the advent of sulfapyridine. Although its use has been almost limited to the treatment of pneumonic processes, its efficacy in other conditions has been briefly reported.

Instances of the use of the drug in staphylococcal septicemia or bacteremia of necessity are few and brief. Fenton and Hodgkiss¹ reported its use in a case with an atypical clinical picture. A single culture of the blood revealed *Staphylococcus aureus*. The only significant finding was x-ray evidence of pleural thickening. The temperature dropped markedly twenty-four hours after administration of the drug. O'Brien and McCarthy² reported staphylococcal bacteremia following furunculosis, with a dramatic drop in temperature and sterile blood culture following therapy with sulfapyridine. Maxwell's³ patient had staphylococcal bacteremia coincidental to pneumonia. Staphylococci were recovered from two cultures of the blood. The temperature dropped to normal in forty-eight hours and culture of the blood became sterile seven days later. Long⁴ mentions rapid sterilization of the blood after the institution

From the Surgical Service of Michael Reese Hospital.
The Department of Bacteriology, Dr. Katharine M. Howell, director, cooperated in doing the bacteriologic work.

1. Fenton, W. J., and Hodgkiss, Fred: *Lancet* 2: 667 (Sept. 17) 1938.
2. O'Brien, E. J., and McCarthy, C. J.: *Lancet* 2: 1233 (Dec. 3) 1938.

3. Maxwell, James: *Lancet* 2: 1233 (Nov. 26) 1938.

4. Long, P. H.: *Sulfapyridine*, J. A. M. A. 112: 538 (Feb. 11) 1939.

of sulfapyridine therapy in three of five patients ill with staphylococcic bacteremia. This is what he expected as a result of his experimental work with animals.

REPORT OF CASES

To these brief reports can be added our two cases:

CASE 1.—M. K., a white girl aged 28 months, entered Sarah Morris Hospital Feb. 3, 1939, with complaints of swelling and

leg, which was symmetrical from the knee to the ankle with tightly stretched skin. The anterior tibial surface was red, warm and indurated. A diagnosis of osteomyelitis with subperiosteal abscess was made.

The patient was operated on under ethylene anesthesia. A subperiosteal collection of pus was found at the upper portion of the tibia. Drill holes were made, and pus was obtained from the marrow cavity. A window of bone was cut out and

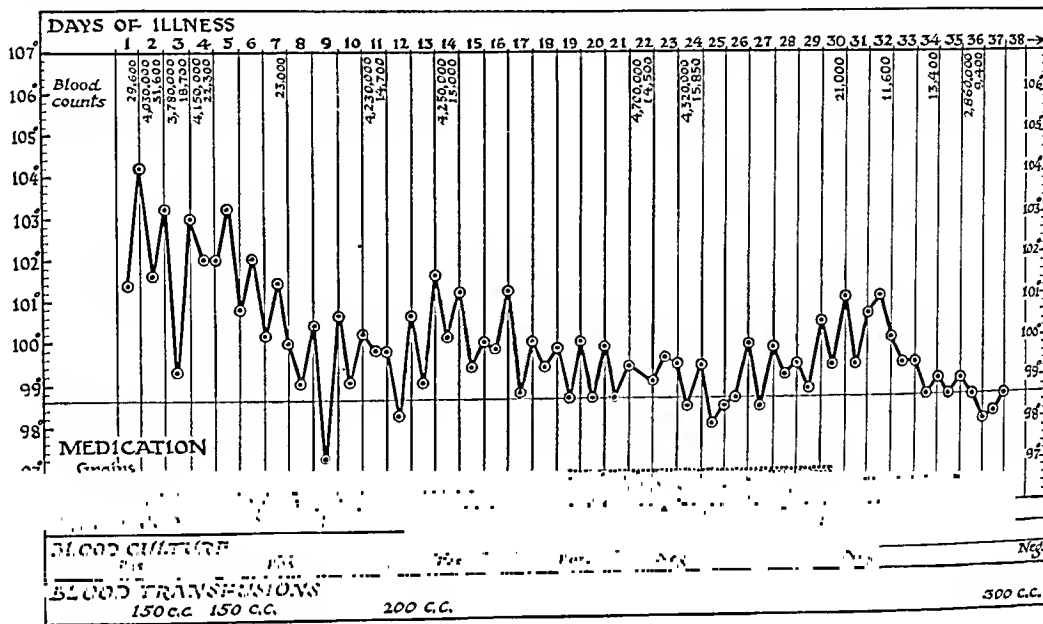


Chart 1.—Temperature, blood counts, blood culture and treatment in case 1.

pain of the left lower leg. There was a history of previous furunculosis with a large carbuncle on the buttock. One week before admission this carbuncle had been accidentally injured, following which there was purulent drainage. During the next

petrolatum packing inserted. Cultures of the pus obtained showed hemolytic *Staphylococcus aureus*.

After operation, the course was marked with daily temperature spikes from 102 to 104 F. rectally, as shown in chart 1.

Blood cultures revealed hemolytic *Staphylococcus aureus*. Multiple small transfusions of citrated blood were given and large doses of sulfanilamide were started. Although the temperature dropped slowly, the patient continued to be very toxic and the blood cultures continued positive for *Staphylococcus aureus*.

Since the sulfanilamide over a long period did not sterilize the blood stream, it was discontinued. In an effort to accomplish this sterilization, treatment with sulfapyridine was begun. This 30 pound (13.6 Kg.) child was given 45 grains (3 Gm.) of sulfapyridine daily in six divided doses. On the fifth day blood culture was negative. The same dosage was continued for six more days when the temperature, which had been dropping, reached normal and the toxicity disappeared. The dose was then reduced to 30 grains (2 Gm.) daily for five days and then stopped. There was never any vomiting. The general condition improved rapidly in spite of an upper respiratory infection and fever for several days. During the period of sulfapyridine therapy

all other medications were discontinued except for hot wet dressings locally. Because of the anemia, a blood transfusion was given at the end of the course of sulfapyridine.

CASE 2.—E. M., a white boy aged 11 years, who entered Sarah Morris Hospital May 5, 1939, had a severe chill one week previously, followed by a rise in temperature. The next day there was pain, swelling and redness of the anterior aspect

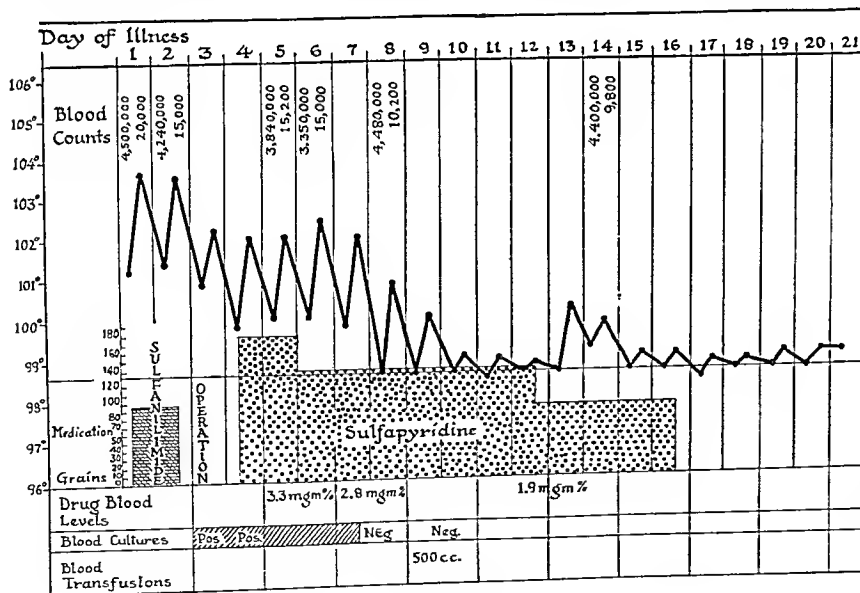


Chart 2.—Temperature, blood counts, blood culture and treatment in case 2.

three days the patient had a series of chills with high temperature and anorexia. Following this she developed pain, and then swelling of the left leg from the knee to the ankle. The history is otherwise irrelevant.

Physical examination on admission revealed a rectal temperature of 104.2 F. There were no abnormalities other than a healing infection of the buttock and the swelling of the left

of the right lower leg. These became more pronounced daily, with a gradual rise in the rectal temperature to 104 F. There was no history of recent trauma, upper respiratory infection or furunculosis.

Physical examination revealed a rectal temperature of 103.6 F. The child was sick and toxic. Significant abnormalities were limited to the right lower leg. It was tense with swelling, red and hot. There was marked tenderness, which seemed superficial. Roentgenologic examination revealed no bone involvement. Cellulitis of the leg was the tentative diagnosis.

Massive hot wet dressings were applied to the local lesion. One hundred grains (6.5 Gm.) of sulfanilamide (1 grain per pound of body weight) was given in the first twenty-four hour period. The next day (May 6) fluctuation was evident and the localized abscess was incised. Eight ounces (235 cc.) of thick pus was evacuated. Culture of this pus revealed *Staphylococcus aureus*. The next day (May 7) there was a drop in the rectal temperature to 102.2 F. (chart 2) but the boy looked very sick. Blood drawn for culture May 7 and again May 8 revealed *Staphylococcus aureus* bacteremia.

On the afternoon of May 8 sulfapyridine therapy was begun. A total of 270 grains (18 Gm.) was given by mouth in nine divided doses the first thirty-six hours, after which the daily dose was reduced to 135 grains (9 Gm.).

May 9 the boy complained of pain in his right elbow. Examination revealed swelling, redness and tenderness. Hot moist dressings were applied. The local condition improved and seventy-two hours later all the signs of inflammation had completely subsided.

May 12, the fourth day following institution of sulfapyridine therapy, blood drawn for culture was sterile. There was a decided drop in temperature to 100.8 F., with marked improvement in the general condition. Repeated blood cultures May 13 and 15 remained sterile. May 14 the dose of sulfapyridine was reduced to 90 grains (6 Gm.) daily for the next three days.

The temperature dropped to normal May 15 and remained so until May 21, when it rose to 101 F. Roentgenologic examination of the leg and elbow at this time revealed osteomyelitis of the tibia and ulna. Sulfapyridine was again given in daily doses of 90 grains for three days, when the temperature again became normal. The leg improved during this period, there was less drainage, and the arm showed no recurrence of any signs of inflammation.

COMMENT

The effect of sulfapyridine on the local lesion is something regarding which little is known. The lesion of the ulna in case 2 interested us greatly. Signs of inflammation appeared over night and disappeared completely within three days, leaving no residue of either subjective or objective symptoms, and yet twelve days later there was definite roentgenologic evidence of bone destruction, which is progressing slowly and will probably require drainage. This phenomenon may prove a very valuable aid in the treatment of acute osteomyelitis, especially as the recent trend seems to be toward conservative management. Whether sulfapyridine will be of any value in reducing the duration of osteomyelitis is as yet an open question.

We realize the pitfalls of reporting only two instances of sterilization of the blood stream in *Staphylococcus aureus* bacteremia and claiming effectiveness for any therapeutic agent. Unquestionably the blood stream is sterilized by normal body defense mechanisms more often than we realize.⁵ Instances of such sterilization after the use of staphylococcus antitoxins are being reported in the literature more frequently. However, the change in the clinical pictures in these cases was striking enough to lead us to believe that sulfapyridine was instrumental in sterilizing the blood stream. The disease is one which has a high mortality, and any agent which might have any beneficial effect is worthy of further investigation, especially since the meager investigative work done so far would point to some specific action of this drug against the staphylococcus. Proper evaluation of the effectiveness of the drug can be made only on a large group of cases.

TREATMENT OF FRIEDLÄNDER'S SEPTICEMIA BY SULFAPYRIDINE WITH RECOVERY

KARL A. MEYER, M.D., AND LEO AMTMAN, M.D., CHICAGO

Septicemia resulting from *Bacillus mucosus capsulatus* (Friedländer's bacillus) is rare. It is in the French literature that one finds the most frequent reports. Colombe¹ in 1917 collected sixty cases from the world's literature, of which twenty-five were diagnosed during life by a positive blood culture. Causade, Joltrain and Surmont² collected fifteen new cases which occurred from 1917 to 1924 and reported their own case. Since then a case has been reported by Creyx³ and another by Lereboullet and Pierrot⁴ in which recovery occurred. In 1924 Lereboullet and Denoyelle⁵ reported two cases in children who recovered. In 1928 Mason and Beattie⁶ reported their own fatal case, in which the portal of entry of the organism was not determined. They reviewed the literature and made mention of the fact that the "occurrence of septicemia from infection with *Bacillus mucosus capsulatus* is not generally recognized in Canada." Apparently up to 1927 there are only a few cases of Friedländer's septicemia in which recovery has occurred. In 1934 Baehr, Schwartzman and Greenspan⁷ cited sixteen cases of *B. Friedländer* bacteremia, with recovery in four. Three of the patients who recovered had infections of the kidney and urinary passages. The authors point out that blood invasions from this source are often transient and that in two of the cases the organism was recovered from the blood stream only on the day following a urethral or ureteral chill. The other patient who recovered had an infection of the biliary passages. Kolmer⁸ lists *Bacillus mucosus capsulatus* as an organism producing one of the rarer septicemias. He totals observations in 282 cases of septicemia. He states that case reports dealing with blood stream infections due to *Bacillus mucosus capsulatus* are uncommon and that reports showing complete recovery are rare. Since 1934 approximately twelve cases of this type of septicemia have been reported in the literature.⁹

From Grant Hospital and the Department of Medicine of the University of Illinois College of Medicine.

1. Colombe, J.: Les septicémies pneumobacillaires, Paris thèse, 1917, No. 29 de la bibliothèque de la Faculté de médecine de Paris.

2. Causade, G., Joltrain, E., and Surmont, J.: Septicémie à pneumobacille de Friedländer, Bull. et mém. Soc. méd. d. hôp. de Paris 48: 148 (Feb. 8) 1924.

3. Creyx, M.: Sur un cas de pneumobacillémie, Compt. rend. Soc. de biol. 94: 596 (March 12) 1926.

4. Lereboullet, P., and Pierrot, M.: Un nouveau cas de septicémie à pneumobacille de Friedländer terminée par la guérison, Bull. et mém. Soc. méd. d. hôp. de Paris 51: 128 (Feb. 10) 1927.

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6. Mason, E. H., and Beattie, W. W.: Septicemia Due to a Strain of the *Bacillus Mucosus Capsulatus* Group in a Case of Diabetes Mellitus, Arch. Int. Med. 42: 331-337 (Sept.) 1928.

7. Baehr, George; Schwartzman, G., and Greenspan, E. B.: Role of *Bacillus Friedländer* in Infections, Tr. A. Am. Physicians 48: 353-354, 1933.

8. Kolmer, John A.: Ann. Int. Med. 8: 612-631 (Nov.) 1934.

9. These cases have been reported by:

Raillet, Pérono and Morel: Septicemia and Meningitis Due to Friedländer's *Pneumobacillus*: Case, Bull. et mém. Soc. méd. d. hôp. de Paris 50: 1693-1695 (Dec. 24) 1934.

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Hepp, J.: Uterine Gangrene and Septicemia Due to Friedländer's *Bacillus* Following Criminal Abortion: Case, Ann. d'anat. path. 13: 116-121 (Jan.) 1936.

Germain, A., and Maudet, J.: Septicopyemia Due to Friedländer's *Bacillus*: Case with Initial Genito-Urinary Localization and Multiple Secondary Manifestations, Bull. et mém. Soc. méd. d. hôp. de Paris 52: 1253-1259 (July 20) 1936.

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Pfeiffer, D. B.: Klebsiella Pneumoniae (*Bacillus Mucosus Capsulatus*) Bacteremia Due to Prostatic Abscess: Case with Recovery, Ann. Surg. 106: 1115-1118 (Dec.) 1937.

Bonciu, C.: Septicemia Due to Friedländer's *Bacillus* with Vegetating Ulcerative Aortic Endocarditis Causing Sudden Death (Case), Arch. rom. de path. exper. et de microbiol. 10: 307-323 (Sept.) 1937.

Mamone, M., and Perez Fernandez, J.: Postabortal Septicemia Due to *Bacillus Capsulatus* Friedländer Type: Case, Rev. sid. a. d. endocrinol. 20: 125-131 (March 15) 1937.

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Giroux, M.: Septicemia Due to Friedländer's *Bacillus* and Previtaminosis, Laval méd. 3: 163-166 (May) 1938.

Jobin, J. B., and Paquet, B.: Septicemia Due to Friedländer's *Bacillus*: Case, Laval méd. 3: 151-162 (May) 1938.

5. Reichel, H. A.: Proc. Staff Meet., Mayo Clin. 14: 138 (March 1) 1939.

REPORT OF CASE

L. N., a man aged 55, was first seen at home May 6, 1939, with a history of a sudden onset of septic temperature of eleven days' duration. There were no symptoms which would point to acute infection of the upper respiratory tract. For one week he had a violent chill on the average of once every day, usually in the evening but not at the same time. The chill, which lasted from twenty to forty-five minutes, was always followed by a fever of 103-104 F. and profuse sweats. When first seen at home, the patient appeared toxic with a temperature of 103 and pulse of 100. The only positive manifestations were diffuse dry rales and an occasional moist rale throughout the chest, especially in the lower lobes, and slight tenderness in the right upper quadrant of the abdomen. The spleen was enlarged on percussion. The condition in the chest persisted even after recovery, and this was interpreted as a chronic bronchitis. There was no expectoration. It was observed that the temperature between the paroxysms was almost normal. Smears were made for malaria, but no parasites were found. The therapeutic test with quinine was negative. X-ray examination of the sinuses and chest were negative.

May 8, at the patient's home, blood was drawn for routine agglutination tests and beef broth was inoculated for culture. The laboratories of the Chicago Board of Health reported



Smear from blood culture; Gram stain.

Bacillus mucosus capsulatus isolated from the broth culture and also from the blood clot in the specimen submitted for the agglutination tests. Smears showed a gram-negative short thick bacillus with a definite capsule. It fermented all the sugars except lactose. A mouse inoculated subcutaneously with the organism was found dead the next morning. A positive culture was obtained from the heart's blood.

The patient was removed to the hospital May 10. Blood culture done on the same day showed the same organism. A third culture May 12 after treatment was started showed only a few colonies of the same organism after ten days' incubation.

At 9 p. m. May 11, shortly after a severe chill, sulfapyridine was started with 30 grains (2 Gm.), followed by 15 grains (1 Gm.) every four hours, day and night. There were no more chills. After forty-eight hours the temperature remained normal with the exception of a single rise to 102 on the fifth day following institution of treatment. The drug was therefore continued until 9 a. m. May 22. Complete blood counts and urine examinations were done daily. There were no untoward effects observed from the drug. The patient has remained well to the date of this writing.

COMMENT

With no definite specific treatment for Friedländer's septicemia outlined in the literature, we felt that on the basis of

the recent experimental work on mice infected with pneumococci and treated with sulfapyridine the clinical use of this drug was justified in our case. Whitby¹⁰ states that in pneumococcal infections the drug acts by bringing about degenerative changes in the capsular material of the pneumococcus. Fleming¹¹ and Long¹² unable to confirm this, did note that the multiplication of susceptible organisms is hampered both in vivo and in vitro following the administration of sulfapyridine to mice or culture mediums. Long therefore suggests that careful therapeutic trials of the effects of sulfapyridine in Friedländer's bacillary infections seem warranted. This we did with presumptive success. We therefore report this as a proved case of *Bacillus mucosus capsulatus* (Friedländer's) septicemia with portal of entry unknown, which was treated with sulfapyridine and ended in recovery.

30 North Michigan Avenue—185 North Wabash Avenue.

A METHOD OF TIMING HEART MURMURS

BERNARD FARFEL, M.D., HOUSTON, TEXAS

It seems that many physicians have little difficulty in learning to recognize normal heart sounds or in detecting the presence of a cardiac murmur but often their determination of the time of a murmur in the heart cycle is faulty. Cabot¹ states that the commonest of all errors in diagnosis of diseases of the heart is the misinterpretation of systole for diastole.

In routine examinations, many physicians rely on the ear alone, calling on palpation or observation of the apex, carotid or radial impulse when in doubt. That present clinical procedure is not entirely satisfactory is borne out by the frequent errors every physician sees or makes himself. Mackenzie² writes from his experience with recognized internists that many doctors never acquire the ability to time murmurs. Warfield, writing in Tice,³ points out the possibility of mistaking a seesaw murmur in mitral stenosis with regurgitation for a prolonged systolic murmur. It would be presumptuous to dwell on the importance of proper timing of murmurs for physical diagnosis.

The method I am about to describe requires none of the intricate types of apparatus that have been devised. It requires nothing that the physician does not ordinarily have at the bedside. My own experience with palpation coincident with auscultation has been one of difficulty in correlating the two sensations so as accurately to time the murmurs I hear. I felt that I would better be able to time the murmurs heard were I able to employ vision in conjunction with hearing, and I particularly sought some method which could be used in all cases. I have utilized the method to be described in numerous instances and have found it useful. I taught the method to several of my associates, with gratifying results.

Briefly, the following technic is employed: After I have taken the patient's blood pressure, I leave the cuff in place and set the mercury column at about midway between the systolic and diastolic blood pressure readings. This is done so as to obtain good excursions of the column with each beat. If one listens to the normal heart, it will be found that the upward excursion of the mercury column is coincident with the second heart sound. In this way one has already established a point at which systole ends. Cabot¹ teaches that the mistaking of systole for diastole would not occur if the physician were sure just when systole takes place. Knowing that the second heart sound and the impulse given to the mercury are coincidental, one should note whether the murmur in question immediately precedes this phenomenon, as would be true of a systolic murmur, or follows it, which would be the case with a diastolic murmur.

10. Whitby, Lionel: *Lancet* 2: 1095 (Nov. 12) 1938.

11. Fleming, Alexander: *Lancet* 2: 74 (July 9), 564 (Sept. 3) 1932.

12. Long, Perrin H.: *Sulfapyridine*, *J. A. M. A.* 112: 535 (Feb. 19) 1939.

1. Cabot, R. C.: *Physical Diagnosis*, Baltimore, William Wood & Co., 1931.

2. Mackenzie, Sir James: *Diseases of the Heart*, Edinburgh, Oxford University Press, 1925.

3. Tice, Frederick: *Practice of Medicine*, Hagerstown, Md., W. F. Prior Company, vol. 6, 1921.

That the second sound is dependent on aortic tension is pointed out by Howell,⁴ who quotes Williams' work on animals in which he shows that the second sound disappeared as an animal bled to death and the heart failed to throw out a sufficient supply of blood to maintain aortic tension. That the sudden thrust upward of the mercury should occur at the moment when the second sound takes place may be at least partially explained physiologically. Best and Taylor⁵ describe the rebound of the distended aortic wall at the close of systole, causing the aortic valves to close and forcing the blood along to the periphery as well.

It will also be observed, in using the method described, that the period during which the mercury falls slightly, just prior to the sudden rise, will usually coincide fairly well with the interval between the first and second sounds, namely systole. The technic given offers another means of timing murmurs. This communication is forwarded in the hope that a method that has proved useful to many of my associates and myself may be of some aid to others.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

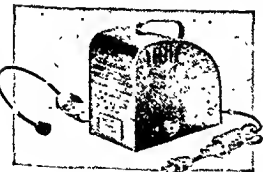
RAVOX HEARING AID ACCEPTABLE

Manufacturer: Zenith Radio Corporation, 6001 Dickens Avenue, Chicago.

Description.—The Ravox Hearing Aid is supplied with power through a cord which connects to a nominal 110 volt, 60 cycle, alternating current electric light receptacle. On measurement it was found that the power consumption was 20 watts. The Ravox unit is housed in a formed sheet metal case of somewhat irregular shape but attractive design. The weight of the unit is 5½ pounds and the overall dimensions are approximately 4½ by 7 by 9 inches. A crystal type watch case receiver with head band plugs into a pair of phone jacks at the rear of the device. The microphone operates on the condenser principle and is suspended by means of shock absorbing coil springs directly behind a cloth covered grill located in the front face of the unit. The amplifier has three tubes of standard make.

The amplifier is provided with a combination shut-off switch and tone control located at the rear of the housing and a volume control knob located at the side.

Performance Tests.—Both single frequency response tests and speech tests (articulation and intelligibility) were made. For the single frequency tests the Ravox unit was suspended by its handle within a chamber which is substantially free from standing waves and excited by pure tones produced by a loud speaker unit and oscillator. The measured amplifications obtained with the volume control full on and with the tone control set for maximum high frequency gain are shown on the accompanying graph. Corresponding amplification determinations were made with the tone control set for minimum high frequency response, and it was found

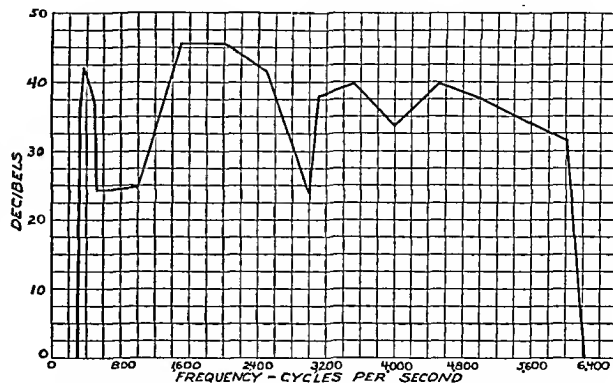


Ravox Hearing Aid.

that above 2,000 cycles the amplification was reduced on the average by approximately 15 decibels, whereas below 1,000 cycles the gain was substantially unaltered. By direct listening it was observed that for each test frequency the sound output was quite pure and substantially free from harmonics or subharmonics, but there was present a hissing or rushing noise which interfered with the test tone when the output intensity fell to about the input intensity.

The performance of the Ravox hearing aid in transmitting speech sounds and sentences was very good. Thus with the

instrument adjusted for maximum high frequency response and placed in a small room having good acoustic properties, with observers having normal hearing in another room listening to the output, it was found that it was necessary to reduce the amplification approximately 45 decibels to produce a loudness in the Ravox receiver judged to be equal to loudness of speech when directly listened to. Under these circumstances the



Measured amplifications obtained with volume control full on and with tone control set for maximum high frequency gain.

inherent rushing sound previously mentioned was not objectionable and it was found that consonant-vowel-consonant syllables were transmitted over the Ravox with an almost perfect score. In fact no substantial difference in score was obtained when one was listening alternately to the sounds directly and over the Ravox link. Ordinary speech was likewise transmitted very efficiently. Hence it is concluded that the significant speech frequencies are transmitted by the Ravox hearing aid without admixture of disturbing sounds and amplification of approximately 45 decibels.

In view of the foregoing report, the Council on Physical Therapy voted to include the Ravox Hearing Aid in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

ASCORBIC ACID (See New and Nonofficial Remedies, 1939, p. 499).

Ascorbic Acid-Squibb.—A brand of ascorbic acid-N. N. R.

Manufactured by E. R. Squibb & Sons, New York City. No U. S. patent or trademark.

Tablets Ascorbic Acid-Squibb, 25 mg.: Each tablet is equivalent to 500 international units of vitamin C.

Tablets Ascorbic Acid-Squibb, 50 mg.: Each tablet is equivalent to 1,000 international units of vitamin C.

SULFAPYRIDINE-LEDERLE (See THE JOURNAL, June 24, 1939, p. 2603).

The following dosage form has been accepted:

Capsules Sulfapyridine-Lederle, 0.25 Gm.

COD LIVER OIL (See New and Nonofficial Remedies, 1939, p. 506).

I. V. C. Cod Liver Oil.—It has a vitamin A potency of not less than 2,250 units (U. S. P.) per gram and a vitamin D potency of not less than 260 units (U. S. P.) per gram.

Dosage.—For adults, 8 cc. (2 fluidrachms) daily; for children, 4 cc. (60 minims) daily.

Prepared by the International Vitamin Corporation, New York. No U. S. patent or trademark.

I. V. C. cod liver oil complies with the U. S. P. standards for cod liver oil. In addition it is required to have a vitamin A potency of not less than 2,250 units per gram and a vitamin D potency of not less than 260 units per gram.

4. Howell, W. H.: *Textbook of Physiology*, Philadelphia, W. B. Saunders Company, 1907.

5. Best, C. H., and Taylor, N. B.: *Physiological Basis of Medical Practice*, Baltimore, William Wood & Co., 1937.

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SATURDAY, OCTOBER 28, 1939

EFFECTS OF AIRPLANE NOISE ON AVIATORS

Experiments have shown that prolonged stimulation of the ear by intense sound causes cochlear degeneration resulting in deafness. Bauer¹ in 1926 said that the constant noise of high powered airplane motors causes diminution in hearing. At first this deafness gradually wears off after a few hours, but constant flying without protection for the ears leads to permanent impairment of hearing. Kawata² subjected guinea pigs to noise for a month and on microscopic examination found complete degeneration of the organ of Corti at the point of transition from the basal turn to the second coil of the cochlea.

Recently British investigators Dickson, Ewing and Littler³ said that noise produced by certain types of multi-engined aircraft has been measured and found to reach loudness levels which are injurious to human ears. The loudness levels produced by various types of aircraft have been measured and have shown intensities of from 110 to 135 phons. Tests carried out on members of the Royal Air Force even after a few hundred hours of regular flying without helmets in enclosed cock pits showed a persistent loss of hearing for high tones. The observations included a complete aural examination in addition to audiometric tests. The subjects themselves were not always aware that their auditory acuity was impaired. This form of auditory defect probably is progressive in character as long as the patient continues to fly or to tune noisy aircraft. As the intensity and duration of the fatiguing sound was increased, all subjects showed a succession of phenomena. First there is an intensity value at C³, about 100 decibels above the threshold of audibility, exposure to which for as little as two minutes leads to aural fatigue involving subsequent depression of response.

1. Bauer, J. H.: *Aviation Medicine*, Baltimore, Williams & Wilkins Company, 1926, p. 157.

2. Kawata, Seiichi: *Experimentelle Studien über die Lärmschädigungen des Gehörorgans*, Jap. J. M. Sc. 2: 77 (Sept.) 1937.

3. Dickson, E. D., Dalziel, Ewing, A. W. G., and Littler, T. S.: *The Effects of Aeroplane Noise on the Auditory Acuity of Aviators: Some Preliminary Remarks*, J. Laryng. & Otol. 54: 531 (Sept.) 1939.

Prolongation of the fatiguing sound beyond this point or further increase in its intensity causes greater immediate loss of sensitivity and slower recovery, until temporary deafness becomes chronic; still further increase in intensity brings about cochlear degeneration. The greatest hearing losses recorded in audiometric tests by the British investigators of patients suffering from traumatic deafness are almost always found in the frequency of C⁵.

Noise in connection with flying arises from three sources, the engine exhaust, the propeller and the wind (slip stream). Tests were made to determine the amount of protection of hearing provided by the standard pattern of flying helmet and other ear protectors and also to determine what protection can be afforded by simple ways of blocking the ear or packing the meatus. They learned that packing the meatus with absorbent cotton smeared with petrolatum was a quick, safe and efficient method. Audiograms of aviators using a helmet of the high altitude type with the ear phones attached showed no loss for high tones. The effect of noise on the ear seems to depend to some extent on the relative position of the aviators in the airplane. If the aviators sit well forward and in front of the engines, the effect is considerably less severe than if they sit below or between the engines. Investigation is being continued in the hope of finding still more effective methods of protecting the ears of aviators.

CARDIAC NEUROSIS

Cardiac neurosis is especially baffling in the patient in whom it is associated with organic heart disease. In a recent study of this problem, Schnur¹ has suggested a procedure which may prove to be valuable in the differentiation of the symptoms and signs of the neurosis from those of the organic disease. The chief precipitating cause of cardiac neurosis in a person suffering from heart disease, he points out, is professional exaggeration of the severity of the process. Pain is more frequently a presenting symptom in cardiac neurosis than in organic heart disease, except in coronary thrombosis. Among other symptoms more common in neurosis are weakness, sighing respiration, insomnia, ringing or pounding in the ears, and faintness, dizziness, nervousness, irritability and flushes. Deep tenderness in the inframammary area in his group of patients was elicited in only 5 per cent of patients having organic heart disease, as contrasted with 80 per cent of those suffering from neurosis alone. Similarly, superficial hyperalgesia was demonstrated in less than 2 per cent of those with organic disease, whereas the incidence in cardiac neurosis was 68 per cent. This frequent hyperalgesia suggested the intradermal injection of procaine hydrochloride into the affected area. Immediate disappearance of hyperalgesia, tenderness

1. Schnur, Sidney: *Cardiac Neurosis Associated with Organic Heart Disease*, Am. Heart J. 18: 153 (Aug.) 1939.

and pain resulted; also the symptoms not associated with the precordium which had been regarded as neurotic in origin disappeared. It was usually found unnecessary to inject the entire hyperalgesic area. Furthermore, ethyl chloride spray and, at times, saline solution intradermally and the oral administration of a red placebo were found equally effective. Cardiac neurosis, he concludes, is therefore a distinct entity with characteristics which can be recognized even in the presence of organic heart disease by the following criteria: an inherited or acquired predisposition to neurosis; a definite precipitating factor; symptoms such as inframammary pain and the others mentioned; inframammary tenderness and hyperalgesia; and, finally, relief by simple procedures such as intradermal injection of small quantities of procaine hydrochloride, together with suitable suggestion, the latter being the more important.

Other aspects of this problem have been recently emphasized by Professor Ryle² in the third Croonian lecture delivered at the Royal College of Physicians this year. Ryle states that there are no good grounds for regarding simple paroxysmal tachycardia as an expression of cardiac disease or intoxication. Its intermittence, its persistence through long years without physical deterioration, its temperamental and other associations, and the absence of all organic signs bring it within the category of the neuroses. Similarly, vasovagal attacks (Gowers' syndrome) belong, he feels, in this same group. Vasovagal attacks almost invariably occur in persons who are simultaneously afflicted by some slight impairment of general physical fitness and by a chronic or recurring anxiety—thus illustrating the combined influence of several factors which would seem to underlie so many of the neuroses. The menopause, a low-grade infection or anemia, a sudden visceral disturbance, colonic irrigation, or a severe bout of seasickness may serve as precipitating factors. On this basis, Ryle suggests that some violent vasomotor disturbance with accompanying vagal effects, manifest especially in the occasional bradycardia, seem to afford the best explanation of the attacks. Multiple visceral neuroses rarely occur together in point of time. Ryle points out. They alternate in a history or appear at different periods in a patient's life. In this respect there is an essential difference between so-called allergy and the more pronounced and specific anaphylactic response. Therapy should involve, he believes, first and essentially an assured diagnosis confidently stated. The second essential is a simple and reassuring explanation of the nature and genesis of the visceral symptoms themselves and of their innocence so far as life and ultimate prospects are concerned.

The study of the visceral neuroses is, Ryle concludes, a study of men and women, of personalities and temperaments, of heredity, habits and environments, and

of peculiar biologic responses to common but often inconspicuous stimuli. Possibly the explanation of the visceral neuroses and of their tendency to be perpetuated over long periods may invoke an inborn nervous instability, the conditioned reflex or habit, endocrine imbalance, and allergic sensitivity, operating severally or in conjunction. Although with the aid of physiologic and pharmacologic experimentation better measures of counteraction and symptom-relief may be found, it is Ryle's belief that in the end the understanding and best protective contributions are likely to derive largely from a clearer knowledge of the whole man and from improved diagnostic achievement.

HUMAN REPRODUCTIVE PATTERNS

Many factors influence human reproductivity, which in the last analysis determines world populations both qualitatively and quantitatively. The results of long years of study of the biologic and statistical factors involved, interspersed with personal lines of thought which have been provoked thereby, furnishes the subject of a recent book by Pearl.¹ Both the survival urge and the reproductive urge have a fundamental biologic role in influencing reproductive patterns, and there are recognizable differences in the strength of these factors. Just as there are demonstrable differences in the libido, there is likewise no reasonable doubt of variations between individual human beings in respect to innate reproductive capacity, though these are extremely difficult to measure precisely. One definitely determining factor is the limited span of reproductive life in the human female. Less important—because it varies less frequently and to a lesser degree—is the litter size or frequency of multiple births. Closely related to libido is the frequency of coitus, which, as Pearl points out, because of the restricted period available for successful fertilization, plays a large part in determining the fertility rate. This rate varies greatly with different individuals. Another element is what Pearl calls the pregnancy or conception rate in relation to the extent of time during which it is biologically possible for a woman to become pregnant. An additional factor is that reproductive wastage which is characterized by miscarriage or abortion, or by stillbirth. This wastage is most difficult to determine with any degree of accuracy, although there is ample evidence, Pearl believes, that reproductive wastage is a biologic factor of major importance in differentially influencing fertility as realized or expressed.

Finally—and because this factor has never been adequately ascertained and is most difficult to determine—the part played by contraceptive efforts in influencing fertility is subjected by Pearl to as close analysis as circumstances would allow. The evidence available has been marshaled in impressive fashion. Although future

2. Ryle, John A.: Visceral Neuroses, *Lancet* 2: 407 (Aug. 19) 1939.

1. Pearl, Raymond: *The Natural History of Population*, New York, Oxford University Press, 1939.

additional information may lead to entirely different conclusions, Pearl's present views seem to be based squarely on the evidence presented. "One consistent broad result emerges," he says. "It is that if it were not for the effect of contraceptive efforts and the practice of criminal abortion, together with correlated habits as to postponement of marriage, there would apparently be little or no significant differential fertility as between economic, educational or religious classes of urban American married couples. In the absence of these forces the weight of the evidence as a whole is that all these socially differentiated classes would manifest about the same degree of fertility (with some possible reservations regarding the lowest educational classes). There would probably be some small residual differences, but they would not be great enough to worry any person of a realistic, practical cast of mind." This conclusion, better documented than most of similar nature, furnishes no surprise. The question whether, in essence, this differential represents a biologic phenomenon with biologic purposes or whether it can and should be altered by conscious human effort, Pearl wisely leaves unanswered.

The differential rates of fertility vary not only as between economic or social groups but also along geographic and genetic lines. It is noteworthy in this connection, however, that the greatest percentage decline in birth rates in the last third of a century has occurred predominantly in those countries having the highest previous birth rates. Likewise, the highest birth rates are now, with few exceptions, appearing in those geographic regions having the smallest population-area densities.

Whatever the relative importance of the factors influencing reproductive patterns in this country, the main facts are readily obtainable. Roughly, from 23 to 40 per cent of the women bearing products of conception in 1930 were primiparas, an obviously high proportion when viewed from the angles of race survival and population growth. Furthermore, a definite though not now precisely ascertainable proportion of these primiparas will never bear any more children. It is evident, as Pearl says, that unless a woman bears more than one child in her lifetime she is not adequately reproducing even herself, to say nothing of her family (self and consort) or her strain. If in a given year a woman produces her fourth living child, she may be regarded as having adequately reproduced, Pearl says. When the adequate reproducers, as so defined, were compared with all women who actually reproduced in the years 1920 and 1930 (on a live birth basis), little difference in the ratios of the two groups was observed. While at first surprising, in view of the lowered birth rates between these two periods, this can be explained, he believes, by the drop in the percentage of women potentially capable of being mothers who actually became

mothers in these same years, thus tending to keep the ratio more constant. To the biologist this would seem to indicate that in the population of the United States, at least, there has been no significant impairment of innate reproductive capacity in recent years, if ever, nor any serious alteration of average parity performance among the women in the population who actually reproduced at all.

In general, Pearl's analysis of the factors influencing reproductivity seems to confirm those who believe that the rapidly falling birth rate is a reflection of social, economic and other extraneous factors rather than an innate biologic phenomenon.

Current Comment

SUPREME COURT ACTS ON APPEAL FROM PROCTOR DECISION

On October 23 the Supreme Court of the United States indicated that it would not now pass on the suit brought by the Department of Justice charging the American Medical Association, through various officials and also some physicians and hospitals of the District of Columbia, as well as other medical societies, with conspiracy to violate the Sherman antitrust law by activities against Group Health Association, Inc., of Washington, D. C. The Department of Justice had appealed directly to the Supreme Court from the decision rendered by Justice Proctor of the District Court for the District of Columbia. Attorneys for the American Medical Association did not oppose this attempt by the Department of Justice.

Commenting on the decision, the *Washington Post* said:

A PROPER SETBACK

At some future date the Supreme Court may find it desirable to review the government's anti-trust case against the American Medical Association and the District Medical Society. The Department of Justice appears determined to fight Judge Proctor's decision to the last ditch. And the medical profession would certainly carry the dispute to the Supreme Court if the Proctor opinion should be overruled in the Court of Appeals.

For the present, however, the Supreme Court has quite properly declined to review the case. It sees no reason for departure from the customary judicial procedure. No constitutional issue is involved in the charges against the medical association.

The case turns merely upon interpretation of the anti-trust laws. The Department of Justice is attempting to stretch the Sherman act to provide protection for the Group Health Association against alleged restraints on the part of the organized medical profession.

Should the Supreme Court set a precedent of accepting appeals directly from the federal district courts, where no constitutional issue is involved, it would soon be overburdened with litigation. The statute giving constitutional cases a right of way to the highest tribunal makes it all the more important for the court to maintain a rigid check on other petitions for review of less vital or complicated issues.

There are many indications that the Anti-Trust Division has been unduly excited over the idea of prosecuting the medical association for alleged restraint of trade. In effect,

the Supreme Court has sustained this criticism. It found nothing in the Anti-Trust Division's petition to justify singling out this case for special attention. If the division insists upon clinging to its strained interpretation of the anti-trust laws, it will at least have to rely upon the customary procedure for final judicial clarification.

A TESTIMONIAL TO EVARTS GRAHAM

As indicated in our news columns, Dr. Evarts Ambrose Graham, Bixby professor of surgery at Washington University School of Medicine, St. Louis, was recently honored by the creation of a lectureship in his name. His contributions to the knowledge of physiology and surgery through his work on the pleura, the lung and the biliary tract are among the noteworthy contributions of the last twenty years. Moreover, his influence, through the accomplishments of his students, is worldwide. The announcement of the establishment of a Graham Lectureship to be given annually in St. Louis is a suitable recognition of his interest in education. Through this event Dr. Graham's influence in the advancement of scientific surgery will be prolonged.

POLIOMYELITIS IN THE EASTERN COTTON RAT

Successful transmission of the Lansing strain of poliomyelitis virus to the eastern cotton rat has been recently reported by Armstrong¹ from the National Institute of Health. The strain has been carried in series through seven cotton rat transfers, and animals of the eighth transfer had begun to develop symptoms at the time of reporting. Paralysis of the flaccid type developed in all. This animal is not vicious, multiplies readily in captivity, and in view of the probable interference with the importation of monkeys during the war may prove invaluable in continuing experimental investigations on infantile paralysis.

Association News

MEDICINE IN THE NEWS

The seventh season of broadcasting by the American Medical Association over the facilities of the National Broadcasting Company and affiliated stations opens Thursday November 2 at 4:30 p. m. eastern standard time (3:30 central standard time, 2:30 mountain time and 1:30 Pacific time). The title of the program will be Medicine in the News.

True to their title, the programs will consist of dramatizations based on what is happening in the world of medicine. Each program will include a principal news item from THE JOURNAL or some other reputable medical source or from *Hygeia*. This will be followed by one or more high lights on current medical news. Each program will close with a question of the week drawn from the question and answer correspondence of *Hygeia*. A question will be asked each week and answered the following week.

Since the program will be based on events as they proceed, it will be impossible to announce program topics in advance. Each program will be developed within the week immediately preceding its appearance and in part, perhaps, the programs will often be developed within forty-eight hours of their broadcasting.

1. Armstrong, Charles; The Experimental Transmission of Poliomyelitis to the Eastern Cotton Rat, *Sigmodon Hispidus Hispidus*, Pub. Health Rep. 54: 1719 (Sept. 22) 1939.

As heretofore, this is a sustaining program made possible through the cooperation of the National Broadcasting Company. A sustaining program brings no revenue to any radio station or to the network. Therefore radio stations, except those owned and operated by the National Broadcasting Company, are not obligated to broadcast the program. State and county medical societies should express interest in the program by letter or personal interview with the manager of the local radio station. Such evidence of local interest may be the deciding factor in broadcasting the program locally.

Following is a list of the radio stations affiliated with the Blue network of the National Broadcasting Company. This is a list of stations to which the program is available, not a list of stations which are certain to broadcast the program. A list of stations announcing intention to broadcast the program will be published in a later issue of THE JOURNAL.

Basic Blue Network		WTAR	Norfolk, Va.
WBAL	Baltimore	WCOA	Pensacola, Fla.
WBZ	Boston	KROC	Rochester, Minn.
WICC	Bridgeport, Conn.	KELO	Sioux Falls, Iowa
WBEB	Buffalo	KSOO	Sioux Falls, Iowa
WMT	Cedar Rapids, Iowa	KFAM	St. Cloud, Minn.
WENR	Chicago	WBOW	Terre Haute, Ind.
WTS	Chicago	WSPD	Toledo, Ohio
WHK	Cleveland	KANS	Wichita, Kan.
KSO	Des Moines, Iowa	WBRE	Wilkes-Barre, Pa.
WXYZ	Detroit	WORK	York, Pa.
WOVO	Fort Wayne, Ind.		
WREN	Kansas City, Mo.	Other Chicago Stations	
WTCN	Minneapolis	WCFL	Chicago
WJZ	New York		
WFIL	Philadelphia	Southeastern Group	
KDKA	Pittsburgh	WCSC	Charleston, S. C.
WEAN	Providence, R. I.	WSOC	Charlotte, N. C.
WHAM	Rochester, N. Y.	WIS	Columbia, S. C.
WBZA	Springfield, Mass.	WFBC	Greenville, S. C.
KWK	St. Louis	WPTF	Raleigh, N. C.
WSYR	Syracuse, N. Y.		
WMAL	Washington	North Mountain Group	
Basic Blue Supplementaries		KGHL	Billings, Mont.
WABY	Albany, N. Y.	KIDO	Boise, Idaho
WELL	Battle Creek, Mich.	KGIR	Butte, Mont.
WBCM	Bay City, Mich.	KPFA	Helena, Mont.
WLEU	Eric, Pa.	KSEI	Pocatello, Idaho
WFDF	Flint, Mich.	KTFI	Twin Falls, Idaho
WIBM	Jackson, Mich.		
WJTN	Janestown, Va.	South Mountain Group	
WJIM	Lansing, Mich.	KOB	Albuquerque, N. M.
WNBC	New Britain, Conn.	KTSM	El Paso, Texas
WMFF	Plattsburg, N. Y.	KGHF	Pueblo, Colo.
WRTD	Richmond, Va.		
KMA	Shenandoah, Iowa	California Valley Group	
Pacific Coast Blue Network		KERN	Bakersfield
KECA	Los Angeles	KMJ	Fresno
KFX	Portland, Ore.	KFBK	Sacramento
KFSD	San Diego, Calif.	KWG	Stockton
KGO	San Francisco		
KTMS	Santa Barbara, Calif.	Additional to Pacific Networks	
KJR	Seattle	KMED	Medford, Ore.
KGA	Spokane	KTAR	Phoenix, Ariz.
		KVOA	Tucson, Ariz.
Blue Southwestern Group		Special Hawaiian Service	
KGKO	Dallas-Fort Worth	KGU	Honolulu
KXYZ	Houston, Texas		
KTOK	Oklahoma City	Special Cuban Service	
Blue Southern Group		CMX	Havana
WAGA	Atlanta, Ga.		
WJBO	Baton Rouge, La.	Canadian Service	
WSGN	Birmingham, Ala.	CBF	Montreal
KTHS	Hot Springs, Ark.	CBM	Montreal
WMPS	Memphis, Tenn.	CFCF	Montreal
WDSU	New Orleans	CBT	Toronto
		CBK	Watrous, Sask.
Blue Mountain Group		Florida Group	
KVOD	Denver	WJAX	Jacksonville
KFEL	Denver	WLAK	Lakeland
KLO	Ogden, Utah	WIOD	Miami
KUTA	Salt Lake City	WFLA	Tampa
		WSUN	
Basic Supplementaries (Optional Red or Blue)		Northwestern Group	
WSAN	Allentown, Pa.	KFYR	Bismarck, N. D.
WRDO	Augusta, Me.	WDAY	Fargo, N. D.
WLBZ	Bangor, Me.		
WGBV	Charleston, W. Va.	Individual Supplementaries	
WLTV	Cincinnati	KGNC	Anarillo, Texas
WSAI	Cincinnati	KIDM	Beaumont, Texas
WBLK	Clarksburg, W. Va.	WAFB	Chattanooga, Tenn.
WCOL	Columbus, Ohio	KRIS	Corpus Christi, Texas
WING	Dayton, Ohio	WROL	Knoxville, Tenn.
WEBC	Duluth, Minn.	WALA	Mobile, Ala.
WGBF	Evansville, Ind.	KOAM	Pittsburg, Kan.
WGL	Fort Wayne, Ind.	KGBX	Springfield, Mo.
WOOD	Grand Rapids, Mich.	KRGV	Weslaco, Texas
WKBO	Harrisburg, Pa.		
WGAL	Lancaster, Pa.		
WIBA	Madison, Wis.	Mid-South Group	
WFFA	Manchester, N. H.	WAVE	Louisville, Ky.
KYSM	Mankato, Minn.	WSM	Nashville, Tenn.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Funds for Cancer Research.—The University of California has received \$27,166 in gifts for cancer research by Ernest O. Lawrence, Ph.D., professor of physics and director of the radiation laboratory, it was announced October 5. The U. S. Public Health Service gave \$23,000 for cancer work under the provisions of the National Cancer Institute Act and the Rockefeller Foundation gave \$4,166. Other donations included \$5,000 by the General Education Board, New York, for the Institute of Child Welfare; \$3,000 for research on sylvatic plague at the Hooper Foundation by the Rosenberg Foundation; \$900 to the Institute of Child Welfare by the Josiah Macy Jr. Foundation, and \$3,750 for research by Dr. Herbert M. Evans on hormones, by the Rockefeller Foundation.

Southern California Medical Association.—The one hundred and first semiannual convention of the Southern California Medical Association will be held at the Samarkand Hotel, Santa Barbara, November 3-4. The guest speakers will be Drs. William Edward Chamberlain, professor of radiology and roentgenology, Temple University School of Medicine, Philadelphia, and Frank J. Heck, hematologist at the Mayo Clinic, Rochester, Minn. They will discuss respectively "Pitfalls in X-Ray Diagnosis" and "Treatment of Pernicious Anemia and the Iron Deficiency Anemias." Other speakers will include:

- Dr. Harold E. Crowe, Los Angeles, Short Hospitalization for Fractures.
- Dr. Ralph V. Byrne, Los Angeles, Surgical Concepts of Hyperthyroidism.
- Dr. James Norman O'Neil, Los Angeles, Intraperitoneal Rupture of the Urinary Bladder as Encountered by the General Surgeon.
- Dr. Pierre P. Viole, Los Angeles, Use of Human Convalescent Scarlet Fever Serum in Streptococcal Infection of the Ear, Nose and Throat.
- Dr. Louis E. Martin, Los Angeles, Serum Therapy versus Sulfapyridine Therapy in Pneumonia.
- Dr. William P. Thompson, Los Angeles, The Apparent Benignity of Rheumatic Fever in Southern California.
- Dr. Maurice P. Foley, Los Angeles, Present Day Concepts in the Treatment of Liver Disease.
- Dr. Charles H. Pettet, Los Angeles, Acute Abdominal Pain in Childhood.

There will be a symposium on hematology and one on intestinal obstruction.

DELAWARE

Society News.—Dr. Kenneth M. Corrin discussed the incidence of syphilis before the New Castle County Medical Society in Wilmington October 17. Dr. Norman L. Cutler showed a moving picture on ophthalmology and Drs. Oscar N. Stern and Junius A. Giles Jr. presented a case of placenta praevia.

State Hospital Observes Anniversary.—The Delaware State Hospital celebrated its fiftieth anniversary and dedicated its new chapel September 28. Included among the speakers was Dr. Edward A. Strecker, professor of psychiatry, University of Pennsylvania School of Medicine, Philadelphia, whose address was entitled "Social Implications of Psychiatry."

IDAHO

State Medical Election.—Dr. Abram M. Newton, Pocatello, was chosen president-elect of the Idaho State Medical Association at the annual meeting in Boise August 23-26. Dr. Fern M. Cole, Caldwell, was installed as president and Dr. Joseph N. Davis, Twin Falls, was elected secretary. The 1940 meeting will be held at Sun Valley.

ILLINOIS

Society News.—Dr. Samuel J. Fogelson, Chicago, addressed the Effingham County Medical Society, Effingham, October 10 on "Treatment of Gastrointestinal Ulcerative Disease Based on Modern Physiology."—The Kankakee County Medical Society was addressed October 12 by Dr. Howard A. Lindberg, Chicago, on the treatment of pneumonia.—At a meeting of the Fulton County Medical Society in Canton October 12 Dr. Leroy H. Sloan, Chicago, discussed "Neurology for the General Practitioner."—Dr. Paul H. Wosika, Chicago, addressed the Will-Grundy County Medical Society in Joliet October 6 on "Auricular Fibrillation."—At a joint meeting of the Rock Island medical and dental societies, Rock Island, October 10

Dr. Frederick B. Moorehead, Chicago, discussed "Use of Elastic Traction in the Management of Jaw Fractures and in Plastic Surgery."—Dr. Frank Deneen, Bloomington, spoke before the Madison County Medical Society in Alton October 6 on "Medical Management of Gallbladder Disease."—At a meeting of the Sangamon County Medical Society in Springfield October 5 Dr. Irvine H. Page, Indianapolis, discussed hypertension.—A symposium on medical economics was presented before the Champaign County Medical Society October 12 by Drs. Edwin S. Hamilton, Kankakee; Harold M. Camp, Monmouth, and Calvin C. Applegate, U. S. Public Health Service, Chicago.

CHICAGO

Special Lectures.—Dr. Harry Gideon Wells, professor and chairman of the department of pathology, School of Medicine of the Division of Biological Sciences, University of Chicago, will deliver the fourth Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society at the Palmer House November 13. He will discuss "A Neglected Subject, Adipose Tissue." Birdsall Holly Broadbent, D.D.S., director of the Bolton Foundation, Western Reserve University, Cleveland, will present the fourth Frank Billings Lecture of the Thomas Lewis Gilmer Foundation at the Palmer House November 24. The title of the lecture will be "Clinical Significance and a Roentgenographic Method of Measurement of Disturbances in Facial Growth."

Dr. Whitecotton Comes to University of Chicago Clinics.—Dr. George Otis Whitecotton, superintendent of the Stanford University Hospitals, San Francisco, for the last four years, has been appointed to the same position with the University of Chicago Clinics. Dr. Arthur C. Bachmeyer, director of the clinics and associate dean of the Division of Biological Sciences, has been acting as superintendent in addition to his other duties since the resignation of John C. Dinsmore in 1934. Dr. Whitecotton will manage Billings Hospital, Bobs Roberts Memorial Hospital for Children and the Max Epstein Clinic, while the supervision of Lying-In Hospital and the Home for Destitute Crippled Children will continue under other assistants to Dr. Bachmeyer. Dr. Whitecotton graduated at the Stanford University School of Medicine in 1933.

IOWA

Fracture Clinic.—The Iowa State Medical Society will hold a fracture clinic at the Hotel Fort Des Moines, Des Moines, November 8. The morning will be given over to the presentation of cases while the afternoon will be devoted to papers by visiting speakers.

Pneumococcus Study Course.—The state department of health will conduct a pneumococcus study course at the state hygienic laboratory, Iowa City, October 31-November 2. The course is intended primarily for laboratory workers and attending physicians associated with pneumonia typing stations. Funds assigned to the department through the U. S. Public Health Service make it possible to reimburse the registrants for most of the travel and other expenses incident to the course.

Campaign Against Smallpox.—A statewide program against smallpox is under way in Iowa with the cooperation of the committee on child health and protection of the Iowa State Medical Society, the state department of health, county medical societies and lay organizations, according to the *Journal of the Iowa State Medical Society*. At the 1939 session of the state society approval was given to such a campaign on the recommendation of the committee on child health and protection. The actual administration of the vaccine will take place October 30-November 11. About seventy-five of the county medical societies in the state have appointed committees to take charge of the work in their communities, and many of the societies have taken paid advertising in the local newspapers. According to the journal, Iowa for many years has ranked well at the top of the states with the highest rates, the climax being reached in 1938 when 1,170 cases of smallpox were recorded.

MICHIGAN

Course in Diagnostic Roentgenology.—The University of Michigan Medical School, Ann Arbor, announces a post-graduate course in diagnostic roentgenology October 30-November 4. Topics to be considered include the diagnosis of lesions of the lungs and pleura, examination of the heart and great vessels, and diagnosis of diseases of the chest wall, and soft tissues of the neck and mediastinal structures. Conducting the course will be Drs. Fred J. Hodges, professor of roentgenology; Vincent C. Johnson and Isadore Lampe, assistant professors, and Hobart H. Wright, instructor.

MINNESOTA

Public Health Association Meeting.—The thirty-third annual session of the Minnesota Public Health Association will be held at the Nicollet Hotel, Minneapolis, November 3, with the Hennepin County Tuberculosis Association acting as host. At the annual Christmas Seal dinner, Dr. James D. Adamson, professor of medicine at the University of Manitoba Faculty of Medicine, Winnipeg, medical director of St. Boniface Sanatorium, St. Vital, Man., and consultant in pulmonary diseases, department of pensions and national health of Canada, will speak on "War and Tuberculosis As We See It in Canada." Dr. Sidney A. Slater, Worthington, president of the Minnesota Public Health Association, will give a memorial address honoring the late Dr. Charles H. Mayo, Rochester, a former president and later honorary president of the Minnesota Public Health Association. Gov. Harold Stassen will speak and greetings will be extended by Dr. Stephen H. Baxter, Minneapolis, president of the Hennepin County Tuberculosis Association. Dr. Frank J. Hirschboeck, Duluth, a member of the state heart committee, is to be toastmaster. Distinguished Service Christmas Seal Awards for 1938 will be presented.

MISSOURI

The Evarts Graham Lectureship.—The twentieth anniversary of Dr. Evarts A. Graham as Bixby professor of surgery at Washington University School of Medicine, St. Louis, was observed with two days of scientific sessions October 11-12. At a dinner, which concluded the celebration, the establishment of the Graham Lectureship was announced. It is hoped that the first of these lectures, which will be given annually, will be delivered in the spring. About forty-five former pupils of Dr. Graham gathered from all parts of the country to attend the meeting. One representative came from Australia and others were prevented from coming by the outbreak of war. A graduate of Rush Medical College, Chicago, class of 1907, Dr. Graham has during his career been given many honors including the Leonard prize of the American Roentgen Ray Society in 1925; a gold medal of the Radiological Society of North America in 1925; a gold medal and certificate of merit of the St. Louis Medical Society in 1927, and a gold medal of the Southern Medical Association in 1933. He was chairman of the Section on General and Abdominal Surgery of the American Medical Association in 1925, president of the St. Louis Surgical Society in 1925 and of the American Association of Thoracic Surgeons in 1928. He has been co-editor of the *Archives of Surgery* since 1920; editor of the *Journal of Thoracic Surgery* since 1931 and is the author of "Empyema Thoracis" and "Diseases of the Gallbladder and Bile Ducts," as well as of many articles on his specialties.

NEW JERSEY

State Society's Clinical Conference.—The Medical Society of New Jersey will present its second Fall Clinical Conference November 9-10 in Jersey City with the Hudson County Medical Society as host. Fifteen hospitals will provide material for clinics in general surgery, general medicine, pediatrics, industrial and traumatic surgery, neurosurgery, bronchoscopy and chest surgery, obstetrics, urology and psychiatry. Clinics will be held in the afternoons at the Jersey City Medical Center. At a dinner at the Carteret Club Friday evening Dr. James F. Norton, Jersey City, will be toastmaster and Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will speak on "American Medicine and the National Government."

NEW YORK

Society News.—Dr. Konrad Birkhaug, Bergen, Norway, former associate professor of bacteriology, University of Rochester School of Medicine, addressed the Rochester Academy of Medicine October 4 on "The Use of Sulfanilamide in Experimental Tuberculosis."—Charles S. Baker, legal counsel for the Medical Society of the District of Columbia, Washington, D. C., addressed the Medical Society of the County of Monroe, Rochester, October 17 on health insurance.—Dr. George Draper, New York, addressed the Medical Society of the County of Westchester, White Plains, October 17 on "Observations from the Psychological Panel of Persons Who Develop Peptic Ulcer."

New York City

Faculty Changes at Cornell.—Joseph C. Hinsey, Ph.D., professor and head of the department of physiology at Cornell University Medical College, has been appointed professor and head of the department of anatomy to succeed the late Charles R. Stockard, Ph.D. During the present year he will also be

acting head of the department of physiology. William H. Chambers, Ph.D., has been promoted to the rank of associate professor of physiology and Kendrick Hare, Ph.D., to that of assistant professor of physiology. Dr. Hinsey took his doctorate at Washington University, St. Louis, in 1927. He was a member of the faculty of Northwestern University Medical School, Chicago, from 1927 to 1929, when he was appointed associate professor of anatomy at Stanford University School of Medicine, San Francisco. After a year he became professor at Stanford and remained there until his appointment to Cornell in 1936.

Society News.—Dr. Paul Reznikoff delivered a Friday afternoon lecture before the Medical Society of the County of Queens October 6 on "Blood Dyscrasias of Interest to the General Practitioner." Dr. James Alexander Miller spoke October 20 on "Early Diagnosis of Pulmonary Tuberculosis."—Speakers at the first fall meeting of the Medical Society of the County of Kings October 17 were Drs. Burrill B. Crohn, New York, on "Regional Ileitis: Medical Aspects, Surgical Indications"; Byrl R. Kirklin, Rochester, Minn., "Bleeding Lesions of the Intestinal Tract," and Charles W. Mayo, Rochester, Minn., "Carcinoma of the Duodenum, Jejunum and Ileum."—Dr. Benjamin R. Shore Jr. addressed the New York Surgical Society October 11 on "Carcinoma of the Breast."

OHIO

Professor Froehlich Comes to Cincinnati.—Dr. Alfred Froehlich, former professor of pharmacology, University of Vienna, has been appointed pharmacologist to the May Institute for Medical Research of the Jewish Hospital, Cincinnati. Dr. Froehlich is the discoverer of the syndrome that bears his name.

District Meeting in Cleveland.—The Fifth District of the Ohio State Medical Association held its annual meeting in Cleveland October 20. The guest speakers were Drs. Frederick Christopher, Evanston, Ill., on "Treatment of Wounds" and "Carcinoma of the Stomach," and Dr. Samuel A. Levine, Boston, on "Interpretation of a Systolic Murmur" and "Prognosis of Rheumatic Heart Disease."

Postgraduate Day.—The Summit County Medical Society is sponsoring its eighth postgraduate day at the Mayflower Hotel, Akron, November 8 with the following speakers: Drs. Wilber E. Post, professor of medicine, Rush Medical College; Charles B. Puestow, associate professor of surgery, University of Illinois College of Medicine, and George H. Gardner, assistant professor of gynecology, Northwestern University Medical School, all of Chicago.

OREGON

Society News.—Dr. Harold L. Blosser, Portland, addressed the Multnomah County Medical Society, Portland, October 4 on "Social and Economic Problems in Industrial Medicine."—Dr. Roger Anderson, Seattle, addressed the Polk-Yamhill-Marion Counties Medical Society October 10 on "Fractures of the Clavicle and Injuries in the Region of the Shoulder Joint" and on "Fractures of the Leg."—Dr. Conrad A. Loehner, Salem, addressed the Lane County Medical Society September 17 at Cottage Grove on "Barbiturates and Hypnotics."

PENNSYLVANIA

State Medical Election.—Dr. Francis F. Borzell, Philadelphia, was chosen president-elect of the Medical Society of the State of Pennsylvania at the annual meeting in Pittsburgh October 2-5, and Dr. Charles H. Henninger, Pittsburgh, was installed as president. Vice presidents elected were Drs. Charles G. Eicher, McKees Rocks; Ward O. Wilson, Clearfield; Walter J. Stein, Ardmore, and John J. Sweeney, Highland Park. Dr. Walter F. Donaldson, Pittsburgh, was reelected secretary. The 1940 session will be held in Philadelphia.

Philadelphia

Symposium on Pneumonia.—The Philadelphia County Medical Society held a meeting October 11 devoted to the subject pneumonia. Dr. Wheelan D. Sutliff, assistant director, pneumonia control division, bureau of laboratories, New York City Department of Health, spoke on "Application of Pneumococcus Bacteriology and Immunity to the Prevention and Cure of Pneumonia." Drs. John J. Shaw, state secretary of health, and Dale Cook Stahle of the health department staff, Harrisburg, discussed "Pneumonia—the Problem in Pennsylvania"; Charles L. Brown, etiology and diagnosis; Harrison F. Flippin, chemotherapy, and Henry A. Holle, U. S. Public Health Service, pneumonia as a national problem.

Pittsburgh

Annual Lecture on Diabetes.—The Renziehausen Memorial Lecture, established in 1937 for the advancement of knowledge of diabetes, will be delivered November 13 at Mellon Institute by Dr. Howard F. Root, Boston, on "Complications of Diabetes Mellitus."

Society News.—At a meeting of the Allegheny County Medical Society October 17 the speakers were Drs. John W. Stevenson on "Bicornate Uterus Associated with Pregnancy"; Joseph W. Hampsey, "Masking of Clinical Picture of Acute Mastoiditis During the Administration of Sulfanilamide," and Alfred B. Sigmund, Bridgeville, Pa., "Suppurative Appendicitis and Its Treatment with Alcohol."—Drs. John H. L. Heintzelman and James A. Cowan Jr. addressed the Pittsburgh Academy of Medicine October 10 on "Use of Ethyl Iodide in Chronic Nontuberculous Pulmonary Disorders" and "Delayed Flap in the Repair of Surface Defects" respectively.

WASHINGTON

State Medical Election.—Dr. Homer D. Dudley, Seattle, was named president-elect of the Washington State Medical Association at the annual meeting in August and Dr. Warren B. Penney, Tacoma, was installed as president. Dr. James G. Matthews, Spokane, was elected vice president and Dr. Vernon W. Spickard, Seattle, was reelected secretary. The 1940 meeting will be in Tacoma.

WISCONSIN

State Society Award to Dr. Johnson.—The State Medical Society of Wisconsin presented its fifteenth annual Council Award to Dr. Fred G. Johnson, Iron River, at the annual session in Milwaukee in September. In his citation Dr. Stephen E. Gavin, Fond du Lac, chairman of the council, observed that Dr. Johnson has been for thirty-nine years a family physician serving a scattered population over a large area. His services to medicine, as cited by Dr. Gavin, include having been twice president of a county medical society, president of the district medical society, nine years a counselor of the state society, seven years a preceptor of the University of Wisconsin Medical School and a collaborator in establishing and conducting the first tuberculosis sanatorium in Wisconsin. Dr. Johnson was born in 1872 and graduated from Rush Medical College, Chicago, in 1900.

HAWAII

New Director of Mental Hygiene.—Dr. Edwin E. McNiel, Honolulu, has been appointed director of the bureau of mental hygiene and in charge of the mental hygiene clinic under the board of health of Hawaii.

PHILIPPINE ISLANDS

Meeting at Canacao Hospital.—The U. S. Naval Hospital at Canacao entertained the senior class and the faculty of the University of the Philippines College of Medicine August 14. Papers were presented by Lieut. Alton C. Abernethy, Cavite, on "Lymphogranuloma Venereum" and Lieut. Comdr. Charles F. Flower, Cavite, "Fracture Dressings." Capt. Joseph J. A. McMullin and the hospital staff were hosts. Captain McMullin is assistant adjunct professor of surgery at the medical school in Manila.

GENERAL

Fellowships for Cancer Research Available.—The Finney-Howell Research Foundation, Inc., announces that all applications for fellowships for next year must be filed in the office of the foundation by Jan. 1, 1940. Applications received after that date cannot be considered for 1940 awards, which will be made the first of March. Fellowships carrying an annual stipend of \$2,000 are awarded for the period of one year with the possibility of renewal up to three years; when deemed wise by the board of directors, special grants of limited sums may be made to support the work carried on under a fellowship. Additional information may be obtained from the foundation, 1211 Cathedral Street, Baltimore.

Air Hygiene Meeting.—The fourth annual meeting of the Air Hygiene Foundation will be held at the Mellon Institute, Pittsburgh, November 14-15. Among features of the program will be a symposium on absenteeism in industry with Dr. Anthony J. Lanza, New York, presiding; a forum designed to show that "Industrial Health Pays Double Dividends"; reports on the foundation's engineering research at Harvard University by Philip Drinker, Ch.E., Boston; reports of medical research at Saranac Lake, N. Y., by Dr. Leroy U. Gardner,

and at the University of Pennsylvania by Drs. Eugene P. Pendergrass and Eliot R. Clark, Philadelphia. About 200 industrial firms are affiliated with the foundation.

Dermatologists to Meet in Philadelphia.—The second annual meeting of the American Academy of Dermatology and Syphilology will be held at the Bellevue-Stratford Hotel, Philadelphia, November 6-8. The sessions will consist of symposiums, courses lasting from one to four hours and round table discussions. Dr. Cornelius P. Rhoads, New York, will be the guest speaker Monday November 6 on "Vitamin B Complex." Tuesday will be devoted to clinical presentations at Jefferson Medical College of Philadelphia. There will be symposiums on syphilis, allergy, pharmaceutical therapeutics, physiology and chemistry of the skin. Dr. Paul A. O'Leary, Rochester, Minn., is president and Dr. Earl D. Osborne, Buffalo, secretary of the academy.

Special Society Election.—Dr. Frank R. Spencer, Boulder, Colo., was named president-elect of the American Academy of Ophthalmology and Otolaryngology at the annual session in Chicago October 8-13. Dr. Spencer will succeed Dr. Frank E. Brawley, Chicago, who becomes president January 1. Vice presidents elected were Drs. Arthur W. Proetz, St. Louis; Joseph F. Duane, Peoria, Ill., and Charles T. Porter, Boston. Dr. William P. Wherry, Omaha, was reelected executive secretary and Dr. Erling W. Hansen, Minneapolis, was made secretary for public relations, succeeding Dr. Ralph A. Fenton, Portland, Ore., resigned. The academy voted to sponsor a new venture in graduate medical education. Plans were made for the establishment of reading courses for hospital residents and interns planning to specialize in ophthalmology and otolaryngology.

Changes in Status of Licensure.—The California State Board of Medical Examiners reported the following actions taken at its regular meeting July 10-13:

Dr. Sharon M. Atkins, Los Angeles, license restored and placed on probation for five years.
Dr. Woodward B. Mayo, Burbank, Calif., certificate restored and placed on probation for five years.
Dr. Harold E. Morrison, Morro Bay, Calif., certificate restored.
Dr. Jesse C. Ross, Los Angeles, license restored.
Dr. Shunah Milton Mann, National City, Calif., license revoked July 13 following charges of "aiding and abetting" and of illegal operation.
Dr. Virgil J. McCombs, Los Angeles, license revoked following charges of alleged use of fictitious name and "aiding and abetting."
Dr. James T. Murray, Los Angeles, license revoked on charges of alleged narcotic addiction.
Dr. Walter M. Thorne, Fresno, Calif., license revoked on a charge of alleged narcotic addiction.
Dr. Donaciano Trevino, San Bernardino, Calif., license revoked following his conviction of violation of the Harrison Narcotic Act.
Dr. James Cushing Weld, Los Angeles, license revoked following charges of "aiding and abetting" and the use of a fictitious name.
Dr. Orel Alvin Welsh, Ventura, Calif., license revoked following his conviction on charges of performing an alleged illegal operation.

The New York State Board of Medical Examiners recently reported the following action:

Dr. Charles I. Gordon, formerly of Brooklyn, license revoked June 16.
The Virginia State Board of Medical Examiners announces the following:

Dr. J. Burton Nowlin, Lynchburg, Va., license reinstated June 21.

More Swindlers.—A man named George W. Remick, who often calls himself Dr. Remick, recently represented himself as a salesman for laboratory equipment firms and without authority has collected accounts owed to these firms. He has been traveling in California, Arizona, Texas, Colorado and New Mexico, posing as a salesman for the Jones Metabolism Equipment Company of Chicago and the Bristow Company of Los Angeles, among others. It is said that Remick approached a laboratory in El Paso, Texas, with the story that he had an option on some laboratory equipment which was being returned from China. Remick informed the laboratory physician that this apparatus was held by the customs office for fees which would have to be paid before it could be released and induced the doctor to give him a check to be paid to the customs office. Nothing further was heard from Remick and the customs office knew nothing of the occurrence. Remick is about 43 years old, about 5 feet 9 inches tall, weighs 190 pounds, has a fair complexion, light sandy hair with slight baldness and blue eyes. He is said to be talkative, late to appointments, fond of flashy clothes, usually with unmatched coat and trousers.—Further information has been furnished by the Chicago Better Business Bureau concerning a man who claimed to represent the "Hayes Company" of Indianapolis, reported in THE JOURNAL October 7, page 1423. The Indianapolis Better Business Bureau reported that several complaints had been received about this man, all from the Chicago area, and that no firm of Hayes and Company could be located in Indianapolis. The man appeared to be about 55 years old, 5 feet 8 inches tall and weighed about 140 pounds, it is reported. He claimed that he had bought

out a surgical supply house in Indianapolis for "almost nothing" and wanted to sell as much as possible so that he would not have to move much stock to Chicago, where he intended to start a business.

CANADA

Balfour Lecture at Toronto.—The fourteenth annual lecture under the Donald C. Balfour Lectureship in Surgery of the University of Toronto Faculty of Medicine, Toronto, was delivered October 11 by Prof. George Grey Turner, London, England, on "Transplantation of the Ureters."

Society News.—Dr. William E. Campbell, Winnipeg, was elected president of the Manitoba Medical Association at the annual meeting in September. Drs. Edward D. Hudson, Hamiota, and Hubert D. Kitchen, Winnipeg, were elected vice presidents and Dr. Clarence W. MacCharles, Winnipeg, secretary.

CORRECTION

Sigmund Freud's Age.—THE JOURNAL, October 14, page 1494, stated that Sigmund Freud died Sept. 22, 1939, in his eighty-third year. Dr. Freud was born May 6, 1856, and was therefore at the time of his death in his eighty-fourth year. Dr. Freud died about 3 a. m. September 23, London time, which would place his death before midnight New York time and, thus figured, would make the date of death there September 22.

Government Services

Increase in Salary for CCC Physicians

Since the receipt in this office of the item entitled, "Physicians Wanted for the CCC," published in THE JOURNAL, October 14, page 1500, the office of the surgeon of the Eighth Corps Area, Fort Sam Houston, Texas, has received instructions from the War Department to the effect that the salaries of all physicians on duty with the CCC would be \$3,200 per year instead of \$2,600 per year.

New Manager of Veterans Hospital

Dr. Grover C. Daniel, clinical director of the Veterans Administration Facility, Walla Walla, Wash., has been appointed manager effective October 1. He had been acting manager since the recent death of Dr. Orville D. Wescott, manager. Dr. Daniel was born in Olinville, Ky. He served in the army medical department from September 1917 until December 1918, and the following year graduated at Loyola University School of Medicine, Chicago.

Examinations for Government Positions

The U. S. Civil Service Commission announces open competitive examinations for the following positions: senior medical officer with a salary of \$4,600 a year; medical officer, \$3,800; associate medical officer, \$3,200. Applicants for the grade of senior medical officer must qualify in aviation medicine, cardiology or cancer research; for the other positions applicants may choose among fourteen optional branches. The registers resulting from these examinations will be used for filling vacancies in the U. S. Public Health Service, the Veterans' Administration, the Indian Service and the Civil Aeronautics Authority. Applicants must have graduated from recognized medical schools. Those applying for the position of senior medical officer must not have passed the fifty-third birthday; those for medical officer the forty-fifth and those for associate medical officer the fortieth. Dates for filing applications are as follows: November 13 if received from states other than those in the Far West as listed; November 16 if from Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming; March 11, 1940, if from points in Alaska south of the Arctic Circle; May 13, 1940, if from points in Alaska north of the Arctic Circle. Application forms may be obtained from the secretary of the Board of Civil Service Examiners at any first class post office, from the U. S. Civil Service Commission, Washington, D. C., or from the U. S. Civil Service district office in any of these cities: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, Balboa Heights, Canal Zone, and San Juan, Puerto Rico.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 30, 1939.

London Hospitals in Wartime

In previous letters it has been stated that, for the treatment of the numerous civilian casualties expected from air raids, London has been divided into ten sectors radiating from the center. The great hospitals are situated at the apexes of the sectors and become casualty clearing stations, while at the periphery, that is in the country, are the "base hospitals" to which the casualties will be evacuated for greater safety. The latter are hospitals or institutions which have been converted to this use. A description of the largest one, situated at some distance from London, illustrates typically the gigantic preparations which have been made. The hospital normally accommodated 2,200 mental patients, who were transferred to other institutions, but the malarial unit for the treatment of dementia paralytica was maintained, so that it would be available for the treatment of neurosyphilis. As the advanced base hospital for St. Thomas's and King's College hospitals it provides 2,560 beds. The big day room has been converted into three operating rooms, each with two tables, and there are smaller operating rooms elsewhere. Adjoining the operating rooms are resuscitation rooms, each with about twenty beds, for which a team has been trained. The former entertainment hall is a Red Cross dispensary.

For the treatment of the civilian casualties the hospital has been divided into five units, which to facilitate direction have been given different color schemes. Four of these units deal entirely with the care of the sick and wounded. Each is controlled by a surgeon on the staff of King's College Hospital, and his staff consists of three surgeons, one physician, two anesthetists and a number of medical officers. The fifth unit deals with the reception and distribution of cases and is in charge of a physician of King's College Hospital. Each of the four treatment units will have one "take-in" day out of every four and will receive the bulk of the admissions on that day, though the other units will also be admitting, particularly to the wards earmarked for specialist treatment.

The surgeon in charge of the unit organizes the whole of the work and himself operates as he deems necessary. He reports to the medical superintendent and to the physician and surgeon respectively in charge of the medical and surgical division. The local medical practitioners will also be employed for sessions of two and one-half hours daily. The nurses attached number 700 and have been drafted from London hospitals. Medical students from the London hospitals have been received and a considerable amount of instruction, including lectures, is given. It deals with the kind of cases expected: injuries of the head, chest and abdomen, fractures, burns, wound infections, gas casualties and war neuroses. Even a perambulating museum, which goes in turn to the three hospitals of the sector, has been arranged. This vast disorganization of the peacetime medical service and reorganization of it into a wartime service has been accomplished with celerity and efficiency.

Almost all the London consultants have been mobilized or are on call, and most of them have ceased all other work. But, as seems almost inevitable under the improvised conditions of war, the rates of remuneration have been too crudely laid down. The younger men suddenly find themselves with incomes they could not have expected for years, but the older established ones, with heavy financial obligations, sometimes

are faced with bankruptcy. A plan has been prepared to allow senior men who wish to resume private work to exchange their full time work for part time, so that they can continue their private work.

Prof. G. R. Murray Is Dead

Dr. George Redmayne Murray, emeritus professor of medicine in Victoria University, Manchester, and the discoverer of the thyroid treatment of myxedema, has died. Educated at Cambridge, he graduated with first class honors in the Natural Science Tripos in 1886. He then went to University College Hospital, London, where he had a brilliant career. In 1891 he was appointed pathologist to the Hospital for Sick Children, Newcastle-upon-Tyne, and lecturer in bacteriology, Durham University College of Medicine. He made a great reputation as a teacher and in 1893 was appointed professor of comparative pathology. In 1908 he migrated to Manchester, where he became professor of medicine. His case, which is classic, was published in 1920 in the *British Medical Journal* under the title "The Life History of the First Case of Myxedema Treated by Thyroid Extract."

PARIS

(From Our Regular Correspondent)

Sept. 20, 1939.

Medical Activities of the War

The general opinion of French medical circles is that present war conditions ought not to interrupt the scientific labors of the nation. The limitations placed on medical research by the mobilization of scientific investigators and their assistants and by the curtailment of means of action and work are perhaps partially compensated by the study of special problems caused by the war. Accordingly, all necessary measures have been taken for the continuation of medical activities. The large medical reviews will reduce their editions by about half, either appearing once in every two times or by combining two issues into one. The numerous meetings which were to be held during the autumn have been postponed. However, the large medical societies such as the Société médicale des hôpitaux de Paris, the Société de médecine de Paris and the Société des chirurgiens de Paris have decided to meet as usual; some have even anticipated their regular date. The Académie de médecine met September 12. Instead of the few members usually present the attendance was almost complete. Not only the small body that "holds the fort" during the vacations was present but all who happened to be in Paris came spontaneously, glad to meet one another in these grave times. Many of the academic staff were in uniform, either already assigned to military duties or mobilized in the hospitals with which they are associated. Some of those absent had already been called to the front. Those past the age of military service have for the most part been assigned to special centers.

War increases the number of cases of certain rare maladies. It brings about an increase of wounded with numerous practical problems. It is well known what progress in surgery resulted from the vast clinical experiences of the World War. For that reason the Académie de chirurgie has likewise decided to resume its meetings. Specialized medical centers will be organized, such as the cardiology, psychiatric, tuberculous, syphiligraphic, tropical diseases and neurosurgery. The heads of these centers have not been publicly named, but it is easy to guess them by noting simply the most competent men in each specialty. The functions of these centers will be manifold. They will have to take care of patients who fall within their specialty and seek methods of treatment best adapted to war diseases. Once cured, these patients will be rehabilitated. It will be necessary to determine their exact status and the extent to which participation in military service caused or aggravated their disease, to fix their degree of invalidism—

that is to say, the pension to which they will be entitled—to follow up the rehabilitated and to prepare their readjustment to civil life so that they may be least burdensome to their community. In short, these specialized centers will at the same time be centers of instruction for the physicians at the front and for the students who pursue their studies in uniform.

Scientific Meetings

Hédon and Loubatières pointed out before the Académie des sciences that the quantities of hydrochloric acid exhaled and those of oxygen utilized were normal or even somewhat below normal, tested out in the type of experimental diabetes discovered by Young and determined in the dog by repeated injections of hypophysial extract (anterior lobe) in the peritoneal cavity. These quantities correspond to an expenditure of energy less than 2.5 kilocalories an hour. Young's experimental diabetes differs, accordingly, from the one determined after complete extirpation of the pancreas by the absence of a rise in the basal metabolism. There is also a connection between certain organic disorders, particularly of the central nervous system, noted in those who occupy buildings made of reinforced cement. The metal framework of these buildings constitutes a veritable box such as Faraday used in one of his experiments and creates a constant vibration with the alternating currents, as Denier demonstrated before the Société française d'électrologie et de radiologie.

Lian and his collaborators before the Société française d'hématologie presented an optical method of exploring the coagulation of the blood, based on modifications of the optical density of the plasma in the course of its change from fibrinogen to fibrin. The results are recorded by means of a graph of a particular form which indicates the duration, the beginning and the quality of the coagulation.

BERLIN

(From Our Regular Correspondent)

Sept. 6, 1939.

Reorganization of Studies in Chemistry

In the reconstruction of the medical curriculum, the reorganization of the curriculum of chemical studies has been ordered. To provide uniform training in chemistry, an association had been formed already before the World War by the chemical institutes of the universities to conduct examinations and issue certificates. This preliminary examination had to be passed before one could proceed to work on the doctoral thesis. Formerly, no final examination outside the doctoral thesis existed, certifying that the student had completed a chemical program of comprehensive studies. One could call oneself a chemist without having had a thorough training. Now, however, chemical studies have been given uniformity. No definite course of studies is prescribed for the required seven semesters. The determining factor is the degree of thoroughness, the attainment of which depends solely on the aptitude and industry of the student. The gifted student may thus complete his studies within a shorter time than the prescribed period. Success in passing the examination conferring the chemical diploma opens the way for the doctoral candidacy. The new curriculum of chemical studies divides the student's training into two sections: (1) four semesters of inorganic, organic, physical and physicochemical studies culminating in a "preliminary" examination with diploma and (2) three semesters of "deepened training." In this second phase the student is required to select his major study whether in inorganic, organic, general or technical chemistry. It is based on the assumption that the complexity of chemical studies no longer permits uniform attainments in all the branches of chemistry. This specialized training is attested at its conclusion by a preliminary thesis leading to the diploma and is the pre-

quisite for admission to the main examination. Choice of thesis material should be made with a view of continuing it for the doctor's degree. The "chemist with a diploma" is now a new recognized academic degree.

Control of Malignant Tumors in Danzig

Through regulation of the Danzig senate "a labor association for combating malignant tumors" has been organized. This association is to establish principles for educating the population on the prophylactic examinations to be taken at certain intervals, especially by women, on the kinds of examinations and the treatment of those afflicted. Treatment of malignant tumors may be performed only by physicians. Treatment by mail as well as advice offered on how to cure oneself by means of lectures, pamphlets and so on is prohibited. Physicians are required to conform strictly to the principles established by the labor association. Physicians, public health officials and hospitals must officially report all cases of malignant tumors and suspected tumors within six days. Violations are punishable by fines. Every woman 30 years of age and every man 45 years of age may have themselves examined once a year at the expense of the labor association, which in turn is reimbursed by insurance companies.

ITALY

(From Our Regular Correspondent)

Sept. 15, 1939.

Renal Tumors

The Accademia di Scienze Mediche of the Coneglio and Vittorio regions at a recent meeting discussed renal tumors. Professor Bortolozzi discussed the incidence of renal tumors. He showed a preference for Pugliotti's classification, which is a modification of that of Busser and Obersimmer and is based on morphologic histology. Professor De Gironcoli discussed the symptoms, diagnosis and treatment of renal cancer. Professor Opocher called attention to the importance of urologic disorders for gynecologists. There are so many anatomic, embryologic and physiopathologic interferences between the urinary tract and the female internal genital organs that the conception on the existence of a urologic branch of gynecology is justified. The speaker discussed pyelitis and hydronephrosis in pregnancy, and the reciprocal influence between pregnancy and renal cancer, the coexistence of renal tumors with those of the uterus or of the ovary, vaginal substances from renal carcinoma, metastases to the kidney from chorionepithelioma of the uterus and the possible changes of sexual characters from adrenal tumors.

Renal Complications from Blood Transfusions

Professor Papa, of Naples, in a reunion of the Società Napoletana di Chirurgia, which was held recently, reported results of clinical and experimental work on the behavior of renal functions in blood transfusion which he carried on. He studied the variations of azotemia, the elimination of urea and amino acids through the urine and the possible appearance in the urine of substances which could indicate pathologic involvement after blood transfusion with compatible blood. A patient who had repeated transfusions died from acute renal insufficiency. The speaker found by experiments that the alterations of the renal functions which develop from repeated blood transfusion are due to renal alterations which can be seen during microscopic studies on the kidney. The syndrome which is due to renal blockage may develop suddenly or progressively. The acute syndrome probably develops from spasm of the renal arteries. The chronic syndrome probably develops from a reaction of the kidney to toxic substances which cause alterations of the tubuli and of the glomeruli of the structure.

History of Forceps

Professor Gall of Trieste recently reviewed before the Associazione Medica di Trieste the history of forceps, which were invented by obstetricians of the Chamberlen family, which family used them only when they could obtain large amounts of money from a patient. Roonhuysen, an obstetrician from the Netherlands, bought the instrument from Ugo Chamberlen also with a mercenary purpose. Later Chamberlen bought it back from Roonhuysen. Mauriceau, a Parisian obstetrician, was accused in the poem called "Luciniade" of having retarded the use of forceps in France, but the accusation was false.

Policy of Authorities on Sanitation

The under secretary of state of internal affairs recently lectured before a meeting of the house of representatives. He said that improvement of the race depends on sanitation, the problems of which cannot be solved by bureaucratic centers but by the combined work of large groups of technicians and physicians, especially municipal physicians who are well informed on the problems of local public health. The members of the ministry of internal affairs resolved to elevate the educational and technical standards of officers of public health who work in the various branches of social medicine, especially municipal physicians who are concerned with the prevention and control of diseases. The educational standards of midwives have been elevated also. Administration of antidiphtheric vaccination is compulsory.

Promotion of Assistant University Teachers

The head of the Public Education centers requested from the members of the national board of public education the framing of a bill which concerns assistant teachers in universities. The bill was approved. It provides that assistant teachers in universities who entered by winning a contest or else those who have worked satisfactorily for five years can be either promoted to the position of regular professors in colleges or may be appointed to technical positions in offices of the government.

STOCKHOLM

(From a Special Correspondent)

Sept. 26, 1939.

Artificial Sunlight for Miners

What is certainly unique in Sweden, and probably in the whole of Scandinavia, is a solarium which has been provided by the proprietors of the Boliden mine, whose underground workers can enjoy daylight only on Sundays and for a short daily meal interval from the middle of September to the middle of March. Dr. Johan Pontén, who has played an important part in connection with this solarium, has recently issued a report on its action since it was started in December 1937. The room in which four large quartz lamps and four "solux" lamps were installed measured 5 by 6 meters and was kept at a temperature of from 25 to 30 C. (77 to 86 F.). After changing their clothing and taking a douche or bath, the men would sit naked in the solarium for three minutes every other day, their eyes protected by special glasses.

Wishing to obtain objective and reliable data concerning the effects of such infra-red and ultraviolet radiation on the miners, Dr. Pontén carried out calcium and phosphorus analyses of the blood on twenty-two healthy miners between the ages of 23 and 47. He found an appreciable rise in the average calcium content of the serum from 9.9 mg. per hundred cubic centimeters before the solarium was opened to 10.5 mg. in March 1938, after the solarium had been in use for three months. Another line of research was to compare the morbidity rates among the workers in the Boliden mine before and after the provision of the solarium. Among the 175 underground workers the sickness rate was 9.7 days per head in 1937 and 8.5 in 1938. In the same period there was a reduc-

tion by 12 per cent in the frequency of "one day diseases" and a reduction by 43 per cent of the catarrhal diseases of the respiratory tract. A questionnaire to which anonymous answers were invited showed that a large proportion of the men considered themselves fitter in many respects since they had enjoyed the benefits of the solarium.

Research on Pellagra

The conviction that pellagra can be considered a foreign disease with no practical interest for Swedes has given place to a suspicion that pellagra may be quite common in mental hospitals. At the Beckomberga Mental Hospital, under the direction of Dr. S. Wohlfahrt, five well defined cases of pellagra have been observed in the course of two years. As for the number of early or abortive forms of this disease, accurate information is lacking, for early pellagra presents such vague signs and symptoms that its distinction from a host of other ill defined ailments is most difficult.

Dr. Erland Mindus, who has for some time paid special attention to a twenty-six bed department for women patients in the Beckomberga Hospital, has recently set himself the task of systematically examining all new cases admitted to this hospital for signs of defective gastric activities. He has supplemented test meals with feces examinations and radiologic examinations, and he has found achylia or hypochylia in about 91 per cent of the women patients recently admitted to the hospital. To test his hypothesis that many of these patients with defective gastric secretion were suffering from the beginnings of pellagra, he divided them into two groups as similar as he could make them, and in both the clinical picture was stamped by lassitude, anorexia, depression, loss of weight, simple anemia, insomnia, amenorrhea, hypesthesia, muscular weakness, restlessness and anxiety or apathy. In other words, the clinical picture was that commonly associated with the term "gastrogenic neurasthenia." The first group was given treatment as for pellagra, a stomach extract with hydrochloric acid, extra rations of meat and eggs and, in some cases, vitamin B preparations. The second group, which served as a control, was given the routine treatment heretofore in vogue for such cases in this hospital. The comparatively satisfactory response of the patients in the first group to the special treatment given them suggests that many, if not most, of them may have been suffering from pellagra in a stage too early for the development of the characteristic cutaneous changes.

The Centenary of Ling, the Father of Swedish Gymnastics

On May 3, 1839, the death occurred of Petter Henrik Ling at the age of 63. He was then at the head of the Central Gymnastic Institute, honored at home and abroad. The son of a poor clergyman, he lost his father at the age of 2 and was brought up in most humble circumstances. He graduated at the University of Lund and continued to study in Uppsala. But he never qualified as a doctor. His gifts as a poet and author were full of promise, but it was in gymnastics that he earned a place in the history of medicine. During the century which has passed since his death there have been countless developments in gymnastics, yet the principles he laid down are held to be as sound today as they were when his forceful personality was behind them. The Central Gymnastic Institute, which he founded, has remained ever since as a school for the teaching of gymnastics in health and disease and it has maintained that high standard which has placed Swedish gymnastics in so prominent a position in the world. He made gymnastics a national movement which, beginning in the schools and soldiers' camps, came to inspire the whole community. Throughout Sweden this year Ling's memory is being paid tribute to, and it is no mere chance that the Swedish govern-

ment is opening this year an institution for the teaching of the physiology and hygiene of bodily exercises.

At first, the public was inclined to jeer at a man fanatically devoted to the light he followed. But the medical profession took him and his cause seriously, and the Swedish Medical Society honored itself by electing him a member in 1831. He seems to have been as frail of body as he was forceful of spirit. As a young man he was told by his doctor that he was suffering from consumption. After his death the examination proved this diagnosis to have been correct and showed that death was due to malignant disease of the liver. He was subject to violent attacks of coughing and his respiration was labored, but the vitality of his spirit dominated the frailty of his body throughout his life.

Marriages

FRANK M. WARDER, Glasgow, Ky., to Miss Irene Katherine Randolph of Detroit Lakes, Minn., in Rushville, Ind., August 11.

WARREN A. SMITH, Berrien Springs, Mich., to Mrs. Ruth Cameron of Kalamazoo, in South Bend, Ind., in August.

ROBERT GARFIELD RICKERT, Ann Arbor, Mich., to Miss Miriam Irene McCausey of Highland Park, August 22.

ALEXANDER H. SNEDDON to Mrs. Wilma McLaughlin Dugan, both of Cambridge, Ohio, in New York, August 18.

HOWARD PLEAS WHEELER, Georgetown, Texas, to Miss Mary Josephine Davidson of Fort Worth, August 17.

STAMATIS GEORGE VELONIS, Nespelem, Wash., to Miss Helma Stuart Ross at Northampton, Mass., July 8.

HUGH ALFRED WATSON, Queens Village, N. Y., to Miss Almeria Russ at Hendersonville, N. C., July 28.

JOHN KENT FINLEY, Philadelphia, to Miss Margaret Sheehan Gindhart of Ventnor, N. J., September 6.

GEORGE W. SMELTZ, Pittsburgh, to Miss Callie Waldran of Washington, D. C., in Baltimore, August 2.

ALBERT J. TANNY to Miss Rose McDermott, both of Albuquerque, N. M., at Santa Fe, September 5.

JOHN HOGE WOOLWINE JR., Blacksburg, Va., to Miss Frances Wellons of South Roanoke, September 2.

JOHN I. RINNE JR., Anderson, Ind., to Miss Madge Goldman of Marengo, at Seymour, August 31.

GEORGE KENNETH SCHOLL to Miss Dorothy Ophelia Rhea, both of Johnson City, Tenn., August 25.

HARRY ORR VEACH, Los Angeles, to Miss Pauline Manchester of South Pasadena, August 13.

TERENCE ALOYSIUS KEMPF, Omaha, to Miss Frances Anne Rochford of Colon, Neb., August 26.

CARROLL B. SHADDOCK JR., Beaumont, Texas, to Miss Hulda Martha Gaertner of Malone, July 22.

CHARLES H. MOSELY JR., Monroe, La., to Miss Florent Jane Morley of Rayville, August 5.

WILLIAM C. SPRING JR., Glen Ridge, N. J., to Miss Louell Clark of Jefferson, Ohio, in August.

RUSSELL B. WILLIAMS, Downsville, N. Y., to Miss Auvra May Keith of Salem, Va., July 27.

RALPH N. REDMOND, Sterling, Ill., to Miss Katherine Baxte of Cedar Rapids, Iowa, August 1.

FREDERICK J. GRABER, Stockport, Iowa, to Mrs. Gladys B. Hiatt of Toledo, September 2.

CHARLES FREDERIC STONE JR. to Miss Hazel Hart Smith both of Boston, in September.

WILLIAM CURTIS STIFLER JR. to Dr. JEAN EVANS ROSE both of Baltimore, July 29.

HERBERT KAPLAN, Collegeville, Pa., to Miss Cora Petermar of Limcrick, October 7.

BERNARD P. WOLFF, Atlanta, Ga., to Miss Douschka Brown of Marietta, August 3.

ELLIS K. VAUBEL, Dysart, Iowa, to Miss Helen Christenson of Royal, August 18.

PHILIP ROCHE to Miss Susan Foulke Yocom, both of Philadelphia, August 7.

Deaths

Albert Coulson Buckley * Philadelphia; Medico-Chirurgical College of Philadelphia, 1897; professor of psychiatry, University of Pennsylvania School of Medicine and the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; associate professor of normal histology at his alma mater, 1899-1908, and associate professor of psychiatry, 1908-1917; member of the American Neurological Association, American Psychiatric Association and the Association for Research in Nervous and Mental Disease; past president of the Philadelphia Psychiatric Association; medical superintendent of the Friends Hospital; served in various capacities on the staffs of the Philadelphia General Hospital and the Philadelphia Orthopedic Hospital; author of "Nursing Mental and Nervous Diseases"; aged 66; died, August 17, of pneumonia.

Ernest Charles Dickson * San Francisco; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1906; professor of public health and preventive medicine, emeritus, Stanford University School of Medicine, assistant professor of pathology, 1910-1913, assistant professor of medicine, 1913-1918, associate professor of medicine, 1918-1923, professor of medicine, 1923-1926, and later professor of public health and preventive medicine; instructor of pathology and bacteriology, Cooper Medical College, 1908-1910; member of the Association of American Physicians; on the staff of the Stanford University Hospitals; aged 58; died, August 23, of cerebral hemorrhage.

Louis Daniel Englerth * Philadelphia; Jefferson Medical College of Philadelphia, 1914; F.R.C.S., Edinburgh, Scotland, 1919; fellow of the American College of Surgeons; served during the World War; formerly assistant demonstrator of clinical surgery at his alma mater; surgeon to the Frankford, Philadelphia General, and St. Joseph's hospitals and North-eastern Hospital of Philadelphia; consulting surgeon to the Grandview Hospital, Sellersville; aged 50; died, August 16, in the Jefferson Hospital of hypertensive cardiovascular disease.

Frank Henry Hagaman * Jackson, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1918; president of the Central Medical Society; member of the Southern Surgical Association and the Southeastern Surgical Congress; fellow of the American College of Surgeons; served during the World War; on the staffs of the Mississippi State Tuberculosis Sanatorium, Sanatorium, and the Mississippi State Charity and the Mississippi Baptist hospitals; aged 43; died, August 19, of injuries received in an automobile accident.

Willis Ellis Hartshorn * New Haven, Conn.; University of Minnesota Medical School, Minneapolis, 1898; clinical professor of surgery, Yale University School of Medicine; member of the New England Surgical Society; fellow of the American College of Surgeons; attending surgeon to the New Haven Hospital; consulting surgeon to the Griffin Hospital, Derby, Grace Hospital, New Haven, and chief of staff of the surgical clinic, New Haven Dispensary; aged 67; died, August 4.

Joseph Francis Ward, Brooklyn; Baltimore University School of Medicine, 1899; served during the World War; past president of the Brooklyn Society of Internal Medicine; for many years a member of the board of managers and also consulting physician and psychiatrist of the Craig Colony, Sonyea; formerly chief of the diagnostic research laboratory of the Victory Memorial Hospital; aged 67; died, August 10.

Andrew Martin Gillen, Brooklyn; Long Island College Hospital, Brooklyn, 1897; member of the Medical Society of the State of New York; honorary surgeon in the police department; chairman of the medical board and chief obstetrician at the Shore Road Hospital; on the staff of the Hospital of the Holy Family and St. Mary's Hospital; aged 64; died, August 15, in the Long Island College Hospital.

William Chester Billings * Medical Director, U. S. Public Health Service, retired, La Canada, Calif.; Harvard Medical School, Boston, 1894; was commissioned an assistant surgeon in the U. S. Public Health Service, Dec. 28, 1898, and was retired as a medical director, Oct. 1, 1933; aged 67; died, August 16.

Flaviano E. Parodi, New York; Regia Università degli Studi di Genova Facoltà di Medicina e Chirurgia, Italy, 1891; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; visiting surgeon to the Columbus Hospital; died, August 23, in the Mount Sinai Hospital.

Hugh Francis Flaherty, Hartford, Conn.; Yale University School of Medicine, New Haven, 1907; member of the Connecticut State Medical Society; past president of the board of health; aged 59; on the staff of St. Francis Hospital, where he died, August 24, of arteriosclerosis and chronic nephritis.

Alice Zelia Patterson-Murphy, Flushing, N. Y.; Boston University School of Medicine, 1896; formerly adjunct professor of anatomy at the New York Medical College and Hospital for Women, New York; aged 64; died, August 21, in Newton Highlands, Mass., of brain tumor.

James L. Shuler * Durant, Okla.; Arkansas Industrial University Medical Department, Little Rock, 1887; secretary and past president of the Bryan County Medical Society; medical director of the Bryan County Hospital; aged 79; died, August 24, in Hobbs, N. M., of chronic nephrosis.

Theodore Chamberlin, Concord, Mass.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; formerly district medical examiner and consulting physician to the Middlesex School and the Concord Reformatory; aged 71; died, August 8.

Jackson Joseph Ayo * Jackson, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1893; superintendent of the East Louisiana State Hospital; member of the state board of medical examiners; for many years parish coroner; aged 70; died, August 18.

Charles Prevost Grayson * Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1881; emeritus professor of laryngology at his alma mater; member of the American Laryngological Association; aged 79; died, August 16, of cirrhosis of the liver.

Ellis Henry Milton, Mount Eden, Ky.; Hospital College of Medicine, Louisville, 1892; Southwestern Homeopathic Medical College and Hospital, Louisville, 1898; aged 74; died, July 17, in the King's Daughters Hospital, Shelbyville, of an abdominal malignant condition.

Floyd Ashley Thomas, Flemington, N. J.; Medico-Chirurgical College of Philadelphia, 1907; member of the Medical Society of New Jersey; served during the World War; member of the board of health; aged 57; died, August 9, of coronary thrombosis.

Frank Jackman Sherman * Ballston Spa, N. Y.; University of Vermont College of Medicine, Burlington, 1880; for many years health officer; aged 80; on the staff of the Benedict Memorial Hospital, where he died, August 25, of coronary sclerosis.

Henry Sprince * Lewiston, Maine; McGill University, Faculty of Medicine, Montreal, Que., Canada, 1923; served during the World War; aged 41; on the staff of the Central Maine General Hospital, where he died, August 4, of sarcoma of the sacrum.

Fred Barrington Sutherland, Wolfeboro, N. H.; Cooper Medical College, San Francisco, 1892; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; aged 70; died, August 11, of cerebral hemorrhage.

Nathan Easterly Hartsook * Johnson City, Tenn.; Medical College of Virginia, Richmond, 1895; past president of the Washington County Medical Society; on the staff of the Appalachian Hospital; aged 70; died, August 10, of coronary thrombosis.

Charles William Courville, Detroit; Detroit College of Medicine, 1906; member of the Michigan State Medical Society; diagnostician for the city board of health; on the staff of the Providence Hospital; aged 58; died, August 31, of coronary thrombosis.

James Edward Mansfield, Oswego, N. Y.; Dartmouth Medical School, Hanover, N. H., 1897; member of the Medical Society of the State of New York; for many years health officer; aged 69; on the staff of the Oswego Hospital; died in July.

Helmina Jaidell * Denver; Johns Hopkins University School of Medicine, Baltimore, 1912; member of the American Academy of Pediatrics; aged 60; died August 10, at St. Luke's Hospital of postoperative ileus and chronic intestinal obstruction.

David Forrest Kirkpatrick, Lewisville, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1885; Medical Department of Tulane University of Louisiana, New Orleans, 1887; aged 78; died, August 20, of carcinoma of the bladder.

Clarence H. Willis * Barnesville, Ga.; Atlanta College of Physicians and Surgeons, 1906; past president of the Lamar County Medical Society; aged 57; died, August 15, at the Middle Georgia Hospital, Macon, of cerebral hemorrhage.

Charles Miner Miller Jr. ☉ Olive View, Calif.; University of Pittsburgh School of Medicine, 1928; served during the World War; on the staff of the Olive View Sanatorium; aged 45; died, August 27, of a self-inflicted bullet wound.

Harold Cintra Cox, New York; University of Virginia Department of Medicine, Charlottesville, 1921; member of the Medical Society of the State of New York; aged 44; on the staff of the French Hospital, where he died, August 25.

John Harrison Timberman, Chillicothe, Mo.; St. Louis University School of Medicine, 1906; member of the Missouri State Medical Association; served during the World War; aged 62; died, August 22, of cerebral hemorrhage.

James Gregory Marron, Lincoln, Neb.; Bellevue Hospital Medical College, New York, 1887; member of the Nebraska State Medical Association; veteran of the Spanish-American War; aged 75; died, August 19, of cardiac infarction.

Percival Walter Darrah, Leavenworth, Kan.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the Kansas Medical Society; on the associate staff of St. John's Hospital; aged 67; died in August.

Loren Wilder ☉ Chicago; Rush Medical College, Chicago, 1901; fellow of the American College of Surgeons; chief of the surgical staff of the Edgewater Hospital; aged 66; died, August 19, of cerebral hemorrhage and arteriosclerosis.

Fred Farley Carpenter, Pella, Iowa; Drake University Medical Department, Des Moines, 1897; member of the Iowa State Medical Society; veteran of the Spanish-American War; aged 69; died, August 6, of coronary occlusion.

John Wesley Page ☉ Jackson, Mich.; University of Pittsburgh School of Medicine, 1914; aged 59; on the staffs of the Jackson Clinic and the W. A. Foote Memorial Hospital, where he died, August 22, of coronary occlusion.

Allen C. Holliday, Athens, Ga.; University of Georgia Medical Department, Augusta, 1884; member of the Medical Association of Georgia; for many years member of the board of education; aged 75; died, August 20.

Emil Otto Jellinek, San Francisco; Medizinische Fakultät der Universität Wien, Austria, 1892; served during the World War; formerly on the staff of the Mount Zion Hospital; aged 73; died, July 22, of coronary occlusion.

Isaac Sherman Clark, Long Beach, Calif.; Keokuk (Iowa) Medical College, 1898; member of the California Medical Association; aged 66; died, August 3, in St. Luke's Hospital, Spokane, Wash., of coronary thrombosis.

Jacob Heckmann ☉ New York; Hessische Ludwigs-Universität Medizinische Fakultät, Giessen, Hesse, Germany, 1896; on the staff of the Misericordia Hospital; aged 68; died, August 13, of coronary thrombosis.

Jefferies Buck ☉ Baltimore; University of Pennsylvania Department of Medicine, Philadelphia, 1895; aged 68; died, August 14, in the Union Memorial Hospital of arteriosclerosis and hypertensive cardiovascular disease.

Stanley B. Dickinson, Portland, Ore.; College of Physicians and Surgeons, School of Medicine of the University of Illinois, 1897; aged 68; died, July 22, in the Veterans Administration Facility of coronary sclerosis.

George Adelbert Emard ☉ Mansfield, Mass.; Tufts College Medical School, Boston, 1918; for many years on the staff of the Sturdy Memorial Hospital, North Attleboro; aged 56; died, August 3, of cerebral hemorrhage.

Charles C. Ross ☉ Clarion, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; secretary of the Clarion County Medical Society; county health officer; aged 72; died, August 5, of heart disease.

Haynes Watts Brownfield, Anthony, Kan.; Hospital College of Medicine, Louisville, Ky., 1901; member of the Kansas Medical Society; aged 59; died, August 2, of Buerger's disease and carcinoma of the bladder.

Burkert Clark ☉ Hamilton, Ohio; Miami Medical College, Cincinnati, 1901; served during the World War; aged 65; died, August 25, in the Veterans Administration Facility, Dayton, of cerebral arteriosclerosis.

George Thomas Laman, Cave City, Ark. (licensed in Arkansas in 1904); for many years member of the school board; member of the Arkansas Medical Society; aged 57; died, August 8, of angina pectoris.

Cyrille Phedora Verdon, Granby, Que., Canada; Laval University Faculty of Medicine, Quebec, 1895; Laval University Medical Faculty, Montreal, 1896; aged 66; died, July 24, of carcinoma of the esophagus.

William O. Bailey, Louisville, Ky.; University of Louisville Medical Department, 1888; member of the Kentucky State Medical Association; aged 76; died, August 4, in the Jewish Hospital of cerebral hemorrhage.

James Samuel Hyde, Fall River, Mass.; Columbia University College of Physicians and Surgeons, New York, 1902; aged 65; died, August 9, in the Union Hospital of diabetes mellitus and bronchopneumonia.

August Omer Truelove, Fort Wayne, Ind.; Indiana University School of Medicine, Indianapolis, 1915; served during the World War; aged 57; died, August 7, in St. Joseph's Hospital of pernicious anemia.

Charles Pusey McCracken, Colorado Springs, Colo.; University of Arkansas School of Medicine, Little Rock, 1918; member of the Colorado State Medical Society; aged 45; died, August 21, of myocarditis.

William L. Turner, Springfield, Mo.; Barnes Medical College, St. Louis, 1906; member of the Missouri State Medical Association; aged 68; died, August 30, in a local hospital of injuries received in a fall.

Clovis Hiram Robinson, Crane, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1937; member of the State Medical Association of Texas; aged 28; died, July 22, of nephritis.

Harry Thompson Liggett, Louisville, Ky.; Kentucky School of Medicine, Louisville, 1905; served during the World War; aged 64; died, August 17, in St. Joseph's Infirmary of staphylococci septicemia.

William Coleman Rountree, Fort Worth, Texas; University of Tennessee Medical Department, Nashville, 1895; aged 69; died, August 2, of hypertensive heart disease, nephritis and cerebral hemorrhage.

Samuel Augustus Sturm, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1895; member of the Medical Society of the State of Pennsylvania; aged 78; died, August 11, of carcinoma of the nose.

Arthur Lavoie, Sillery, Que., Canada; M.B., Laval University Medical Faculty, Montreal, 1886, and L.M., in 1888; M.D., Laval University Faculty of Medicine, Quebec, 1908; aged 75; died in August.

Joseph Alexander McCready, Greenwich, Ohio; Bellevue Hospital Medical College, New York, 1875; member of the Medical Society of the State of Pennsylvania; aged 91; died, August 18, of senility.

Homer Bowen, Walterboro, S. C.; University of Georgia Medical Department, Augusta, 1911; member of the South Carolina Medical Association; aged 52; died, August 26, of cerebral hemorrhage.

Everett Dayton Knight ☉ Anderson, Ind.; Indiana University School of Medicine, Indianapolis, 1925; aged 38; on the staff of St. John's Hospital, where he died, August 5, of cerebral hemorrhage.

S. W. Williams, Gassaway, Tenn. (licensed in Tennessee in 1910); formerly bank president and member of the board of education of Cannon County; aged 58; died, August 19, of coronary embolism.

Raymond Fox Roller ☉ Altamont, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1913; at one time mayor; aged 55; died, August 11, of cerebral hemorrhage.

Eugene Rischelle Delong, Geigertown, Pa.; Jefferson Medical College of Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; aged 69; died, July 27, of heart disease.

Carl Frederick C. Kramer, Chicago; University of Illinois College of Medicine, Chicago, 1909; aged 66; for many years on the staff of the Belmont Hospital; died, August 6, of heart disease.

Napoleon B. Houser, Charlotte, N. C.; Leonard Medical School, Raleigh, 1891; formerly on the staff of the Good Samaritan Hospital; aged 69; died, August 28, of cerebral hemorrhage.

Paul Clark Gilson, San Leandro, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1937; aged 29; died, July 10, of an overdose of sleeping capsules taken accidentally.

Ellis Brown Rhodes ☉ East Cleveland, Ohio; Western Reserve University Medical Department, Cleveland, 1897; aged 66; died, August 7, at his home in Shaker Heights of carcinoma of the colon.

Irving Jerome Bleiweiss, Cleveland; The School of Medicine of the Division of Biological Sciences, University of Chicago, 1933; aged 33; died, August 30, in Chicago of cardiovascular disease.

Robert J. Gauldin, Dallas, Texas; St. Louis College of Physicians and Surgeons, 1900; member of the State Medical Association of Texas; aged 69; died, August 5, of intestinal obstruction.

David Joseph Hetrick, Harrisburg, Pa.; Jefferson Medical College of Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; aged 67; died, July 11, of coronary occlusion.

George Wilkinson, Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1882; member of the Medical Society of New Jersey; aged 77; died, August 17, of arteriosclerosis.

Rupert William Ford, Otego, N. Y.; Albany (N. Y.) Medical College, 1899; member of the Medical Society of the State of New York; aged 65; died, August 17, of angina pectoris.

William Colfax Roberts, Owatonna, Minn.; University of Michigan Homeopathic Medical School, Ann Arbor, 1899; aged 70; died, August 25, of coronary thrombosis and chronic myocarditis.

Howard Conover, Barnegat, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1905; member of the board of health; aged 61; died, August 13, of cardiac insufficiency.

James H. Fargher ☉ La Porte, Ind.; Chicago Homeopathic Medical College, 1903; on the staff of the Holy Family Hospital; aged 64; died, August 6, of coronary thrombosis.

Minnie Agnes Hinch Conley, Wilmette, Ill.; Northwestern University Woman's Medical School, Chicago, 1901; aged 64; died, August 31, of chronic myocarditis and arteriosclerosis.

Annette B. Fiske Pomeroy, Pontiac, Mich.; Michigan College of Medicine and Surgery, Detroit, 1901; aged 77; died, August 26, in Stoney Point, of myocarditis and arteriosclerosis.

Heinrich Vogel, New York; Albertus-Universität Medizinische Fakultät, Königsberg, Prussia, 1896; aged 64; died, July 19, in Washington, D. C., of carcinoma of the sigmoid.

D. E. Bridgefarmer, McKinney, Texas (licensed in Texas under the Act of 1907); aged 80; died, July 22, of cerebral hemorrhage, hypertensive heart disease and arteriosclerosis.

C. Hector Sexton, Dunn, N. C.; University of Maryland School of Medicine, Baltimore, 1890; aged 83; died, August 30, in the Good Hope Hospital, Erwin, of coronary sclerosis.

Stephen A. Cunningham, Marietta, Ohio; Medical College of Ohio, Cincinnati, 1890; member of the Ohio State Medical Association; aged 71; died, August 14, of heart disease.

Claude Ely Simons, San Diego, Calif.; Hering Medical College, Chicago, 1902; aged 58; died, August 19, in San Francisco of coronary thrombosis and arteriosclerosis.

G. Howard Wilson, Dalton City, Ill.; National Normal University College of Medicine, Lebanon, Ohio, 1896; aged 67; died, August 31, of amyotrophic lateral sclerosis.

Albert Lafayette Foster, Corryton, Tenn.; National University Medical Department, Washington, D. C., 1897; for many years postmaster; aged 74; died in August.

Reuben L. Hust, Albuquerque, N. M.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; aged 69; died, August 19, of cerebral hemorrhage and leukemia.

William M. Edgerton, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1896; aged 69; died, August 4, of coronary sclerosis.

Robert Joseph Carey, North Brookfield, Mass.; Yale University School of Medicine, New Haven, Conn., 1928; aged 36; died, August 20, in Boylston of tuberculosis.

George W. Antoine, Houston, Texas; Meharry Medical College, Nashville, Tenn., 1906; served during the World War; aged 60; died, August 17, of heart disease.

Frank William Hewes, Groton, Conn.; University of Vermont College of Medicine, Burlington, 1894; aged 72; died, August 18, of carcinoma of the intestine.

George Henry Littlefield, Boston; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1878; aged 91; died, August 18, in the City Hospital.

John O. Briscoe, Weslaco, Texas; Missouri Medical College, St. Louis, 1887; aged 79; died, July 24, in Mission of complications following a fractured hip.

William Yancey White, Center, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1887; aged 78; died, August 11, of coronary occlusion.

Walter Odesly House, Tarboro, N. C.; Medical College of Virginia, Richmond, 1927; aged 41; was killed, August 22, near Nashville in an airplane accident.

Jesse Howard Hutten, Omaha; Howard University College of Medicine, Washington, D. C., 1898; aged 68; died, August 11, in Los Angeles of heart disease.

David Henry Braden, Wooster, Ohio; Homeopathic Hospital College, Cleveland, 1895; aged 71; died, August 13, of carcinoma of the liver and rectum.

Ben C. Crisler, Aberdeen, Miss.; College of Physicians and Surgeons, Memphis, Tenn., 1907; aged 52; died, August 10, of poisoning by carbolic acid, self administered.

Gilbert Leroy Pray, Lake City, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; aged 63; died, August 19, of bronchopneumonia.

Orley Haven Van Eman ☉ El Centro, Calif.; College of Medical Evangelists, Los Angeles, 1924; aged 40; died, August 24, of a self-inflicted bullet wound.

Sylvester Sutton Hamilton, Punxsutawney, Pa.; Columbus (Ohio) Medical College, 1878; aged 86; died, August 2, of a fractured hip received in a fall.

Wen Galaway Cutts, Pittsburgh; Detroit College of Medicine, 1909; aged 66; died, July 10, in St. Francis Hospital of carcinoma of the prostate.

John August Rolfs, Aplington, Iowa; Drake University College of Medicine, Des Moines, 1904; aged 70; died, August 29, of coronary occlusion.

James Harry Hagan, Lake Forest, Ill.; Drake University Medical Department, Des Moines, 1890; also a pharmacist; aged 76; died, August 27.

Floyd B. Moore, Fairhope, Ala.; Chicago Medical College, 1889; aged 71; died, August 5, of chronic myocarditis and arteriosclerosis.

Alexander A. Friedel, Memphis, Tenn.; Jefferson Medical College of Philadelphia, 1887; aged 79; died, August 1, of arteriosclerosis.

Burt Omen Jerrel, Oskaloosa, Iowa; Chicago Homeopathic Medical College, 1894; aged 70; died, August 17, of coronary occlusion.

Joseph Lafayette Minton, Hartman, Ark.; Missouri Medical College, St. Louis, 1880; aged 85; died, August 7, of pernicious anemia.

Timothy A. Daly ☉ Chicago; Northwestern University Medical School, Chicago, 1897; aged 65; died, August 16, of heart disease.

Edgar Merryman Parlett, San Francisco; Baltimore Medical College, 1902; aged 59; died, August 21, of a self-inflicted bullet wound.

Abraham B. Deany, Winchester, Ky.; Meharry Medical College, Nashville, Tenn., 1903; aged 62; died, August 13, of myocarditis.

Leonidas M. Jones, Harrison, Mich.; Detroit Homeopathic College, 1906; aged 63; died, August 28, of coronary thrombosis.

John William Wills, Wellston, Ohio; Kentucky School of Medicine, Louisville, 1890; aged 76; died, August 14, of pneumonia.

Davis H. Westfall, Polk, Neb.; John A. Creighton Medical College, Omaha, 1902; aged 64; died, August 11, of coronary occlusion.

Lewis Mendelsohn ☉ Jersey City, N. J.; Baltimore Medical College, 1901; aged 66; died, August 26, of pulmonary embolism.

Henry A. Smith, Sumner, Miss.; Missouri Medical College, St. Louis, 1879; aged 81; died, August 1, of coronary occlusion.

Edward Bower Flavien, New Haven, Ind.; Toledo Medical College, 1898; aged 63; died, August 27, of carcinoma of the lung.

David Finley Brown, Hudgins, Va.; Cleveland University of Medicine and Surgery, 1897; aged 82; died, August 15, of senility.

Henry G. Stemen, Lebanon, Ohio; Medical College of Fort Wayne, Ind., 1878; aged 88; died, August 16, of myocarditis.

Henry Robert Hay, Warton, Ont., Canada; Victoria University Medical Department, Coburg, 1887; died, August 21.

William John Beatty, Keewatin, Ont., Canada; Trinity Medical College, Toronto, 1896; died, August 23.

Robert Elice Calhoun, Tulsa, Okla.; Barnes Medical College, St. Louis, 1898; aged 70; died in August.

Bureau of Investigation

THE UNIVERSAL HEALTH FOUNDATION FRAUD

Post Office Closes Mails to F. L. Gailey and Z. Dominguez

Florence L. Gailey, a 70 year old woman, allegedly the widow of a physician who died in 1926, together with 73 year old Zeferino Dominguez, carried on from Los Angeles a rather elaborate piece of mail-order quackery under the trade styles Universal Health Foundation, Goode Products Company and Good Products Company. Mrs. Gailey was president and Mr. Dominguez was vice president of the concern.

The information that follows is based in part on material in the files of the Bureau of Investigation of the American Medical Association and, more largely, on the statements made by Judge Vincent M. Miles, Solicitor for the Post Office Department, in his memorandum to the Postmaster General recommending the issuance of a fraud order. Mrs. Gailey and Dominguez sold through the mails (1) a device called the "Miracle Exerciser," (2) a book entitled "Secrets of How to Live 150 Years" and (3) certain nostrums called, respectively, "Miracle Hemovida Tablets," "Miracle Digestall Tablets" and "Si-Nease Miracle Antiseptic." The business was started in 1931 under the name "The Miracle Exerciser Company," which was changed in 1935 to "Universal Health Foundation." No physicians, pharmacists or chemists were connected with the enterprise, and the nostrums, book and "exerciser" were purchased from other sources.

Mrs. Gailey is said to have told the Post Office officials that she had learned all she knew about the human system from her husband. She declared that she originated the Miracle Exerciser, which, according to the advertising, would prevent not only "senility and loss of sex power" but also "prolapses in all the vital organs" and would, in addition, "stimulate circulation in the scalp" and aid "in all heart disturbances." The Miracle Exerciser consisted of two spiral springs, each with a handle at one end while the other ends were connected by a metal plate or bar. The user was supposed to lie supine with the feet on the bar and a handle in each hand; the bar was to be pushed with the feet and the handles pulled with the hands. One variation in its use was for the user to lie with head hanging over the side of the bed for the alleged purpose of causing greater blood circulation in the head. The mischievous possibilities of such recommendation in cases of elderly people with sclerotic vascular systems may be imagined.

The nostrum "Hemovida" was said by the Gailey-Dominguez concern to be "based on the Nobel Prize Award of 1935"—whatever that might mean. The tablets were reported to contain seaweed (kelp), alfalfa, legume starch, cornstarch, chlorophyll, some animal matter (allegedly liver extract) and small amounts of iron, phosphorus, magnesium, sulfur, sodium and potassium. The "Miracle Digestall Tablets" were essentially of the same composition as Hemovida except that they contained

The Great Importance of
in
Extending the Span
of
HUMAN LIFE
by
F. L. Gailey

The World's Most Eminent Authority Diet-
etic And On Brain Degeneration—caused thru
injurious upright posture of the human body.

"Go Forth Unto Nature and Learn Her
Great Truths and Lessons."

Published 1937 By
UNIVERSAL HEALTH FOUNDATION
221 CONSOLIDATED BLDG.,
LOS ANGELES, CALIF.

no animal matter. The advertising led the public to believe that Hemovida would "produce more healthy red blood cells," would "raise the defenses of the body," "increase vitality" and cure pernicious anemia. The Digestall tablets were claimed to make it possible for oldsters to "retain your youthful appearance throughout the entire span of life." "Si-Nease Miracle Antiseptic" was a mixture of mineral oil and olive oil in which there was 1 per cent ephedrine, ethyl aminobenzoate, carbolic acid, menthol, camphor, eucalyptus and oil of thyme. Government tests were said to show that the stuff had "very weak inhibitory effects upon germs tested in vitro."

The only evidence offered by Gailey-Dominguez was statements from two alleged physicians respecting the claims made by the company. Only one of these statements was sworn and neither was supported by any evidence to show the qualifications of the writers or to show in fact whether those who made them were physicians. The statements were held to be incompetent as medical evidence and their incompetence was even admitted by the attorney for the Universal Health Foundation! Judge Miles expressed the opinion that "some of these alleged doctors' statements appear ridiculous on their face."

Even more preposterous, however, is the claim appearing under the name of F. L. Gailey on the cover of an advertising leaflet, shown (reduced) on this page. The claim reads as follows:

The World's Most Eminent Authority Diet-
etics And On Brain Degeneration—caused thru
injurious upright posture of the human body.

After the hearing in Washington Judge Miles, on going into the matter in detail, declared that the evidence showed that the scheme was a fraudulent one and he recommended that the Postmaster General issue a fraud order closing the mails to the concern. On Feb. 16, 1939, the mails were closed to Universal Health Foundation, Good Products Company, Goode Products Company, F. L. Gailey, president, Zeferino Dominguez, vice president, Z. Cortez, secretary, John Clark, assistant secretary, and their officers and agents as such.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Belding Skin Remidin.—International Stock Food Co., and Dr. Belding Medicine Co., Minneapolis. Composition: Chiefly alcohol, water, glycerin and small amounts of ethyl acetate and mercuric chloride. Its effectiveness as a cure for eczema, rash, scabies, plant poisoning, hives, barber's itch, ringworm, itching "piles," parasitic diseases, dandruff, etc., was fraudulently represented.—[N. J. 29253; December 1938.]

Ingersoll's Gall-Stone Pills, Gall Stone Remedy and System Cleanser.—G. A. Ingersoll Remedy Co., Milwaukee. Composition: Pills, phthalain (0.64 grain in each), small amounts of extracts of plant drugs, salicylate and menthol; Gall Stone Remedy and System Cleanser, a liquid medicine containing essentially a fixed oil, such as olive oil, with sugar and water, cinnamon flavored; and two powders, one a mixture of baking soda and sodium tartrate, and the other, tartaric acid. Representations made for the effectiveness of these nostrums in treating gallstone conditions were declared fraudulent.—[N. J. 29268; December 1938.]

Nature's Herb Tablets.—Washington Herb Co., Washington, D. C. Composition: Plant material, including aloe. Curative effect in blood liver, kidney, rheumatic and stomach disorders, ague, malaria, catarrh, nervous diseases, etc., was fraudulently represented.—[N. J. 29255; December 1938.]

Correspondence

POLIOMYELITIS AND TONSILLECTOMY

To the Editor:—Dr. H. G. Langworthy (THE JOURNAL, September 9, p. 1052) believes that we are unduly overwrought over the relationship of poliomyelitis and the removal of tonsils and adenoids. He states:

Considering that operations for tonsillectomy and adenectomy number possibly one fourth of all major operations that are performed yearly in the country and under all sorts of varying conditions and circumstances, one could well promote almost any idea, however untrue or remote, by citing the occurrence of a few sporadic cases. The removal of adenoids and tonsils, when necessary, is so important in the welfare of children that attempts to raise doubts and issues not clearly proved is to do great harm rather than good. Because a few cases of poliomyelitis occurring in summertime may have appeared after any operation, whatever that operation might accidentally have been, is no reason whatever to raise doubt and fear. If there is an epidemic of poliomyelitis in one's own community, any wise physician under these exceptional circumstances should easily recognize what is the best procedure to adopt. The summertime during the long vacation period is a good time for the removal of tonsils and adenoids in school children and should be consistently encouraged.

It is fairly well established by now, from the experimental, epidemiologic and clinical points of view, that the nasopharynx constitutes the portal of entry for the poliomyelitis virus. Any tissue injury present as a result of operation on the tonsils and adenoids, in the presence of a poliomyelitis epidemic, would tend to increase the susceptibility to the virus.

Silverman (Acute Poliomyelitis in Syracuse, N. Y., *Am. J. Dis. Child.* 41:829 [April] 1931) reported five cases of infantile poliomyelitis following tonsillectomies and adenoidectomies (Fischer, A. E., and Stillerman, Maxwell: Acute Anterior Poliomyelitis in New York, 1935 [A Review of 686 Cases], *Am. J. Dis. Child.* 54:984 [Nov.] 1937).

That a seasonal variation exists, one must remember that the peak of poliomyelitis not infrequently corresponds to the heavy pollen concentration during late August and September months (Felderman, Leon: Acute Anterior Poliomyelitis with Special Reference to Its Rhinological Aspect, *Laryngoscope* 48:802 [Nov.] 1938).

It is a mistake to advise parents that the summer is the ideal time for tonsil and adenoid surgery. As a matter of fact, the cooler months of the year offer the child a more auspicious time without undue risks.

LEON FELDERMAN, M.D., Philadelphia.

PRIMARY TUBERCULOSIS IN ADULTS

To the Editor:—As I have been especially interested in primary tuberculosis in adults for several years and recently published an article on the subject, together with Hedvall (Malmros, Haqvín, and Hedvall, Erik: Studien über die Entstehung und Entwicklung der Lungentuberkulose mit besonderer Berücksichtigung des Verlaufs der tuberkulösen Erstinfektion des Jugendlichen und Erwachsenen, *Tuberkulose-Bibliothek* No. 68, Leipzig, Johann Ambrosius Barth, 1938; reviewed in THE JOURNAL, Dec. 17, 1938, p. 2331), may I be allowed to make a few comments in connection with the editorial entitled "Primary Tuberculosis in Adults" in THE JOURNAL, July 8, page 146. It concerns the following statement: "Primary infection in adults, other things being equal, appears to be . . . no more grave than in children" and in addition the following points from page 147, taken from the article of Myers and his co-workers:

The first infection type of tuberculosis, as observed in this group of adults, has resulted in no significant symptoms or abnormal physical signs throughout the entire course of development. Indeed, he states, the lesions in the majority of their cases would not have been known to exist had it not been for periodic tuberculin tests, and the making of roentgenograms of the positive reactors. It apparently makes no difference at what time of life the first infection with tubercle bacilli occurs with reference to the average type of tuberculosis in human beings.

In order to understand the importance of primary tuberculosis in adults, it is surely essential to study in detail cases in which the tuberculin reaction in adults has changed from negative to positive and to check up on them by frequent roentgenograms during the years immediately following. In our work Hedvall and I have given a report of 151 such cases of primary tuberculosis in adults. Of these, 104 showed no symptoms besides the positive tuberculin reaction. Of the other forty-seven cases, a primary complex or merely enlarged hilus glands could be shown roentgenologically in twenty-one cases. In these cases there usually appeared in connection with the infection general symptoms such as fever, symptoms of influenza, increased sedimentation rate and, in women very often, erythema nodosum. In some cases pleurisy developed after an interval of a few months and in others actual pulmonary tuberculosis resulting from "subprimary initial lesions" in the supraclavicular region. In some of the cases the first sign of tuberculous infection was an exudative pleurisy. The primary infection can also first appear as acute miliary tuberculosis. In all these different forms of primary tuberculosis in adults there generally appeared in connection with the infection, as in children, more or less pronounced general symptoms for which the persons concerned sought medical aid because of feeling ill. Again, in other cases (fourteen) actual tuberculosis of the lungs gradually developed without any general symptoms and often with a normal sedimentation rate. Changes in the lungs were discovered here only by means of systematic roentgen supervision. The first detectable lesions were in the form of "subprimary initial lesions"—diffuse, cloudlike spots of different size, often multiple, and in the majority of cases situated in the supraclavicular region or in the first intercostal space. In a considerable number of cases the initial apical lesions were the first manifestation of a progressive type of pulmonary tuberculosis. The conditions found in those cases in which the tuberculin reaction was positive at the time of the first examination corresponded well with those in the aforementioned group of cases. A subclavicular infiltrate of the Assmann type was only rarely found to be the earliest lesion.

As is evident from the foregoing, primary tuberculosis in adults can appear in different forms. In some cases the infection gives pronounced general symptoms; then enlarged hilus glands are most often found, and sometimes a typical primary complex. In many cases, however, progressive tuberculosis of the lungs develops in close connection with the infection (already after a few months) without the person concerned feeling ill. It may be of great interest to know of this form of primary tuberculosis in adults, for it can be discovered only by systematic roentgen examinations. It is possible, and perhaps likely, that it is just this form of tuberculosis which is the cause of the high morbidity and mortality in tuberculosis of the lungs in persons between the ages of 20 and 30. In any case, one must probably count on the fact that primary infection in adults is more grave than in children, for among children, as is well known, one finds progressive tuberculosis of the lungs rather seldom. From the point of view of national economy it might be more important to sacrifice work and money in examining young adults rather than children of school age. As far as I can understand, there has been as yet but slight advantage from all mass examinations (x-ray) of children. On the contrary, one might be able to expect better results from tuberculin and roentgen examinations (with frequent supervision) of young adults.

Lastly, may I draw attention to a little typographic error on page 146. In the report of Heimbeck's examination it says "The highest morbidity was in the nurses who were positive at the time of admission." I presume that the word should have been negative.

HAQVIN MALMROS, M.D., Örebro, Sweden.

TUBERCULOUS WOUND INFECTION AFTER NEPHRECTOMY

To the Editor:—A man aged 44 was operated on six months ago and had a right tuberculous kidney removed. After six weeks the wound broke open and has remained so ever since. I used irrigations of "mercesin" solution, ultraviolet rays, calcium orally and large doses of super D vitamin. There has been little or no improvement during the last six months. The Wassermann reaction is negative and x-ray examination of the chest is negative. I have been advised that tuberculin might be of some value. Kindly advise me whether you feel that it is worth a trial and as to the method of use. Victor P. Dalo, M.D., Louisville, Ky.

ANSWER.—It is evident that the patient has a widespread tuberculous infection of his wound. The reason of this occurrence in an occasional case has been the subject of much speculation. Among the theories advanced are the following: 1. The wound becomes infected from the ureteral stump. 2. Some of the perineal fat that has been left behind harbors tubercle bacilli and, following surgical trauma, breaks down, and so the wound becomes infected. 3. A short time ago a new theory was advanced to the effect that these wounds become infected by the blood stream.

As far as treatment is concerned, there are two schools of thought—the one is medical and the other is surgical. The adherents of the medical point of view in the management of tuberculous wounds advise plenty of rest in bed, lots of sunshine or the use of ultraviolet rays, cod liver oil and the like; in other words, a general program of management such as one employs in any case of tuberculosis. The treatment of the wound consists of dry dressings and the occasional applications of Peruvian balsam. Under this sort of a program most of these wounds heal, although it takes a long time.

The surgical school believes in closing the wounds by operation, removing the tuberculous tissue by means of a dull curet and suturing the wound with silver wire. While healing may be slow under the medical program, the wound generally heals. It is to be remembered that after operation the wound may again become infected and break down.

The use of tuberculin is not advised. It might be advisable to try dressings of cod liver oil.

ATROPINE AND ITS DERIVATIVES

To the Editor:—1. Would you please inform me whether any of the newer atropine preparations, such as novatropine and syntropan, have advantages over the time-honored extract and tincture of belladonna and atropine sulfate? 2. Will the administration of the extract of belladonna, one-fourth grain three times a day, or of atropine sulfate, $\frac{1}{4}$ grain three times a day, produce therapeutic effects on the gastrointestinal tract equal to those obtained by the usual increasing doses of tincture of belladonna? 3. Does the extract of belladonna have any advantage over atropine sulfate? It seems more usually prescribed when capsules or pills are desired, especially in combination with other drugs.

M.D., New York.

ANSWER.—The synthetic substitutes for atropine have been prepared to overcome the side actions which limit the use of atropine in full dosage. These undesirable side actions of atropine which occur when atropine is used in full therapeutic dosage over a period of time include extensive drying of the mucous membranes and skin, a persistent mydriasis, a rapid heart due to the action on the vagus, and a continual desire to micturate. Larger doses may produce more serious manifestations and restlessness. Also in persons over the age of 50 and in those with a tendency to an increased intra-ocular tension the tendency of atropine to increase this condition must not be disregarded. Novatropine and syntropan are both included in New and Nonofficial Remedies for 1939.

Atropine or belladonna is frequently used over an extended period in the treatment of gastrointestinal conditions to reduce spasm of the smooth muscle and also to reduce the secretion of hydrochloric acid in the stomach. The newer synthetics, such as those mentioned, will reduce spasm of the smooth muscle, but there is some question as to whether they will inhibit the secretion of hydrochloric acid to the same degree as an equivalent amount of atropine.

1. If relief of spasm of the smooth muscle is desired over a period of time, the synthetics will control this with a minimum degree of the undesirable side actions mentioned.

2. Since the extract of belladonna is a 400 per cent preparation (i. e. 1 Gm. of the extract contains the active principles of 4 Gm. of the crude drug) and since belladonna leaves contain not less than 0.3 per cent of mydriatic alkaloids, one-fourth grain (0.016 Gm.) of the extract contains 0.0002 Gm. ($\frac{1}{500}$ grain) of the total alkaloids. If equivalent quantities of

the tincture which is a 10 per cent preparation are used, equal effect on the gastrointestinal tract will be produced.

3. Belladonna contains eight or more alkaloids. They all have practically the same action on smooth muscle, but some are hypnotic and some stimulating to the cerebral cortex. They are present in the extract in the proportion that they occur in the plant. The activity is due mainly to atropine and hyoscyamine. The latter alkaloid is equivalent to atropine in its central effect. If rather large doses of belladonna are to be used over a period of time, the extract might be more desirable than atropine sulfate, owing to the lessened mental effect of the extract when given in equivalent amounts.

INDUSTRIAL DERMATITIS

To the Editor:—I am seeking information as to the cause of a dermatitis, apparently of occupational origin. With a negative history for any similar condition previous to 1938, the patient broke out with a maculopapular rash confined chiefly to the ventral surfaces of the forearms, which persisted until the middle of April (having started in January); he began this particular work, i. e., as a laborer in a creamery, July 1, 1937, the work consisting chiefly of sterilizing and cleaning equipment. Some of the lesions became pustular and for these he received inoculations with beneficial results. He was free from any recurrence until March 15, 1939, when the condition returned and has persisted since. The itching coming on during the night is most distressing, and from his scratching some pustular lesions develop. The materials used in his work are as follows: (1) a preparation called Pep-Tex, which is a milk-stone remover made by the Diversy Corporation, Chicago; (2) Diversol, a chlorine preparation made by this firm; (3) a boiler compound for cleaning the boilers; (4) a copper polish, which is a reddish powder, and (5) chlorine. It is with this group of things that I hope you will be able to help me, by suggesting causes of such a dermatitis as we have in this instance.

R. S. Quackenbush, M.D., Goshen, N. Y.

ANSWER.—All the substances that the patient uses are potential cutaneous irritants. Pep-Tex contains strong alkalis, such as trisodium phosphate, and sodium silicate mixed with sodium chromate. It will irritate the skin if allowed to remain on it for any length of time. It will also enter cuts and abrasions to form chronic ulcers. In addition to this the sodium chromate may also act as a cutaneous sensitizer.

Diversol is also strongly alkaline and in addition contains sodium hypochlorite, which may itself be a cutaneous irritant.

Boiler compounds are also strongly alkaline, containing such substances as sodium hydroxide, sodium carbonate, trisodium phosphate and sodium fluoride, all of which will irritate the normal skin.

Copper polishes may contain crude sodium carbonate, oxalic acid, oleic acid, quartz or silica. The color may be due to paris red or to iron oxide. The sodium carbonate and the oxalic acid are powerful irritants of the skin.

Chlorine can also irritate the skin.

It is advisable that the treatment in this case consist only in the application of mild lotions or ointments, such as boric acid or calamine, and the wearing of long rubber gloves while working to prevent further contact with any of the irritants.

EPHEDRINE IN RHINOLOGY

To the Editor:—I have been asked to get an opinion as to the use of ephedrine in the treatment of various nasal conditions. The company making this inquiry states that there seems to be some doubt in the minds of the medical profession as to the wisdom of using ephedrine in the treatment of various nasal conditions.

M.D., North Carolina.

ANSWER.—Ephedrine and its salts are drugs of choice for local use in the nose in cases in which the pharmacologic effect of a vasoconstrictor is desired. Thus it is used in acute rhinitis, acute sinusitis and the like. As shown by Proetz and others, ephedrine in weak solutions, from 1 to 3 per cent, has no deleterious effects on ciliary action. In accord with present day thought, ephedrine is best used in physiologic solution of sodium chloride rather than in an oily preparation. It is also well used in weak dilutions, from 0.25 to 0.5 per cent, in the displacement method of treatment as advocated by Proetz.

Although ephedrine is perhaps one of the more important drugs in the treatment of acute and subacute nasal conditions, it must be used with caution in chronic nasal disease. Thus, for example, in vasomotor rhinitis and perennial nasal allergy, in which there is chronic nasal obstruction and the need for relief is constant, ephedrine should be used with caution, for it, as do similar drugs, may act as a sensitizing agent when used indiscriminately. A transient vasoconstriction is followed in many instances by a prolonged vasoparalysis; sneezing, a watery discharge and itching become prominent complaints, and the original disease is much aggravated and prolonged by the very medication intended to relieve it.

DISGUIISING TASTE OF SULFATES

To the Editor:—Please let me know what powder is best used to disguise sulfate as to taste.
F. W. Cobar, M.D., Milwaukee.

ANSWER.—The question as to disguising sulfate is rather general and indefinite, as it does not specify a particular one. It is not the sulfate but rather the specific radical attached that needs disguising.

As to disguising sulfates in the dry form: Magnesium sulfate is least unpalatable in the form of the effervescent salt of magnesium sulfate N. F. VI. Sodium sulfate may also be made into effervescent form. Either is perhaps best taken in ice cold lemonade. Tablets of codeine sulfate, quinine sulfate and strychnine sulfate are official in N. F. VI and can be easily swallowed without having the patient experience the bitter taste. The sulfates that need not be given in too large dosage may be dispensed in capsule form.

As to disguising sulfate in liquid form: Codeine sulfate and strychnine sulfate may be well disguised by the use of compound syrup of eriodictyon N. F. VI. Ephedrine sulfate may be prescribed in cherry syrup and is official in N. F. VI under the title "syrup of ephedrine sulfate."

SMOKING ACETYSALICYLIC ACID WITH TOBACCO

To the Editor:—For the past nine years I have been jail physician and during that time it has been frequently called to my attention that certain inmates were in the habit of crushing tablets of acetylsalicylic acid and putting the powder in tobacco and smoking the mixture. Can you tell me what the effect of the mixture would be from a single smoke and what would be the effect of the continuous use of acetylsalicylic acid in this way?
M.D., District of Columbia.

ANSWER.—A search of the literature has failed to reveal any reports on the effects of inhaling the vapors of acetylsalicylic acid in tobacco smoke. When this drug is mixed with tobacco and smoked as described, several products would be formed and inhaled. Some of the acetylsalicylic acid would probably be volatilized and inhaled as the unchanged acetylsalicylic acid. There would be some salicylic acid and acetic acid inhaled and absorbed and also some other disintegration products of the drug. These substances sensitize the mucous membranes of the respiratory tract and in this way would enhance the effects of the tobacco itself. In addition, the inhalation of the vapors of acetylsalicylic acid would have the usual effect of this drug but to a much greater degree, because of the avenue of entrance into the body. The inhalation of salicylic acid vapors in sufficient amounts produces a nervous exaltation and a cerebral inhibition somewhat resembling that produced by alcohol. This is followed by depression.

It is difficult to say just what the effect of a single smoke would be. The effect of the continuous use of acetylsalicylic acid in this way would vary, just as the continued use in the ordinary way produces different effects in different persons. In addition to the physiologic effect produced by smoking acetylsalicylic acid, the psychic effect in these individuals must not be disregarded.

ATROPINE POISONING

To the Editor:—A patient took an overdose of belladonna about one year ago and still complains of some of the symptoms of acute atropine poisoning. Is it possible for her to have a persistence of these symptoms after such a period of time? My pharmacology textbook states that atropine is fully eliminated in thirty-six hours in the urine. Is it possible that some of the belladonna has become stored somewhere in the body? Her pulse has been 100 or over ever since the poisoning. She breaks out with a measles-like rash over the back every now and then. She has lost her sense of smell.
M.D., California.

ANSWER.—The size of the overdose of belladonna is not given, so that it is difficult to predict the possible effects. Doses of belladonna, of both the tincture and the fluidextract in amounts up to ten times the U. S. P. doses, have been administered over a period of time without any harmful effects persisting after the drug was stopped.

Atropine, to which the effects of belladonna are mainly due, is rapidly absorbed by mucous membranes and the intestine. If atropine is given in ascending dosage to animals over a period of time, the drug may be stored in their flesh for several days and this flesh may produce atropine intoxication in other animals if it is consumed in sufficient quantities. It disappears rapidly from the blood and is excreted, mostly unchanged, entirely by the urine, mainly within thirty-six hours. In acute atropine poisoning the effects are felt in an hour or less, while in slower poisoning the full effect may not develop for one or two days.

In both cases the effects gradually pass off. The mydriatic action may persist two weeks and the mental or psychic symptoms even longer. Idiosyncrasy to the belladonna group is quite frequent.

In the case described it is extremely improbable that the symptoms of acute belladonna poisoning could persist after a year. The rapid pulse and the occasional measles-like rash point to an unstable vasomotor system. The drug could not now be active on the vagus, and the rash is certainly not due to any retained atropine. It is more probable that the patient is of the nervous type and is susceptible to suggestion. If she can be really convinced that there is no longer any retention of the drug her symptoms may disappear.

MAGNETS FOR REMOVAL OF OCULAR FOREIGN BODIES

To the Editor:—Will you kindly furnish me with some information regarding magnets for removal of intra-ocular foreign bodies? Are the inexpensive magnets now advertised by reputable instrument houses satisfactory for this work? These work on alternating current with no rectifier and, I believe, cost less than \$15.
M.D., Alabama.

ANSWER.—The value of a magnet in the removal of intra-ocular foreign bodies depends on the strength and extent of the magnetic field. The more powerful the magnet, the simpler is the extraction and the less trauma does the eye suffer. For fairly superficial foreign bodies or for such as are located in the anterior chamber and can be removed through a simple keratome incision, the simpler and hence weaker magnets suffice. But for the foreign bodies that have penetrated deeply and as a result of time may be tightly embedded in ocular tissues, the most powerful magnet is none too strong. A comparison of the relative value of magnets is not available, but the most satisfactory of all the magnets on the market is the one that was devised a few years ago by Dr. Walter B. Lancaster of Boston.

PERSISTENT PAIN FROM SYPHILITIC PERIOSTITIS

To the Editor:—Kindly advise me how to control pain and tenderness in syphilitic periostitis that has apparently been resistant to analytic treatment. A woman aged 27, without a history of initial or secondary lesions, complained of pain in both shins at night. X-ray examination of the tibia was negative; serologic examination of the blood was positive, and the spinal fluid was normal. During the past year she has had thirty injections of mapharsen and of nearsphenamine, sixty injections of bismuth and large doses of potassium iodide. The pain and tenderness in the tibia, clavicles and calvarium have never been relieved completely. Blood studies showed a slight hypochromic anemia but no signs of blood dyscrasia. Serologic examination of the blood is still positive.
M.D., Indiana.

ANSWER.—The persistence of the pain in the tibia, clavicles and calvarium following the amount of treatment that this patient has been given and the negative x-ray examinations would suggest some factor other than syphilis as the cause of the difficulty. As a rule the "night pains" of syphilis disappear readily following several injections of an arsenical preparation, but occasionally patients with osseous syphilis derive a more pronounced benefit from the intramuscular use of a mercuric preparation. If further search reveals no other explanation for the discomfort, a course of twenty injections of mercuric succinimide, one-sixth grain (0.01 Gm.), in conjunction with large doses of potassium iodide, up to fifty drops three times a day, should be tried.

ROENTGEN THERAPY IN BONE TUBERCULOSIS

To the Editor:—May I have a brief statement of the present value of roentgen therapy for bone and joint tuberculosis, especially the elbow joint and the ulna?
Arnold Bockar, M.D., Warwick, N. Y.

ANSWER.—Tuberculosis affecting bones and joints often responds well to roentgen treatment but, like tuberculous processes in general, the response is usually slow. As in all chronic inflammations that are amenable to roentgen treatment, tuberculous lesions of bones and joints are best treated by doses corresponding to about three fourths of an erythema dose, and the treatment should be repeated regularly at intervals of three or four weeks. At first (if sinuses are present) there may be increased drainage for a short time; later the drainage diminishes steadily, and in the course of from six to twelve months, and occasionally longer, healing may take place (Desjardins, A. U.: The Action of Roentgen Rays on Tuberculous Processes, *Wisconsin M. J.* 34:719 [Oct.] 1935).

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examination of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, October 21, page 1588.

STATE AND TERRITRIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science*. Tucson, Dec. 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson.

ARKANSAS: *Medical (Regular)*. Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison. *Medical (Eclectic)*. Little Rock, Nov. 9-10. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Medical (Regular)*. Examination. Hartford, Nov. 14-15. *Endorsement*. Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homoeopathic)*. Derby, Nov. 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: Jacksonville, Nov. 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular*. Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*. Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Ruslimore, 413-F State House, Boston.

MISSISSIPPI: *Reciprocity*. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

NEBRASKA: Lincoln, Nov. 24-25. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Written examination and reciprocity with oral examination*. Carson City, Nov. 6. Sec., Dr. John E. Worden, 311 W. Robinson St., Carson City.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.

NORTH CAROLINA: *Reciprocity and Endorsement*. Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 5-7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science*. Oklahoma City, Nov. 6. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. *Medical*. Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science*. Portland, Feb. 24. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: Austin, Nov. 20-22. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Fairmont, Nov. 6-8. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science*. Milwaukee, Dec. 2. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Tennessee June Examination

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held at Knoxville, Memphis and Nashville, June 15-16, 1939. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eighteen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine.....	(1937)		86.1
Howard University College of Medicine.....	(1937)		83.8
87.9, 89.2, (1938) 88.4			
Harvard Medical School.....	(1939)		84.6
St. Louis University School of Medicine.....	(1938)		82.6
(1939) 80.6, 83.9, 85.1, 85.5, 85.6, 85.7, 85.8, 86.3,			
87.1, 87.2, 87.6, 87.7, 89.6			
Hahnemann Med. College and Hospital of Philadelphia (1937)			85.2

Jefferson Medical College of Philadelphia.....	(1938)	86.4
University of Pennsylvania School of Medicine.....	(1939)	86.5
Meharry Medical College.....	(1939)	85,
85.6, 85.8, 86, 86, 86.2, 86.3, 86.5, 86.6, 86.6, 86.8,		
86.8, 87, 87.1, 87.3, 87.4, 87.4, 87.5, 87.6, 87.7, 87.8,		
87.9, 88.1, 88.2, 88.4, 89, 89.2, 89.3, 89.8, 91.6		
University of Tennessee College of Medicine.....	(1937)	88.7,
(1939) 84.2, 84.5, 85, 85.3, 85.3, 85.7, 85.9, 85.9,		
86.9, 88, 88, 88, 88, 88.2, 88.7, 88.8, 89, 89.1,		
89.4, 89.4, 90.7, 91.5, 93.5		
Vanderbilt University School of Medicine.....	(1931)	85.8,
(1939) 82.3, 82.6, 83.9, 84.3, 84.3, 85.2, 85.3, 85.5,		
85.8, 85.9, 86, 86.1, 86.2, 86.3, 86.4, 86.7, 87, 87,		
87, 87.1, 87.1, 87.3, 87.5, 87.7, 87.7, 87.9, 87.9, 88,		
88.1, 88.2, 88.6, 88.6, 88.7, 89.3, 89.9, 90, 90.4, 91.8,		
92.3		
McGill University Faculty of Medicine.....	(1937)	94.3

Thirteen physicians were licensed by endorsement from March 14 through July 18. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
University of Arkansas School of Medicine.....	(1936)		Arkansas
George Washington University School of Medicine.....	(1927)		Dist. Colum.
University of Georgia School of Medicine.....	(1936)		Georgia
College of Physicians and Surgeons of Chicago.....	(1912)		Indiana
University of Illinois College of Medicine.....	(1930)		Mississippi
Louisiana State University School of Medicine.....	(1939)		Louisiana
Tulane University of Louisiana School of Medicine.....	(1936, 2)		Louisiana
University of Maryland School of Medicine and Col-			
lege of Physicians and Surgeons.....	(1937)		Maryland
University of Michigan Medical School.....	(1933)		Michigan
Jefferson Medical College of Philadelphia.....	(1934)		Penna.
University of Pennsylvania School of Medicine.....	(1936)		Penna.
Medical College of the State of South Carolina.....	(1937)		S. Carolina

North Dakota July Report

Dr. G. M. Williamson, secretary, North Dakota State Board of Medical Examiners, reports the oral and written examination held at Grand Forks, July 4-7, 1939. The examination covered twelve subjects and included ninety questions. An average of 75 per cent was required to pass. Nine candidates were examined, all of whom passed. One physician was licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School... (1938)	85.4, (1939)		81.3*
Harvard Medical School.....	(1935)		85.2
University of Minnesota.....	(1936)		80.8
University of Oregon.....	(1938)		79.2
Univ. of Western Ontario Medical School... (1936)	75.4, (1938)		78.4
McGill University Faculty of Medicine.....	(1936)		80.8
Regia Università di Napoli Facoltà di Medicina e			
Chirurgia.....	(1936)		80.1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine.....	(1926)		Illinois

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
College of Medical Evangelists.....	(1928)		N. B. M. Ex.
Harvard Medical School.....	(1929)		N. B. M. Ex.

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Minnesota June Report

Dr. Julian F. Du Bois, secretary, Minnesota State Board of Medical Examiners, reports the written, oral and practical examination held at Minneapolis, June 20-22, 1939. The examination covered twelve subjects and included sixty written questions. An average of 75 per cent was required to pass. Fifty-six candidates were examined, all of whom passed. Four physicians were licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Emory University School of Medicine.....	(1937)		85.1
Loyola University School of Medicine.....	(1939)		89.6
Northwestern University Medical School... (1936)	86.5, (1938)		91.2
Rush Medical College.....	(1936)	85.3, (1938)	87.3, 88.6
State University of Iowa College of Medicine.....	(1938)		89
University of Michigan Medical School.....	(1937)		87.2
University of Minnesota Medical School.....	(1938)		84.4,
85,* 86.2,* 87,* 87.1, 88,* 89.6,* (1939) 82.2, 83.4,			
83.5, 84.2,* 84.5,* 85, 85.1,* 85.1,* 85.5,* 86,* 86, 86.5,			
86.6,* 86.6, 87.1,* 87.1,* 87.1,* 87.3,* 87.5,* 87.5,*			
88.1,* 88.3,* 88.3,* 88.3, 89,* 89.1, 89.2, 90.5, 91.1,*			
92.1			
Washington University School of Medicine.....	(1937)		88.1
Cornell University Medical College.....	(1935)		89.1
University of Oregon Medical School.....	(1938)		86.4
University of Pennsylvania School of Medicine.....	(1936)		90

Marquette University School of Medicine.....	(1939)	85.1,	87,	89.6
University of Wisconsin Medical School....	(1936)	88.1,	(1938)	83.5
University of Manitoba Faculty of Medicine.....	(1935)			85.6

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine..	(1932),	(1936)	Iowa
Johns Hopkins University School of Medicine.....	(1928)		Louisiana
University of Minnesota Medical School.....	(1938)		Washington

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School.....	(1939)	N. B. M. Ex.	
New York University College of Medicine.....	(1936)	N. B. M. Ex.	

*This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Menstrual Disorders: Pathology, Diagnosis and Treatment. By C. Frederic Fluhmann, B.A., M.D., C.M., Associate Professor of Obstetrics and Gynecology, Stanford University School of Medicine, San Francisco, California. Cloth. Price, \$5. Pp. 329, with 119 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

This excellent monograph is ineptly named, since the first 152 pages deal with the processes of normal menstruation; viz., the morphologic changes, the physiology and the mechanism of the hormonal controls of the menstrual process. The opening chapter is a splendid historical review of the concepts of menstruation. The morphologic changes and the histopathology are excellently written and particularly well illustrated. The complicated pictures of the hormonal control of menstruation are presented clearly and simply and the references to the literature and bibliography are almost all inclusive. The latter half of the book deals with the pathology of menstruation rather adequately in the light of our present knowledge. It leaves something to be desired, however, in its style, there being considerable overlapping and repetition. These remarks should not detract from the value of the work and the appeal which it should have for the practitioner of medicine. It is by far the best discussion of this problem for the general practitioner that is available today.

Report on Cardiazol Treatment and on the Present Application of Hypoglycemic Shock Treatment in Schizophrenia. By W. Rees Thomas, M.D., F.R.C.P., D.P.M., Medical Senior Commissioner of the Board of Control, and Isabel G. H. Wilson, M.D., M.R.C.P., D.P.M., Medical Commissioner of the Board of Control. Board of Control (England and Wales). Paper. Price, 30 cents. Pp. 70. New York: British Library of Information; London: His Majesty's Stationery Office, 1938.

This is a remarkable book which contains a wealth of accurate data, gathered from dependable and well known authors, a book which bears the backing for accuracy of the English board of control.

The authors tried to be objective as far as is humanly possible and to refrain from personal prejudice. Matter of fact objection is raised to taking very much from the literature of the originators for granted and neglecting to point to the differences which are obvious in the "history" of the development of the treatment as well as the theory. The technic and the results from various authors are stated as completely and efficiently as possible. It seems sometimes that the description of the rather simple technic of the shock produced through metrazol alone is too detailed and elaborately stated. With the same extreme accuracy, the authors describe the technic of the shock produced through insulin treatment, although they had already done so in their first publication. The many variations and possibilities are described and the experiences of the authors are freely mentioned. A wealth of reports from the literature and experiences are presented in such a manner that one interested in a particular question can easily find the details. The book is certainly helpful to any one who needs advice in some particular difficulty.

In the enumerating of the complications and dangers which occur with the use of metrazol alone, the authors are rather too short. They did not cover the numerous publications in America about this subject. In neglecting these and in bringing in just the statement from Meduna, they have made the danger of this treatment appear in an entirely different light from that in which we see it in this country. In reporting the results of treatment by metrazol alone and by insulin alone, they display the same shortcomings. It seems rather strange that the authors,

reporting about American results, neglected the first hand reports, for example the official statistics from the Mental Hygiene Department of the state of New York, published by Superintendent Ross, and used rather the information about the American material given them by Dr. Meduna. They should not have chosen this volunteered information just because it was more accessible. Availability is not sufficient to secure preciseness.

In such a book one expects to find first hand reports on results. By neglecting them the authors create an impression concerning the experience in America, especially with metrazol treatment, entirely opposite to the real situation. The fact that the authors preferred to take their statistics for this country from hearsay instead of using the original official reports from the state of New York, covering a great number of cases, spoils the good record of this book. If they had done it properly it would have shown, as reflected now from the literature and as Sakel pointed out long ago, that the epileptic fit is valuable as symptomatically used by himself but does not have vast importance for a permanent cure.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1938 with the Comments That Have Appeared in The Journal. Cloth. Price, \$1. Pp. 122. Chicago: American Medical Association, 1939.

This volume tells why the Council on Pharmacy and Chemistry has rejected or why it has not yet accepted the products considered in a given year. In addition it may contain authoritative monographs on the current status of such pharmacologic or therapeutic questions as may have been raised in the course of the Council's deliberations. The last named category is represented in the current volume by the report on the omission from N. N. R. of all creosote and guaiacol compounds. After extensive consideration of the literature and of data furnished by the pharmaceutical firms whose products stood accepted, the Council came to the conclusion that the oral use of such preparations for action on the respiratory passages could be defended only on empirical grounds and that, therefore, they are not a necessary part of the modern therapeutic armamentarium.

Another status report in this volume is that on the use of colloidal sulfur in the treatment of chronic arthritis. After considering the referee's exhaustive report of the literature, the Council concluded that claims for the use of colloidal sulfur in the treatment of chronic arthritis are at present unwarranted and cannot be recognized until satisfactory evidence is available with regard to the following factors: the determination of the types of cases in which it may be used with a fair expectation of benefit; the determination of the chief contraindications; the determination of the optimal dosage; the determination of the best form in which sulfur is to be used, whether as food rich in sulfur, as ordinary sulfur administered orally or as colloidal sulfur for intramuscular or intravenous injection.

Among the preliminary reports in this volume, that on Sulfapyridine, which carries a special article by Dr. Perrin H. Long, a Council member who has been much concerned with the work on this drug, is perhaps of greatest interest. After the Food and Drug Administration had released the drug for the use of physicians early in 1939, the Council accepted various brands for inclusion in New and Nonofficial Remedies and in connection with the published descriptions issued another status report (THE JOURNAL, May 6, 1939, p. 1830) based on a questionnaire sent to men who had been prominent in the experimental use of the drug. This report, no doubt, will appear in the next volume of reprinted Council reports.

The status report on Immune Globulin (Human) appearing in this volume is another example of the procedure just mentioned. It appeared in connection with the published description of accepted brands and followed a preliminary report published in 1935. The longer period of abeyance in which this product was held is noteworthy.

The Council's continuous and, at present, increasing interest in matters of drug nomenclature is attested by the following reports appearing in this volume: Nonproprietary Synonym for Benzedrine and Benzedrine Sulfate (amphetamine and amphetamine sulfate); Sulfapyridine (the nonproprietary name); Questions of nomenclature were involved in the following reports of omission or rejection: Abbott's A-B-D Malt Extract with Cod Liver Oil and Viosterol Omitted from N. N. R.

(unwarranted implied claim for effect of vitamin B complex component); Nupercainal-"Ciba" Not Acceptable for N. N. R. (false implications concerning actual relationship to the accepted Nupercaine); Quinoliv Not Acceptable for N. N. R. (coined proprietary name for unoriginal mixture); Sedormid Not Acceptable for N. N. R. (therapeutically suggestive name); Fru-T-Lax Not Acceptable for N. N. R. (misleading and inadequately descriptive name). Of course, other objectionable features were concerned in the reasons for rejection but the question of nomenclature was given much weight in each consideration.

Attention should be called to the excellent status report on Ergonovine prepared for the Council by Dr. Ralph G. Smith. It will be recalled that Ergonovine is the nonproprietary name adopted by the Council for the new ergot alkaloid which had been given various names by various investigators. Dr. Smith's article is a compendious study of the new drug and its relation to ergot therapy. The Council's name, Ergonovine, appears to be in the process of being generally adopted.

Methoden der Virusforschung. Von Prof. Dr. Henrique da Rocha-Lima, Direktor des Staatl. Biologischen Instituts, São Paulo, Dr. José Reis und Dr. Karl Silberschmidt. Diese Abhandlung erscheint zugleich als Lieferung 480 in Abt. XII, Teil 2 des Abderhaldenschen Handbuchs der biologischen Arbeitsmethoden. Cloth. Price, 24.60 marks. Pp. 384, with 54 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1939.

This volume has an attractive format and contains excellent subject and author indexes. Almost half the text describes the technics of investigations of plant viruses; the remainder gives most of the procedures involved in studies on viruses derived from man and the lower animals, including those of the rickettsial diseases and pleuropneumonia bovum. At the end of each section are numerous references which add definite value. Of the authors, da Rocha-Lima has the respect and esteem of his colleagues for his original contributions to the subject of rickettsiae, particularly those associated with typhus fever, and Reis has studied avian and virus pathology. Silberschmidt is engaged in investigations on plant viruses, especially the study of the immunologic reactions of plants to infection. Within the last eleven years a number of comprehensive treatises dealing with the general aspects of viral agents and the diseases induced by them have been presented to the public. From the first, issued under the editorship of Rivers and of the British Medical Research Council, to those recently published under the direction of Levaditi and of Doerr, methods were described therein only as part of the subjects dealt with. In the present book a special contribution for the advanced student and investigator on virus technology is achieved for the first time. It is to be regretted that its contents are limited. With such limitation, omissions of certain established technics can occur. In the section on inclusion bodies, micro-incineration and the important subject of inclusions produced by nonviral materials are not considered; nor is mentioned, in the section on preparation of materials for animal inoculation, the value of broth as a diluent and suspending fluid or the use of centrifugation for clearing material from concurrent bacteria. Not all the routes of animal inoculation are given. Nor, in the section on determination of size, is the fact stressed that two important considerations are involved in obtaining correct end points: (1) infectivity of the virus in question and (2) its concentration. It would have been desirable, furthermore, to offer centrifugation as a means for recovering virus from neutral serum-virus mixtures and to give explicit procedures of serum-virus protection tests. However, the difficulty should be recognized of preparing a work such as this, on a subject which is so energetically studied, with such great progress. Although other omissions than those mentioned occur, the description of technics in the study of plant viruses, of ultrafiltration, of inclusion bodies and of tissue and embryonated egg cultivation are superior. What is stated in the text (including illustrations) has apparently been taken from original articles—a fact of utmost importance in creating a solid book. Descriptions of many of the most modern developments are included, such as purification of viruses by ultracentrifugation, stream double refraction, the Muench law, the electronmicroscope and light reactions. The present volume should prove of value to phytopathologists who are investigating viruses and should be useful in supplementing existing books on these agents.

William Alanson White: *The Autobiography of a Purpose.* By William A. White, M.D., A.M., Sc.D. With an introduction by Ray Lyman Wilbur. Cloth. Price, \$3. Pp. 293, with portrait. Garden City, New York: Doubleday, Doran & Company, Inc., 1938.

This is a stimulating and inspiring book which succeeds in being true to its subtitle, "The Autobiography of a Purpose". It is written in the first person with engaging candor and frankness. The author has apparently succeeded in taking an objective attitude toward his life, his personality and his purpose. There is no egotism in it nor any self deprecation.

After a preface and introduction in which he gives his reasons for writing the book, he divides his material into three parts. In the first of these he deals with the origin and early expressions of his purpose in life, including chapters on his first fifteen years, his college life, medical school and internship, the beginning of his career in psychiatry at the New York State Hospital at Binghamton and the beginning of his work at St. Elizabeth's Hospital, Washington. Part two deals with the building of St. Elizabeth's Hospital, the development of personnel, factors in administration, his correspondence, consultations, extramural activities, medicolegal experience and teaching. In this part are found chapters on the development of modern knowledge about dementia paralytica and the first use of malaria therapy in the United States. The closing chapter in this part deals with patients he knew and whom he designates characteristically as his friends.

Throughout the book one sees evidence of what must have been the chief characteristic of the author's personality, namely an insatiable interest in human beings and a broad and catholic sympathy for all mankind. His chapter on correspondence shows this universal human sympathy; he never failed to answer letters even from persons of obviously unsound mind. His medicolegal experience is characterized by a constant refusal, after one unsatisfactory incident, to testify for the prosecution on the ground that a doctor's business is to salvage human life and never to assist in its condemnation.

What may be regarded as the key to his life and to his philosophy is found near the end of the book (page 254) in his statement that "ideas are quite as real as chairs and tables and very often at least, if not always, very much more important." He places great emphasis on the modern psychiatric conception of the idea of the totality of the individual as opposed to distinctions between body and mind and he believes that the next great step forward in medicine will be along the line of further acceptance and development and the practical application of this concept.

The book is a valuable contribution both to professional and to popular literature in the field of mental hygiene and psychiatry. No layman can read it without a better understanding of the phenomena of mental disease and a broader and deeper sympathy with those unfortunates commonly known as "crazy people." No doctor can read it without being a better clinician and a wiser physician.

Die Grundlagen unserer Ernährung und unseres Stoffwechsels. Von Emil Abderhalden, o. ö. Professor der Physiologie und der physiologischen Chemie an der Martin Luther-Universität Halle a. S. Fourth edition. Paper. Price, 6 marks. Pp. 193. Berlin: Julius Springer, 1939.

This is an interesting account of the relation between plant and animal nutrition, the nature of the inorganic and organic nutrients, the chemical changes which occur in the intermediary metabolism of individual nutrients, the deficiency diseases, the nutritional significance of the milling of cereals, and the energy requirements of man for work. The author's well known facility as a writer insures an entertaining style. The brevity of the volume necessitated a superficial treatment of the great number of facts mentioned. There is no bibliography. Although the preface is dated January 1939, the book gives the impression that it was written at least two years ago and also that the author is not familiar with recent American researches in nutrition. For example, manganese is mentioned as occurring in the body and nothing is said of its physiologic role, which represents the major discovery of practical importance in poultry production in recent years. There is no mention of the anemia due to cobalt deficiency. Nicotinic acid in relation to pellagra is not mentioned. There are available in English several more timely books on nutrition.

The Diagnosis and Treatment of Diseases of the Thyroid. By James H. Means, M.D., Jackson Professor of Clinical Medicine, Harvard University, and Edward P. Richardson, M.D., John Homans Professor of Surgery, Harvard University, Boston. (Reprinted from Oxford Monographs on Diagnosis and Treatment.) Cloth. Price, \$5. Pp. 367, with 51 illustrations. New York, Toronto & London: Oxford University Press, 1938.

This volume is a series of monographs, each covering a particular phase of thyroid disease and each complete in itself. From the nature of this compilation there is much overlapping and repetition of material. As a whole, the book has given in an interesting manner a true description of goiter throughout the ages. The historical side of goiter and the part that each man has played in the development of our present knowledge is given in detail. The monograph on exophthalmic goiter is thorough. Every theory of the cause is described and criticized; every diagnostic measure is explained and evaluated; a rational understanding of the probable causes and principles of treatment is achieved. Detailed case histories of hospital patients, covering twenty-three years, are given to contrast the diagnosis and treatment at different periods. The book gives little space to cretinism and congenital hypothyroidism, which in some sections of the country are of greater importance than is indicated. These monographs were copyrighted in 1929 and few references to work done in the past ten years have been added.

Über die Wirkung von Erhöhung der Körpertemperatur auf den Kreislauf: Experimentelle Untersuchungen über die Kreislaufverhältnisse bei Erwärmung von Kaninchen mit besonderer Berücksichtigung der Blutdruckregulation. Inauguraldissertation. Von Rumar Brenning. Paper. Pp. 147, with 37 illustrations; Appendix, pp. 47. Uppsala: Almqvist & Wiksells Boktryckeri-A.-B., 1938.

This monograph reports numerous animal experiments, largely with rabbits, on the relationships and mechanisms of circulatory changes associated with elevated body temperatures. There are included many graphs and tabulations. The citations in the literature are more international than is usual with continental publications. Brenning seems to have evolved a rather complex and quite theoretical concept as to the mechanisms involved. The experimental data do not by any means prove his contentions; they merely suggest that his may be one of several possible theories to cover the facts. The factual portion of the work represents extensive and painstakingly careful studies. The monograph will be of special interest chiefly to investigators in the physiology of the circulation and thermoregulation. The clinical applications of the contentions are as yet remote.

Zur Epidemiologie der Kinderlähmung: Eine statistische Analyse. Von Birger Jönsson. Aeta Medica Scandinavica, Supplementum XCVIII. Paper. Pp. 193, with 13 illustrations. Stockholm: Esselte Aktiebolag, 1938.

This book contains an analysis of one epidemic of poliomyelitis which occurred during the years 1935-1937. They had 266 cases of paralysis, sixty-two abortive cases and 129 suspects. No epidemics had occurred in this area previous to 1935. Jönsson considers that the maximum of dissemination of poliomyelitis lies between the maximum of the intestinal diseases typhoid and dysentery on the one hand and contact diseases such as diphtheria and scarlet fever on the other hand. It was found that the disease did not follow the waterways but was most common in areas with the most crowded population.

Medical Microbiology. By Kenneth L. Burdon, Ph.D., Sc.M., Ph.D., Assistant Professor of Immunology and Bacteriology, Louisiana State University School of Medicine, New Orleans. Cloth. Price, \$4.50. Pp. 763 with 120 illustrations. New York: Macmillan Company, 1939.

This book is a revision and enlargement of the Textbook on Bacteriology by the same author. It was apparently written to suit the requirements of the author in his own classroom. Part I is devoted to the historical aspects and other phases of general bacteriology; part II gives brief instructions for laboratory routine; part III presents sources and modes of infection, with brief instructions for procedures in the operating room and the home; part IV deals with the microbiology of some of the more important communicable diseases. Five appendixes contain instructions for the preparation of culture mediums and stains and procedures for immunologic tests. Without doubt the book is satisfactory to the needs of the author, but the brevity of description in some cases is unfortunate. For instance,

the student is instructed to adjust Endo's medium to pH 7.4, but the method of making such an adjustment is omitted. In the chapter on germicides there are a number of rather broad statements concerning some of the commercial preparations, such as "IysoI is one of the most valuable disinfectants known" and "hexylresorcinol, a compound related chemically to phenol, and marketed in a mixture called S. T. 37, is an effective disinfectant." Phenol coefficients are omitted for all germicides mentioned, as are also the various methods of testing the efficiency of germicides.

Studien über hereditäre, multiple Epiphysenstörungen. Ar Sered Bihäng. Akademisk avhandling, för vinnande av medicine Doktorgrad. Upsala. Paper. Pp. 107, with 94 illustrations. Helsingfors, 1937.

The introduction contains a review of the literature of primary disturbances of ossification. This is detailed, covering general conditions such as achondroplasia and cretinism, to localized aseptic necroses, osteochondritis dissecans, osteochondritis deformans coxa (coxa plana) and kyphosis dorsalis juvenilis. The material of the study consists of hereditary anomalies, and the author describes the occurrence of congenital anomalies in six members of a large family. These anomalies are thoroughly studied and elaborately described. They involve multiple joint epiphyses, but especially the metacarpophalangeal articulations, knees, hips and vertebral bodies. The x-ray appearances, which he divides into two principal types, namely anatomic variations and anomalies on the one hand and destructive lesions similar to the osseous aseptic necroses on the other, are most elaborately presented. There are unfortunately no microscopic investigations to correlate with the clinical and x-ray studies. As a monograph on a rather circumscribed subject, built on a comparatively small clinical material, the book is carefully and painstakingly compiled and an interesting contribution to the rather dark field of primary epiphyseal growth disturbances.

Pulmonary Tuberculosis: A Synopsis. By Jacob Segal, M.D., Physician in Charge of Fordham Hospital Tuberculosis Clinic, New York. Foreword by the late Pol N. Coryllos, M.D., F.A.C.S. Cloth. Price, \$2.75. Pp. 150, with 21 illustrations. New York, Toronto & London: Oxford University Press, 1939.

This is a brief presentation on pulmonary tuberculosis. It contains numerous illustrations, mostly prepared from x-ray films of the chest. Approximately half a page is devoted to the first infection type of tuberculosis and the remainder of the book to reinfection clinical forms of the disease. Various phases of the examination for tuberculosis, such as the tuberculin test, symptoms, physical signs and x-ray films, are outlined. Under treatment such subjects as hygienic regimen, fresh air, diet, drugs and physical therapy are briefly discussed. The discussion of collapse therapy includes artificial pneumothorax, oleothorax, pneumonolysis, phrenicectomy and thoracoplasty. In approximately ten pages prevention is discussed, and considerable emphasis is placed on predisposing or contributing causes of tuberculosis, such as living in poorly ventilated and damp houses.

Heart Patients: Their Study and Care. By S. Calvin Smith, M.D., Sc.D. Cloth. Price, \$2. Pp. 166. Philadelphia: Lea & Febiger, 1939.

The author states that the purpose of this volume is to present with clarity and precision all that is useful in the older teachings on impairment of the heart and all that is practical in the maze of modern methods in investigation of the heart. This book is divided into twenty-two chapters dealing with the history and physical examination and the more important forms of cardiac disability. Chapters are also devoted to treating the heart patient rather than treating the heart, what heart patients wish to know and selecting nurses for heart patients. Many of the chapters fall far short of meeting the author's objective. Moreover, there are a number of statements pertaining to important subjects to which serious objections may be taken. Two examples will suffice. The first of these appears in the first paragraph pertaining to electrocardiography, on page 57: "In either indicting a heart or in establishing its innocence, while the patient furnishes testimony and the physician weighs the evidence, the case must be brought to trial in the court of first appeal—cardiography (electrocardiography). Cardiography is also the court of last resort in a differential diagnosis of heart

conditions." The second appears on page 119 in a discussion of the athlete's heart: "From a circulatory standpoint competitive athletics should absolutely be interdicted at schools and colleges. Struggles for supremacy are crippling to the hearts of youth."

Hereditary and Environmental Factors in the Causation of Manic-Depressive Psychoses and Dementia Praecox. By Horatio M. Pollock, Director of Mental Hygiene Statistics, New York State Department of Mental Hygiene, Benjamin Malzberg, Senior Statistician, New York State Department of Mental Hygiene, and Raymond G. Fuller, Director of Research, New York State Committee on Mental Hygiene of the State Charities Aid Association. Cloth. Price, \$2.50. Pp. 473. Utica, New York: State Hospitals Press, 1939.

This volume represents a study of the prehospital history of patients with manic-depressive psychoses and dementia praecox admitted for the first time to the Utica State Hospital in 1928, 1929 and 1930. There are eight chapters: the first deals with a review of studies of the inheritance of mental disease, the second with family stock of manic-depressive patients, the third with the query "Do mendelian laws apply to the inheritance of manic-depressive psychoses?" the fourth with family stock of dementia praecox patients, the fifth with comparative studies of the prevalence of mental disease among relatives of patients and among the general population, and the sixth and seventh chapters with environmental factors in both manic-depressive psychoses and dementia praecox. The eighth chapter contains a summary and conclusions. There is an excellent bibliography and index. One finds in this book a reasonable discussion of these two most important and common mental diseases. Many of the controversial questions are not answered by the authors, but they plead for more research so that in the end there may be an adequate conception of the causative factors in mental disease.

Elektrodiagnostik. Von Dr. B. Neoussikine und Dr. D. Abramowitzsch. Cloth. Price, 12 Swiss francs. Pp. 242, with 30 illustrations. Berne: Medizinischer Verlag Hans Huber, 1939.

This is a thorough discussion of electrodiagnosis. It is written in simple, clear and concise German. There are six chapters and one appendix with thirty illustrations. The first chapter deals with the principles of galvanic and faradic currents. The second part discusses the methods of electrical testing with both currents and chronaxia. The third and fourth chapters list the results of the electrical tests. Normal and pathologic chronaxia values are given for all muscles as well as the variabilities in complete or partial lesions of nerves. The fifth part deals with the use of electricity in examining sensation and sense organs, as the optic, vestibular and acoustic nerves. The sixth chapter discusses testing of the vegetative nervous system and the spinal reflexes. The appendix includes a brief consideration of the impedance angle, psychogalvanic reflex, electrocardiography, electromyography and electro-encephalography. The book is highly recommended to all neurologists, physiologists and physical therapists.

Intracranial Tumors of Infancy and Childhood. By Percival Bailey, Douglas N. Buchanan and Paul C. Bucy. Cloth. Price, \$5. Pp. 598, with 116 illustrations including 23 plates. Chicago: University of Chicago Press, 1939.

This is a needed and desirable monograph. It is the result of a study of an unselected series of 100 consecutive cases from infancy to the sixteenth birthday. All the cases were verified either by study of specimens removed at operation or at necropsy. It consists of fifteen chapters, a bibliography of 483 references, an author and subject index and excellent illustrations of gross specimens, ventriculographic studies and patients. Ependymomas, malignant and benign tumors of the cerebellum, gliomas of the brain stem, optic chiasm and hypothalamus, tumors of the cerebral hemispheres, craniopharyngiomas, tumors of the pineal body and miscellaneous tumors are discussed in detail. There are chapters on general pathology, symptomatology, differential diagnosis and technic and the results of treatment. There are excellent microscopic sections of the various tumors. The book should be read by every neurologist, neurosurgeon and neuropathologist because it will prove to be an excellent reference. It contains so much valuable information, suggestions and points that studying it is the only way to appreciate it.

Blood Group Tests as Evidence of Non-Paternity in Illegitimacy Cases. By Clyde E. Keeler, B.S., M.A., M.S., Instructor in the Howe Laboratory of the Harvard Medical School, Boston. Paper. No pagination. Boston: Robert C. True, Massachusetts Society for the Prevention of Cruelty to Children, 1939.

In this small pamphlet the principles underlying the application of the Landsteiner blood groups and M-N types in disputed parentage are outlined briefly and in elementary fashion. This will serve as an easy introduction to the subject. Unfortunately there are a number of mistakes. Thus the author seems to have the impression that the transfusion of blood from an individual of type M into an individual belonging to type N may give rise to iso-antibodies for M, so that subsequent transfusion of type M blood may be dangerous. Actually the formation of immune antibodies for M or N has never been observed, despite the fact that hundreds of thousands of transfusions are given every year.

Chronic Arthritis. By Robert T. Monroe, A.B., M.D., Associate in Medicine, Harvard University, Boston. Edited by Henry A. Christian, A.M., M.D., LL.D., Hersey Professor of the Theory and Practice of Physic, Harvard University, Boston. [Reprinted from Oxford Loose-Leaf Medicine.] Cloth. Price, \$2. Pp. 84. New York, London & Toronto: Oxford University Press, 1939.

The author of this small volume is an internist, and his book reveals a good sound fundamental knowledge of arthritis. Scientific presentation with adherence to facts and absence of enthusiasm and fads in therapy make this volume exceptionally valuable. Nothing new is added and nothing is omitted. It is written in a concise style and no useless material burdens the reader. Chronic arthritis is divided into three types, atrophic, hypertrophic and periarticular. These are discussed separately from the point of view of etiology, pathology, diagnosis and treatment. Here chronic arthritis is presented in complete form, and the student and physician will find the answers to their problems if they can be answered.

Man and His Health: A Guide to Medical and Public Health Exhibits at the New York World's Fair 1939, Together with Information on the Conservation of Health and the Preservation of Life. Published for the American Museum of Health, Inc. Boards. Price, 50 cents. Pp. 96, with illustrations. New York: Exposition Pub'ns., Inc., 1939.

This is a brief description, with illustrations, of the exhibits in the Hall of Medicine and Public Health at the New York World's Fair. In the Hall of Man is presented a large amount of material on anatomy and physiology from the Oberlander Trust. In the Hall of Medical Science there are twenty-eight exhibits, presented by various scientific and commercial organizations. Brief mention is made of health exhibits found in other parts of the fair, such as the Federal Building and various state and foreign buildings.

A Textbook of Clinical Neurology with an Introduction to the History of Neurology. By Israel S. Wechsler, M.D., Professor of Clinical Neurology, Columbia University, New York. Fourth edition. Cloth. Price, \$7. Pp. 844, with 162 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

This edition contains many additions as well as an introduction to the history of neurology. The latter is a valuable adjunct. Neuritis is regarded as a neuropathy, in a rewritten chapter. The olfactory tests of Elsberg, the carotid sinus syndrome, petrositis, the premotor syndrome and electro-encephalography are included in this edition. There are five parts, on method of examination, the spinal cord, the peripheral nerves, the brain and the neuroses. This book is highly recommended to students and general practitioners.

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and Other Matters Connected with the Work of House Surgeons and of Surgical Dressers. Edited by Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London. Eleventh edition. Cloth. Price, \$6. Pp. 512, with 362 illustrations. Baltimore: William Wood & Company, 1939.

The author has brought down to date one of the most complete single volumes on general surgery and has presented it as a guide to house surgeons. Each subject is dealt with in a concise but thorough manner which makes it enjoyable. The chapter on pulmonary complications is especially well presented. Each procedure discussed in a given technic is presented in detail, so that one unfamiliar with the technic can easily follow the steps.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Indorsement of Licenses of Foreign Licentiates; Board's Right to Require Examination of All Foreign Applicants.—The Education Law of New York authorizes the board of regents to indorse a license issued by a legally constituted board of examiners in any other state or country on satisfactory evidence that the requirements for the issuance of such license were "substantially the equivalent" of the requirements in force in New York when such license was issued and that the applicant has been in the lawful and reputable practice of his profession for a period of not less than five years prior to his making application for such indorsement. When the evidence presented is not satisfyingly sufficient to warrant the indorsement of such license, the board is authorized to require that the candidate for indorsement shall pass such subjects of the licensing examination specified by statute or regents' rule as should be required of the candidate to establish his worthiness to receive such indorsement.

Sept. 21, 1936, the Board of Regents of New York adopted the following rule:

"That on applications filed after October 15, 1936, no license issued by a legally constituted board of examiners in any foreign country shall be indorsed pursuant to the provisions of Section 51 of the Education Law, unless the applicant shall pass the licensing examination prescribed by law or Regents rule."

The petitioners in these cases had licenses authorizing them to practice medicine in Germany. In 1937 they applied for and passed in the state of New York the examination in English required of foreign applicants. Both then applied for admission to the January 1938 medical licensing examination, one petitioner reserving any rights he might possess under the New York laws regulating the practice of medicine, but both failed to pass the examination. The petitioners then applied to the board of regents for an indorsement of their German licenses, the board denied the request and the petitioners, in a proceeding instituted in the supreme court of New York, special term, Albany County, sought to compel the board to act favorably on their applications. They contended that the board's rule, promulgated in 1936 and requiring examinations of all foreign applicants, was invalid because the law required an examination of a foreign licentiate only when the evidence of his qualifications was not satisfyingly sufficient and that the evidence of their qualification was sufficient to entitle them to an indorsement of their German licenses.

In the opinion of the court, the rule adopted by the board, however well intentioned, directly contravened the statute. The latter authorizes the indorsement of a foreign license on proof of substantially equivalent requirements and a specified period of practice in the foreign country. The rule permits of no such indorsement but requires every foreign applicant to stand examination. In this respect the board transcended its power; it may not legally set a standard more restrictive than the statute. The exhibits submitted by the petitioners, the court thought, gave prima facie force to their contention that their qualifications were sufficient and an order was issued directing the trial of the issue as to whether the petitioners had actually produced evidence satisfyingly sufficient to entitle them to indorsement of their licenses. From this order the board appealed to the supreme court of New York, appellate division, third department.

As viewed by the appellate division, the sole issue to be determined was not whether the board had exceeded its powers in promulgating the rule in question but whether or not the action of the board in denying the petitioners' applications for indorsements of their foreign licenses was arbitrary, unfair, or capricious. The record before the court did not convince it that the board had rejected the petitioners' applications because of the rule adopted in 1936 but because it had appraised the

evidence of qualifications submitted by the petitioners and had found it wanting. The obvious purpose of the statute, the court said, was to permit the board to indorse a license issued by the licensing board of another state or country in those cases in which the applicant is unable to meet the letter of the requirements of the New York statute but possesses essentially the same or equivalent qualifications. The power granted to the board is a limited one, remedial in its nature, and must be exercised with caution and with due regard to the statutes regulating the practice of medicine in New York. The board may not through the exercise of the power granted by the law indiscriminately indorse foreign medical licenses. Before it may legally indorse such a license it should be satisfied that the applicant has met substantially all requirements. If it errs at all, it should be on the side of the protection of the public from unworthy and inefficient practitioners.

The burden of proving his qualifications is on the applicant. He must not only prove that he graduated from certain institutions but he must also prove to the satisfaction of the board that these institutions are substantially the equivalent of the New York schools. He must not only prove that he has a foreign license but he must also prove to the satisfaction of the board that the requirements for that license were substantially the same as in New York. The petitioners failed to offer such proof. In the Erlanger petition, it was asserted that he began the study of medicine in 1912 and continued it at various German universities until October 1914. It was alleged that he continued his studies after the war and received his diploma and German medical license in July 1922. In the Levi petition, it was alleged that at the beginning of the World War he had completed sufficient medical courses in German universities to serve as an assistant physician and that he did serve as such in various hospitals until the end of the war and that he received his medical license on June 10, 1919. None of the institutions from which the petitioners graduated, the court pointed out, had ever been registered by the board or by the department of education as maintaining proper medical standards. In neither petition was there any allegation that the German standards at the time the petitioners received their licenses were substantially the same as those existing in the state of New York. There was no proof whatever as to the equality of the German institutions, including faculty, length of courses of study, curriculum or equipment. There was no proof that the petitioners ever passed an examination for their licenses as required in New York. What little evidence there was before the board, in the opinion of the court, indicated that the standard of the German schools was lower than the standards in New York and that the requirements for a German license were far from being essentially the same as those in New York.

The petitioners asserted that many other German physicians had been admitted to practice medicine in New York by the board since 1917 by indorsement of their certificates, but the court thought this point to be without merit. What the board may have done in the past was immaterial; the court was concerned only with its action in the cases before it.

To sustain the contention of the petitioners, the court observed, would mean that any foreigner who can speak our language and who has been licensed to practice in a foreign country and who actually practiced there for a period of five years could, on the moment of his arrival at the port of New York, demand the issuance of a license to him to practice his profession in the state. The legislature never had any such intention. Our own citizens, the court pointed out, must pursue a rigorous course of study and supply evidence of good character in order to practice medicine and yet, if the petitioners were correct, any foreigner who was authorized to practice medicine in his native land could come into the state of New York and be immune from such requirements. There was not the slightest bit of proof before the court to indicate that the action of the board of regents constituted an unlawful and arbitrary exercise of power. The orders of the trial court directing the trial of the issue as to whether the petitioners produced evidence satisfyingly sufficient to come within the statute were therefore reversed.

Petitioner Levi then appealed to the Court of Appeals of New York, which in a memorandum decision affirmed the judgment of the appellate division.—*Levi v. Regents of the University of State of New York et al.*; *Erlanger v. Samc*, 8 N. Y. S. (2d) 19; 10 N. Y. S. (2d) 1013; 22 N. E. (2d) 178.

Narcotic Drug Act (Illinois): Information Must Allege Marihuana Is Cannabis Within Meaning of Statute; Court Will Not Take Judicial Notice of Its Composition.—The defendant was convicted in the municipal court of Chicago on an information charging the unlawful possession of a habit-forming drug; to wit, marihuana. The conviction was upheld by the appellate court for the first district and the defendant thereupon appealed to the Supreme Court of Illinois. In the trial court, in the appellate court and in the Supreme Court the defendant contended that the information under which she was convicted failed to charge any criminal offense.

The narcotic drug act of Illinois, 1935, Ill. Rev. Stat. 1937, Ch. 38, makes it unlawful for any person to possess any narcotic drug except as authorized by the act. It defines the term "narcotic drugs" as including cannabis. The term "cannabis" is defined so as to include "the following substances under whatever names they may be designated: (a) The dried flowering or fruiting tops of the pistillate plant *Cannabis Sativa* L., [Linné] from which the resin has not been extracted, (b) the resin extracted from such tops, and (c) every compound, manufacture, salt, derivative, mixture, or preparation of such resin, or of such tops from which the resin has not been extracted." The act makes no specific reference to "marihuana." The prosecution claimed, however, that the word "marihuana" is defined in all standard dictionaries as a narcotic drug of the cannabis family, that it is so well known that the court should take judicial notice of its meaning and that marihuana is therefore included in the narcotic drug act of 1935.

It is to be observed, commented the court, that while the word "marihuana" was included in the narcotic drug act of 1931, it is not in the act of 1935 under which this prosecution was brought. The narcotic drugs embraced in the act of 1935 are specifically defined in it. Even if it is conceded that marihuana is *Cannabis sativa* L., it is obvious that, if the possession of marihuana constitutes an offense under the act, it must be charged that the marihuana alleged to have been unlawfully possessed was from the dried flowering or fruiting tops of the plant named in the act and that the resin had not been extracted. The possession of marihuana is not a criminal offense unless it is of the specific quality and kind defined in the statute. No charge that the marihuana possessed by the defendant in this case was of that specific quality and kind is contained in the information. The information, therefore, did not charge the defendant with any offense known to the law.

The judgment of the courts below were reversed by the Supreme Court and the cause remanded with directions to proceed in accordance with this decision.—*People v. Sowerd* (Ill.), 18 N. E. (2d) 176.

Dental Practice Acts: Validity of Provisions Authorizing Revocation of License for Advertising.—The New Jersey dental practice act authorizes the revocation of the license of any dentist who advertises in any manner his product or the price or charge to be made or the character or durability of his works or products. On proof that Levine had transgressed the statute in this respect the New Jersey State Board of Registration and Examination in Dentistry revoked his license to practice dentistry. Levine then instituted certiorari proceedings before the supreme court of New Jersey. He contended that the provision of the dental practice act just cited is an improper exercise of the police power of the state and is unconstitutional; that it erects a wall of silence behind which monopoly and high prices could flourish, and that the advertisement that he had published respecting the prices charged by him for dental work and the character and durability of his work was true, and, finally, that the provision referred to interferes with his right of free speech in the conduct of his business.

On the authority of *Semler v. Oregon State Board of Dental Examiners*, 294 U. S. 608, 55 S. Ct. 570, 79 L. Ed. 1086, in which the Supreme Court of the United States upheld the constitutionality of a provision of the Oregon dental practice act

authorizing the revocation of the license of a dentist for advertising prices for professional services, the supreme court of New Jersey thought that it was clear that the legislature in authorizing the revocation or suspension for this sort of advertising adopted a measure necessary to protect the public from the wiles and artifices of the charlatan. The truth or falsity of the dentist's assertions, said the court, is of no importance. It is possible that everything that a dentist may say in an advertisement is the literal truth, but if this sort of advertising affords the unscrupulous practitioner an opportunity to practice a deception on his patients, then there is reason why the legislature should authorize the suspension or revocation of the licenses of those who so advertise. The issue before the state board in suspending Levine's license on the charges made was simply whether he had resorted to the prohibited practices, and it was not necessary for it to investigate the truth or falsity of his advertisements, since they admittedly offended against the legislative concept of proper dental practice. To urge that an individual licensed by the state to practice a skilled profession may not be precluded by the state from advertising the price to be charged for his work and the durability thereof is tantamount to urging that the state may not make regulations which will preclude charlatans from enticing the public to their offices by arts which are likely to deceive, and that those engaged in practicing a profession requiring skill and knowledge may not be required to conform to a standard of practice which the people by their representatives deem necessary for their protection.

The supreme court, accordingly, in effect, affirmed the order of the board revoking Levine's license.—*Levine v. State Board of Registration and Examination in Dentistry* (N. J.), 1 A. (2d) 876.

Evidence: Admissibility of Expert Testimony Based on Statements Made by Patient to Expert.—On Sept. 24, 1933, the plaintiff jumped from a speeding automobile, fell on a concrete pavement and was knocked unconscious. Twenty-eight days later, on October 22, she was riding as a passenger in the defendant company's street car when it was struck by a train. She sued the defendant company to recover damages for injuries which she claimed she sustained as a result of the street car accident. From a judgment in favor of the plaintiff, the company appealed to the Supreme Court of Missouri, division No. 1.

An expert medical witness for the plaintiff testified that, based on his own examination and on the history of the case as given to him by the plaintiff, the disturbance of function of the plaintiff's bladder which he found at the time of his examination of the plaintiff in June 1934 was due to a spinal concussion which she had received at the time of the street car accident. The witness admitted that, while he had been told by the plaintiff of the prior automobile accident, he had not been informed that after that accident she had remained in a hospital for ten days because of her injuries, that her reflexes were sluggish, that she complained of pain in her abdomen and that she had paralysis of her bladder necessitating catheterization. He stated that from the history which he had obtained from the plaintiff it was his understanding that she had recovered from the injuries she received in the automobile accident and was well when the street car accident occurred.

The testimony of this witness, the Supreme Court held, was not competent evidence and should not have been admitted. It was based on the history of the physical condition of the plaintiff as told to the witness by the plaintiff herself. The plaintiff did not confine her statements to her physical complaints and ailments as of the time of the examination by the witness. She informed him of her alleged recovery from previous injuries which she had sustained, but she did not reveal the physical injuries and complaints she suffered as the result of that accident. A medical expert witness, said the court, may give in evidence his opinion of the condition of a patient based on his examination of the patient or on the patient's statements as to present symptoms or physical condition or on both such examination and statements. He may not, however, base his opinion on the patient's statements as to past physical condition. The admission in evidence by the trial court of the medical expert witness's testimony was reversible error. The judgment of the trial court was reversed and the case remanded for a new trial.—*Berry v. Kansas City Public Service Co. (Mo.)*, 121 S. W. (2d) 825.

Workmen's Compensation Acts: Compensability of Cerebral Thrombosis Due to Exertion.—The claimant, Uditsky, while engaged in grinding and beveling glass in the shop of the defendant, Krakovitz, exerted himself to prevent a slipping heavy piece of glass from falling. As he did so he experienced a sensation "like a fire" in his head and over his face and also numbness of his left hand. Thereafter he was unable to work. Later his left hand and the left side of his body became paralyzed. His condition was diagnosed as polycythemia vera (a condition characterized by an increase in the number of red blood corpuscles) and cerebral thrombosis with hemiplegia. He filed a claim with the workmen's compensation board for compensation under the workmen's compensation act of Pennsylvania. The board denied him compensation for permanent total disability but awarded him compensation for the loss of the use of his left arm. From a judgment of the court of common pleas No. 6, Philadelphia County, affirming the board's award, the defendant appealed to the superior court of Pennsylvania.

The claimant's claim, said the superior court, was supported by the testimony of two physicians that his condition had been caused by the extreme effort he exerted in saving the slipping glass from falling. In the judgment of the court, therefore, the evidence justified the finding of the workmen's compensation board, on which it based its award that the claimant's condition resulted from an accident in the course of his employment. Accordingly, the judgment of the court of common pleas upholding the board's award was affirmed.—*Uditsky v. Krakovitz (Pa.)*, 2 A. (2d) 525.

Evidence: Testimony of X-Ray Technician in Interpreting Roentgenograms Admissible.—In a personal injury suit a witness was shown to be in charge of the x-ray and laboratory department of a certain hospital "as an x-ray technician who reads and interprets x-rays for the medical staff of that institution" and to have had fifteen years of experience in reading and interpreting roentgenograms. The trial court then permitted the witness to testify that certain roentgenograms disclosed fractures of the vertebrae of the subject but refused to permit the witness "to express an opinion as to whether the fractures were due to trauma or injury." On an appeal to the Supreme Court of Mississippi, division B, it was contended that the testimony of this witness was not competent because he was not a physician and surgeon and because he had never taken a course in anatomy. The witness, said the Supreme Court, was competent to testify as to what the roentgenograms disclosed because his training and experience should have qualified him so to testify. The fact that a witness is a physician and surgeon would not be the best test of competency in this regard, since it is conceded that many medical practitioners are unable to read and interpret roentgenograms. The experience of an x-ray technician in observing the effect of known fractures, as reflected in the pictures thereof, over a period of years, should peculiarly qualify him to state the facts thereby disclosed, although he would not be competent to express an opinion as to what caused the condition showed.—*Aponaug Mfg. Co. v. Carroll (Miss.)*, 184 So. 63.

Medical Practice Acts: Chiropractic as the Practice of Medicine.—A complaint was filed in the city magistrates' court of New York, tenth district, Borough of Brooklyn, charging that Zinke, an unlicensed chiropractor, unlawfully engaged in the practice of medicine and unlawfully used a designation tending to imply or designate himself as a practitioner of medicine. The chiropractor moved for a dismissal of the complaint, contending that it did not charge that he held himself out to be able to diagnose, treat, operate or prescribe for any human disease, pain, injury, deformity or physical condition.

The court found, however, that there was directly and by inference a holding out by the defendant that he was able to perform one or more of the prohibited acts. He displayed certificates bearing his name as a "Doctor of Chiropractic" and signs bearing his name as a "chiropractor." He also caused himself to be listed in the telephone directory as a chiropractor. These signs and certificates, the court pointed out, were presumptive evidence of a holding out within the meaning of the

medical practice act. The titles "Doctor" and "chiropractor" carried with them definite implication that the possessor of those titles was able to treat bodily conditions. Furthermore, the setup of the defendant's office, attendant, dressing rooms and split-back robes, neurocalometer and articulated table, constituted equipment of one who uses it as preliminary to and in the actual treatment of physical conditions. When the defendant took the histories of his patients and subsequently treated them and accepted compensation, there arose an inference of a holding out.

Furthermore, the court continued, the defendant diagnosed. His history taking, examination with the use of a neurocalometer and his statements as to the causes of conditions of his patients showed that he made a determination which he deemed sufficient for the purpose of treatment. The term diagnosis, in modern terminology, is a "sizing up" or a comprehending of the physical or mental status of a patient. It is the conclusion itself rather than the procedures on which the conclusion is based which constitutes a diagnosis per se. No particular language need be used and no disease need be mentioned, for the diagnostician may make or draw his conclusion in his own way. The defendant also undertook and offered to treat. The definition of the practice of medicine in New York states that the treatment may be by "any means or method." The defendant's method was by manipulation of the spine.

The court expressed itself as not concerned with whether chiropractic treatments are beneficial or injurious. The only question for determination was whether the facts stated in the complaint showed that the defendant had violated the law. The court was of the opinion that they did and the motion to dismiss the complaint was overruled.—*People v. Zinke (N. Y.)*, 7 N. Y. S. (2d) 941.

Life Insurance: Admissibility of Hospital Records in Evidence.—A Pennsylvania statute prohibits physicians from divulging in civil cases communications made to them by their patients which tend to blacken the character of the patient. In an action on a life insurance policy, the superior court of Pennsylvania held that hospital records, showing that the insured had been treated for chronic alcoholism and delirium tremens, were not inadmissible under this statute. The proscription is restricted to "communications" made by the patient to the physician which tend "to blacken his character." It does not extend to information obtained by the physician from his personal examination. In the judgment of the court, the evidence objected to was either not a "communication" made by a patient to his physician or it did not tend to "blacken" the patient's character.—*Soltaniuk v. Metropolitan Life Ins. Co. (Pa.)* 2 A. (2d) 501.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Central Association of Obstetricians and Gynecologists, Iowa City, Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.
- Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. I. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
- New York State Association of Public Health Laboratories, Albany, Nov. 3. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. F. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Allen Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Southwestern Medical Association, El Paso, Texas, Nov. 9-11. Dr. M. F. Spearman, 1001 First National Bank Bldg., El Paso, Texas, Secretary.
- Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

36: 527-700 (Aug.) 1939

- *Blue Nevus (Jadassohn-Tièche): Its Distinction from Ordinary Moles and Malignant Melanomas. H. Montgomery and J. E. Kahler, Rochester, Minn.—p. 527.
- Neoplasm Studies: VI. Granulocytic Accumulation Following In Vivo Röntgen Irradiation of Mouse Sarcoma 180. C. G. Grand, New York.—p. 540.
- Observations on Rats Treated with Sex Hormones, Estrin and Testosterone. C. S. McEuen, Montreal.—p. 551.
- Pulmonary Asbestosis: V. Report of Bronchial Carcinoma and Epithelial Metaplasia. K. M. Lynch and W. A. Smith, Charleston, S. C.—p. 567.
- Early Carcinoma of Ampulla of Vater. J. Foldes and F. W. Heyer, Nanticoke, Pa.—p. 574.
- Transferable Liver Neoplasm (C198) Arising in Female Mouse of Leaden Strain. A. M. Cloudman, Bar Harbor, Maine.—p. 578.
- Cytology of Tumor Cell in Rous Chicken Sarcoma. M. Levine, New York.—p. 581.
- Respiratory Changes in Vitro in Normal and Malignant Tissues Following Irradiation. Anna Goldfeder, New York.—p. 603.
- Sterol Metabolism in Tumor Mice. F. L. Breusch, Szeged, Hungary.—p. 609.

Blue Nevus, Moles and Melanomas.—Montgomery and Kahler state that the blue nevus has been confused with the Mongolian spot. The latter is usually a solitary plaque from 2 to 12 cm. in diameter occurring on the back, usually near the sacrum. It may be brown rather than blue. It is seen most frequently in the Mongolian race but also occurs in the Caucasian. The pigmented area is poorly defined; it is not elevated or indurated. It is usually present at birth and, as a rule, disappears within the first few years. Occasionally multiple plaques are seen scattered over the body and solitary Mongolian spots have been described elsewhere than on the back. The cells in the Mongolian spot are histologically nearly identical in appearance with the blue nevus cells but are relatively few in number and occur singly rather than in clumps or in masses. There is no disturbance in the normal architecture of the connective tissue and elastic tissue fibers. The blue nevus occurring in infancy or early childhood also must be differentiated from ordinary pigmented nevi, dermatofibroma with hemorrhage (histiocytoma), small deeply situated hemangioma and finally malignant melanoma. The blue to blue-gray usually distinguishes the blue nevus, on clinical grounds alone, from the ordinary brown to brownish-black pigmented nevus. In typical cases the nevus cells in the two conditions present entirely different morphologic features. Dermatofibroma is occasionally blue, especially when deposits of hemosiderin are to be found histologically. A few chromatophores laden with pigment may be seen, but no elongated fusiform melanoblasts (blue nevus cells) are present. A small deep hemangioma may be blue, but it is soft to palpation and blood is obtained on puncture of the lesion. In a few cases blue nevus may simulate the steel blue color of an early malignant melanom-epithelioma in which radiating lines of pigment in the lymphatics have not yet developed. A wide surgical excision is indicated in these cases. The histologic picture is confusing only when the cells of melano-epithelioma elongate into spindle shaped cells frequently containing much pigment. These cells, however, also have an increased amount of cytoplasm and their nuclei are hyperchromatic and frequently contain mitotic figures, three characters which are not seen in blue nevus cells. It is the authors' belief that if blue nevi are looked for they will be found much more frequently than the literature would indicate. Blue nevus rarely shows malignant change. When this occurs it would seem to be that of a relatively slow-growing

melanosarcoma. Like ordinary pigmented nevi, the blue nevus usually runs a benign course and there is no need for surgical excision unless for cosmetic purposes or when the lesion is situated in an area exposed to repeated trauma, friction or irritation.

American Journal of Psychiatry, New York

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- *Age of Onset of Epilepsy: Differences Between Deteriorated and Non-deteriorated Patients. H. A. Paskind and M. Brown, Chicago.—p. 59.
- *Frequency of Seizures in Epilepsy: Differences Between Deteriorated and Nondeteriorated Patients. H. A. Paskind and M. Brown, Chicago.—p. 65.
- Cell Minerals in Amaurotic Idiocy, Tuberculous Sclerosis and Related Conditions, Studied by Micro-Incineration and Spectroscopy: Examples of Degenerative and of Neoplastic Cell Disease. L. Alexander and A. Myerson, Boston.—p. 77.
- Psychogenic Factors in Asthma. T. M. French, Chicago.—p. 87.
- Cerebral Damage in Hypoglycemia: Review. A. B. Baker, Minneapolis.—p. 109.
- Psychiatric Disorders in Fifty School Teachers. J. H. Wall, White Plains, N. Y.—p. 137.
- Life Situation Tests as Aids in Psychiatric Prognosis. A. A. Low, H. D. Singer and Catherine L. McCorry, Chicago.—p. 147.
- Convulsive States with Evidence of Brain Hemiatrophy. L. Casamajor and R. W. Laidlaw, New York.—p. 165.
- Involuntary Eye Movements as Criterion of Depth of Insulin Coma. H. Brill and R. F. Binzley, Brentwood, N. Y.—p. 177.
- Anomalies and Dangers in Metrazol Therapy of Schizophrenia. L. E. Geeslin and H. Cleckley, Augusta, Ga.—p. 183.
- Metrazol Shock Treatment: Pharmacologic and Biochemical Studies. F. C. Redlich, Independence, Iowa.—p. 193.

Seizures in Deteriorated and Nondeteriorated Epilepsy.—Paskind and Brown report studies on the age of onset of the epilepsy in a group of nondeteriorated, well adjusted, non-psychotic nonfeebleminded extramural persons with epilepsy. Their material consists of the records of 368 adult nondeteriorated patients with epilepsy. In order to allow sufficient time for deterioration to occur, no patient was accepted for this study unless seizures were present for at least six years. Patients with defective mental development and with focal signs of neurologic disorder were not accepted for this study. A comparison of the age of onset of these nondeteriorated patients with that of institutional, deteriorated patients revealed that: 1. Fewer nondeteriorated patients have the onset before 5 years of age. 2. Fewer nondeteriorated patients have the onset before 10 years of age. 3. More nondeteriorated patients have the onset after 20 years of age. 4. More nondeteriorated patients have the onset after 40 years of age. It is concluded that deteriorated patients with epilepsy differ from the nondeteriorated ones in that there is a tendency to later onset in the non-deteriorated patients. The material which the authors used for the studies on the frequency of seizures consists of the records of 317 adult nondeteriorated extramural patients with epilepsy. No patient was accepted for this study unless he had had seizures for at least six years. Patients with defective mental development and with focal signs of neurologic disorder were not accepted for this study. The seizures studied were of patients who had had no treatment or only inadequate, irregular treatment. Comparing the frequency of major seizures in their series of nondeteriorated patients with the frequency of such seizures in deteriorated institutional patients, the authors say that in their series 5.7 per cent had grand mal seizures at intervals of less than a day. This ratio is much smaller than that given in other reports, in which comparative figures vary between 10.9 and 20.4 per cent. In 14.5 per cent of the present series of patients, major seizures occurred at intervals of a week or less. This figure again contrasts markedly with other reports in which the comparative figures vary between 18.3 and 56 per cent. In 52.1 per cent of the patients of the present series grand mal seizures occurred at intervals of one month or less. Comparative figures in other statistics are between 54.7 and 90.3 per cent. The percentage of patients in whom the major seizures occurred at intervals of greater than one month was 47.9 in the material investigated. This figure is greater than that given by any other writer. Thus it appears that extramural, nondeteriorated patients have major seizures less frequently than do the deteriorated patients in institutions. A search of the literature revealed only one statistical statement regarding the frequency of petit mal attacks; Gowers stated that in half the cases the attacks occurred daily. In the material analyzed by the authors the frequency of petit mal attacks could

be determined in 137 cases. They occurred at intervals not exceeding one day in 21.2 per cent of cases. In the conclusion the authors emphasize once more that in noninstitutional, non-deteriorated patients with epilepsy, seizures are significantly less frequent than they are in deteriorated institutional patients.

Annals of Internal Medicine, Lancaster, Pa.

13: 225-384 (Aug.) 1939

- Nicotinic Acid in Nutrition. C. A. Elvehjem, Madison, Wis.—p. 225.
Observations on Experimental Use of Sulfapyridine: I. Relation of Strain Resistance to Chemotherapeutic Effects of Sulfapyridine in Experimental Pneumococcal Infections in Mice. P. H. Long and Eleanor A. Bliss, Baltimore.—p. 232.
Epidemic Syphilis, Its Recognition and Management by the Physician. E. G. Clark, Nashville, Tenn.—p. 238.
Anaphylaxis and Allergy. C. A. Dragstedt, Chicago.—p. 248.
Value and Significance of Tuberculin Test. A. J. Logie, Jacksonville, Fla.—p. 255.
*Relative Value of Basal Metabolic Rate, Velocity of Blood Flow and Creatine Tolerance Test in Differential Diagnosis of Graves' Disease and Allied Conditions. F. H. King and A. R. Sohval, New York.—p. 261.
Electrocardiographic Findings Following Carotid Sinus Stimulation. W. K. Purks, Vicksburg, Miss.—p. 270.
Subacute Bacterial Endocarditis Due to *Streptococcus Viridans*, with Special Reference to Prognosis. J. A. Capps, Chicago.—p. 280.
*Role of Upper Small Intestine in Control of Gastric Secretion: Effect of Neutral Fat, Fatty Acid and Soaps; Phase of Gastric Secretion Influenced and Relative Importance of Psychic and Chemical Phases. H. Shay, J. Gershon-Cohen and S. S. Fels, Philadelphia.—p. 294.
*Observations on Specific Treatment (Type A Antiserum) of Staphylococcal Septicemia. L. A. Julianelle, St. Louis.—p. 308.
Benign and Malignant Gastric Ulcers: Their Relation and Clinical Differentiation. W. L. Palmer, Chicago.—p. 317.
Postgraduate Portion of Medical Education. C. S. Burwell, Boston.—p. 339.

Differential Diagnosis of Exophthalmic Goiter.—King and Sohval say that whereas typical cases of exophthalmic goiter present no difficulty in the diagnosis, borderline cases, in which the symptomatology is not so clearly delineated, are not so easy to differentiate on clinical grounds. Efforts have been made by previous workers to find some objective laboratory tests which would simplify the differentiation of such conditions as autonomic imbalance, the menopause, hypertension and non-toxic goiter from true exophthalmic goiter. In this study King and Sohval investigated the comparative value of the determination of the basal metabolic rate, the creatine tolerance and the velocity of the blood flow. These tests were made in a group of eighty-seven cases comprising seventeen of exophthalmic goiter and seventy of borderline and allied disorders. Regarding their experience with the determination of the basal metabolic rate, the authors say that the basal metabolic rate is uniformly elevated in exophthalmic goiter and is reduced by the administration of iodine and by subtotal thyroidectomy. In the borderline and allied cases, initial determinations are frequently elevated and misleading. At times repeated determinations are necessary before the true basal rate is obtained. Especially does this hold in cases of autonomic imbalance. In some instances the authors succeeded in obtaining an accurate (normal) figure only after hospitalization. An elevated figure obtained in a random determination of the basal metabolism of an ambulatory patient is wholly unreliable. The determination of the velocity of blood flow as measured by the saccharin method in terms of arm to tongue circulation time has not been used as an adjuvant in the clinical diagnosis of exophthalmic goiter. Since, according to investigations, the velocity of the blood flow is roughly in direct proportion to the basal metabolic rate, the authors decided to determine it in their cases. They measured the circulation time by the interval elapsing between the injection of saccharin into the antecubital vein and the perception of the sweet taste in the tongue. One hundred and sixty-seven determinations were made in eighty-eight cases. The authors found that the determination of the circulation time fails to afford a laboratory aid in the differential diagnosis between exophthalmic goiter and the borderline cases, since the differences are not clearcut enough and there is considerable overlapping of figures. Their experience with the creatine tolerance test discloses that it is also limited in its usefulness and may give discordant results. Laboratory aids in general are inadequate as absolute criteria in the differential diagnosis between exophthalmic goiter and the borderline cases which simulate it. However, the determination of the basal metabolic rate excels the circulation time test and the creatine tolerance test in usefulness. In the last

analysis, clinical judgment surpasses in value any of these laboratory aids. The latter should assume a secondary role and be employed with distinct knowledge of their limitations and shortcomings.

Upper Small Intestine and Gastric Secretion.—Shay and his associates studied the effect on gastric secretion of neutral fat, fatty acid and soap in the upper intestine, the phase of secretion influenced from the intestine and the relative importance of the psychic and chemical phases of gastric secretion. They selected eight patients with a normal or high gastric acid response to the Ewald meal and with no demonstrable organic gastrointestinal disease. In order to satisfy any questions that might be raised regarding the chemical effect of zwieback and water as the test meal, numerous studies were done with 200 cc. of 2 per cent Liebig's extract as the gastric meal. The change in gastric secretion produced by duodenal stimulation was independent of the type of mouth meal used. After an overnight fast two Rehffuss tubes were introduced into the stomach. One was passed into the duodenum by the usual technic, whereas the other remained in the stomach. When the duodenum was intubated, the positions of the tubes were determined fluoroscopically. The fasting gastric contents were removed and the test meal was administered by mouth. The Ewald meal consisted of 30 Gm. of zwieback and 300 cc. of distilled water at body temperature. Duodenal instillation of the test substances in the separate studies was begun with the mouth meal, except when the effect of a time lapse in their administration was being studied. The effect on gastric secretion of the additional tube through the pylorus was investigated. As previously reported, a tube so placed did not influence gastric emptying; under similar conditions it failed to modify gastric secretion. The studies reported by the authors demonstrated consistent marked depressions of gastric secretion in man when neutral fats, fatty acids and soaps in proper concentrations were instilled into the duodenum simultaneously with the mouth meal. All secretory fractions were involved: acid, chloride and enzymes. This depression of secretion continued for a considerable period after the instillation of the stimulant was stopped. A secondary sharp rise in gastric secretion was nearly always observed after the duodenal stimulating effect was overcome. The authors were unable to confirm the opinion that this secondary rise in secretion is dependent on the formation of soaps in the upper intestine, the action of which is supposed to cause stimulation of gastric secretion. The duodenal instillation of a soap, such as sodium oleate, in proper concentration (15 per cent) produced, just as oil, first depression and then rise in secretion. The authors frequently saw a sharp rise of gastric secretion after the depression stage from agents other than fats. The result obtained with 40 per cent dextrose, used to illustrate the action of agents other than fat or fat derivatives, represents the most striking secondary rise of secretion. Obviously, soap formation is not involved here. By the use of duodenal instillates of different concentrations (2 and 15 per cent sodium oleate) the authors obtained a difference between the thresholds of response of the gastric motor and secretory mechanisms. The motor mechanism appears to have a lower threshold than the secretory. The mechanism of enzyme secretion also appears to be influenced differently from the acid mechanism. This is seen in the almost consistent earlier rise in enzyme concentration after the duodenal stimulant is stopped. The question was raised whether the secondary rise in the gastric secretion, following the secretory depression from the duodenal instillation of oil, might not represent a discharge of secretion stored up during the depression period. The authors believe that the duodenal influence is exerted chiefly, if not entirely, on the psychic phase of gastric secretion and, further, that this phase represents the important one. This is based on the prevention of the stimulation of gastric secretion during insulin hypoglycemia and on the failure of duodenal stimulation to prevent a rise in gastric secretion following histamine injection.

Specific Treatment of Staphylococcal Septicemia.—Julianelle says that the differentiation of staphylococci into types A and B was established primarily by immunologic and chemical differences between the intracellular polysaccharides extracted from the respective organisms and secondarily by the biologic distinction that type A strains are derived from pathogenic conditions while type B strains are apparently saprophytic. Lat

the determination of types was simplified by the mannite fermentation test, which separates type A from type B by the ability of the former to metabolize acid from this sugar. Cutaneous tests indicated that, while the polysaccharide of type B is cutaneously inert, the similar preparation from type A elicits reactions in approximately 12 per cent of normal infants and children and 70 per cent of normal adults. An additional observation of greater importance was that, irrespective of skin reactivity, precipitins for the specific carbohydrate were demonstrable in the scrums of only those patients suffering from severe, prolonged, generalized infection and, indeed, only in those eventually recovering from the infection, so that the appearance of precipitating antibodies in the serums of patients has been accepted as a sign of favorable prognosis. Reflecting on the significance of the presence of precipitins only in the serums of patients recovering from critical infection, it was proposed to treat patients who had staphylococcic septicemia with antiserum containing a high titer of the precipitins capable of reacting with the specific carbohydrates. All the antisera used in this study were prepared from rabbits but it is probable that the antisera from other animals may be equally effective. After describing the preparation and administration of antisera, the author describes his clinical observations. Seventeen patients suffering with staphylococcic septicemia secondary to a primary lesion yielded on culture staphylococci belonging to type A and capable of fermenting mannite. All the patients were treated with type A antiserum prepared in rabbits and were given in addition whatever supplementary measures were indicated; such as surgical drainage and blood transfusions. The untoward reactions ascribable to the serum were mild, and in four cases the treatment was followed by serum sickness. The cutaneous reaction to the carbohydrate of type A is suggested as an index of sufficient treatment. Of the seventeen patients treated with type A antiserum, seven recovered and ten died. Of the ten patients dying, four died before the end of the first day of treatment, four had developed sterile blood cultures (and of these, three died of other causes) and two died with typical signs of staphylococcic infection. Exclusive of the four patients who succumbed within the first day, type A antiserum apparently sterilized the blood in eleven of thirteen cases.

Archives of Internal Medicine, Chicago

64: 409-660 (Sept.) 1939

- Range of Normal Blood Pressure: Statistical and Clinical Study of 11,383 Persons. S. C. Robinson and M. Brucer, Chicago.—p. 409.
- Bilirubin and Urobilin Content of Bile Obtained by Duodenal Drainage: Normal Values and Values for Patients with Cholecystitis. M. Royer, Buenos Aires, Argentina.—p. 445.
- *"Cardiac Cirrhosis" of Liver: Clinical and Pathologic Study. H. M. Katzin, J. V. Waller and H. L. Blumgart, Boston.—p. 457.
- Hematology of Sternal Marrow and Venous Blood of Pregnant and of Nonpregnant Women. H. H. Pitts and Evelyn A. Packham, Vancouver, B. C.—p. 471.
- *Phosphatase Activity in Chronic Arthritis. C. L. Steinberg and Louise Catherine Suter, Rochester, N. Y.—p. 483.
- Electrocardiographic Findings in Cases of Ventricular Aneurysm. M. Eliaser Jr. and J. Konigsberg, San Francisco.—p. 493.
- Effects on Cardiovascular System of Man of Fluids Administered Intravenously: III. Studies of Glomerular Filtration Rate as Measured by Urea Clearance. D. R. Gilligan, M. D. Altschule and A. J. Linenthal, Boston.—p. 505.
- Experimental Renal Insufficiency Produced by Partial Nephrectomy: XI. Diets Containing Dried Extracted Liver. A. Chanutin and S. Ludewig, University, Va.—p. 513.
- Id.: XII. Diets Containing Dried Extracted Meat. A. Chanutin and S. Ludewig, University, Va.—p. 526.
- *Intracerebral Carcinomatous Metastases. C. C. Hare and G. A. Schwarz, New York.—p. 542.
- Primary Carcinoma of Liver: Tumor Thrombosis of Inferior Vena Cava and Right Auricle. R. Gregory, Washington, D. C.—p. 566.
- Thioyanate Dermatitis: Report of Case. M. E. Green and J. S. Snow, Ann Arbor, Mich.—p. 579.
- Lipoid Pneumonia: Report of Two Cases. C. F. Garvin, Cleveland.—p. 586.
- Vascular Disease: Review of Some of Recent Literature, with Critical Review of Surgical Treatment. G. W. Scupham, G. de Takáts, T. R. Van Dellen and W. C. Beck, Chicago.—p. 590.
- "Cardiac Cirrhosis" of Liver.—In examining 2,000 consecutive necropsy protocols, Katzin and his collaborators found that 286 of the deaths were due to congestive cardiac failure. Increased hepatic fibrous tissue was found in one third of these cases and this was approximately three times the incidence found in the remaining 1,714 cases in which congestive failure was absent. The incidence of fibrosis in cases of chronic passive congestion increased with the duration of congestive failure, and the more severe grades were found in cases in which the illness

was of longest duration. The causal significance of chronic passive congestion in the production of hepatic fibrosis was emphasized by the increasing incidence and severity of the fibrosis with increasing duration of congestive cardiac failure. The only type of increase of fibrous tissue peculiar to this group of cases of cardiac decompensation was central fibrosis, for, with a single exception, no instance of central fibrosis was found among the 1,714 cases in which necropsy failed to disclose congestive failure. Portal fibrosis also was found in a larger percentage of such cases than in cases in which chronic passive congestion was absent. This suggests that chronic passive congestion with resulting anoxemia, by increasing the susceptibility of the hepatic tissue, is also a contributing factor to fibrosis in the portal areas.

Phosphatase Activity in Chronic Arthritis.—Steinberg and Suter determined the phosphatase content of the serum of forty-four patients with atrophic arthritis, eight with hypertrophic arthritis, five with mixed atrophic and hypertrophic arthritis, five with osteitis deformans and six healthy persons. In the only case of arthritis in which the value for serum phosphatase was above 4.2 units it was later proved that malignant tumor of the prostate gland was present, with secondary involvement of osseous and pulmonary tissue. An increase of serum phosphatase in this type of malignant disease has been described by Gutman and his co-workers. Determination of the phosphatase content of the serum in cases of chronic atrophic and hypertrophic arthritis is therefore important in the differential diagnosis. A normal value for serum phosphatase is characteristic of chronic atrophic or hypertrophic arthritis; an abnormal value suggests the possibility of a complicating condition or an erroneous diagnosis of this condition. Determinations of the phosphatase content of the serum should be made a routine procedure in the study of diseases of the bones and joints.

Intracerebral Carcinomatous Metastases.—Hare and Schwarz describe the clinical features of 100 cases of intracerebral carcinomatous metastases and the pathologic features in thirty-four of these cases in which necropsy was performed. The study is limited to cases in which the tumor has spread, presumably by way of the blood stream, to involve the parenchyma of the brain. The authors' conclusions are that: 1. Bronchogenic and mammary carcinoma commonly metastasize to the brain. 2. The primary carcinoma in cases of cerebral metastasis is most commonly in the lung or breast; sixty-five of the 100 primary tumors were so located. 3. A bronchogenic carcinoma often manifests its effects by cerebral metastasis before there are any pulmonary signs. 4. Carcinoma with cerebral metastases is not uncommon in persons less than 40 years of age. This occurred in twenty-seven of the 100 cases. 5. The disease occurs predominantly in male patients in the ratio of 3.2:1, provided the cases of primary carcinoma of the breast are excluded. 6. Symptoms of metastasis are usually of short duration before the patient becomes seriously ill. 7. The onset of intracranial symptoms occurred suddenly in thirty-six cases. 8. Patients with metastatic cerebral tumor do not tolerate surgical procedures well. The average duration of life from the time of the first neurologic symptom until death was 3.6 months for the thirty-two persons who died while under the authors' care. The survival period was much shorter for those who were operated on. 9. Mental alterations of varying degree were present in 50 per cent of the patients studied. 10. Severe headache may be a prominent symptom. It may or may not be associated with papilledema. 11. Signs of chronic debilitating disease may be absent. They were lacking in 40 per cent of the cases. 12. Abnormality of the spinal fluid occurred in 70 per cent of the cases in which it was examined. 13. X-ray evidence of erosion of the sella turcica may be present. It was not uncommon in spite of the short duration of the cerebral metastases. 14. Encephalographic and clinical studies may localize one of the metastatic masses, which is usually the largest, and may fail to show the presence of other, smaller, nodules. 15. Even after metastasizing to the brain, bronchogenic carcinoma may not appear as such on roentgenograms of the chest. 16. Metastatic cerebral tumors may be single or multiple. Multiple tumors were observed in twenty brains removed at necropsy. 17. In practically all cases of cerebral metastasis there are metastases to other organs. 18. Cerebral disease in addition to the metastases may be present. Such was the case in four of the

present series: cholesteatoma in one and syphilis of the central nervous system in three. 19. Surgical removal of single metastases in a few cases may prolong life for months or even for several years; however, such cases form a small percentage, as most patients die shortly after craniotomy. 20. Subtemporal decompression often relieves the headache and affords great comfort to the patient. 21. When craniotomy is to be performed, x-ray studies of the chest should be made, regardless of the age of the patient.

Archives of Otolaryngology, Chicago

30: 319-496 (Sept.) 1939

- *Atrophic Rhinitis: Treatment with Estrogenic Substances, with Biopsy Before and After Treatment. W. W. Eagle, R. D. Baker and E. C. Hamblen, Durham, N. C.—p. 319.
- Nasograph Mirror of Glatzel as Measure of Nasal Patency. C. C. Lieb and M. G. Mulinos, New York.—p. 334.
- Motion Pictures of Human Larynx. W. A. Lell, with technical assistance of W. J. Sullivan, Philadelphia.—p. 344.
- Congenital Tracheo-Esophageal Fistula Without Atresia of Esophagus: Report of Case with Plastic Closure and Cure. C. J. Imperatori, New York.—p. 352.
- Neurologic Complications of Infections of Temporal Bone and Paranasal Sinuses: Summary of Twenty Years' (1919 to 1938) Experience. J. C. Yaskin, Philadelphia.—p. 360.
- *Larynx in Infantile Beriberi. V. C. Alcantara and G. deOcampo, Manila, Philippine Islands.—p. 389.
- Oro-Antral Openings and Their Surgical Correction. A. Berger, New York.—p. 400.
- *Constitutional Background of Infection of Upper Part of Respiratory Tract. J. B. Price, Norristown, Pa.—p. 411.
- Larynx of the Tuberculous Child. H. Rubin and S. Galburt, Brooklyn.—p. 421.
- Paranasal Sinuses. S. Salinger, Chicago.—p. 442.

Atrophic Rhinitis.—Eagle and his associates used estrogens in the treatment of fourteen patients with atrophic rhinitis. Sections of their nasal mucosa were studied before and during or after treatment with regard to specific histologic alterations attributable to the local action of the estrogens. The first biopsy specimen in each case was obtained previous to any treatment and the second one was taken from twenty-seven to 216 days after the first treatments with estrogenic substances were started. No patient complained specifically of deafness and tinnitus. Twenty-two patients started the estrogenic treatment and had the original biopsy but, owing to economic reasons and the distance to the clinic, eight did not return for the second biopsy. The patients irrigated their noses twice daily with physiologic solution of sodium chloride or 1:10,000 solution of potassium permanganate and ten minutes later repeated the irrigation to remove the crusts that had been loosened by the earlier washing. Then 0.5 cc. of estrogenic substance was sprayed into the nose twice daily, giving each patient the equivalent of 1 cc., or 1,000 international units, of estrogen daily. Twenty-one of the twenty-two patients reported clinical benefit and each wished to continue treatment. The patient with stormy menopausal symptoms stated that she was not improved to the slightest degree. Inspection of the nose revealed certain marked diminution or complete eradication of crusts in all fourteen cases in which the study was completed, and in no instance was the odor characteristic of the disease detectable. The only changes noticeable in the mucosa were a slight increase in hyperemia and a smoother surface. Patients complaining of a burning sensation in the scalp and occipital headache were relieved of these symptoms. The authors are unable to state whether the patients' noses were free of crusts because of the more frequent irrigations or because of the estrogenic therapy. The impression was that the surface epithelium and the subepithelial glandular system contained more mucous cells after treatment than before. It appeared that the amounts of squamous and ciliated epithelium and the vascularity, as well as various other features, were not altered. No perfectly consistent change in any one direction existed. Fibrosis was recorded more frequently before than after treatment. The protocol method of analysis suggested increased function of the mucous glands, and the statistical method decreased density of the tunica proper after treatment. It is possible that study of a far larger series of patients might give significance to some of these suggestions. The present observations indicate the absence of obvious morphologic changes.

Larynx in Infantile Beriberi.—Alcantara and deOcampo examined the larynxes of thirty-seven infants from 1 to 9 months of age with infantile beriberi. In eleven the disease was complicated by acute infection of the respiratory tract. Hoarseness

and weakness of the voice, or aphonia, was the most frequent symptom. The final diagnosis of infantile beriberi was given in all these cases by the pediatrician. The laryngeal lesions found were as follows: The five patients with acute cardialgic beriberi, in whom the impairment of voice was slight, showed only slight congestion of the vocal cords, their motility being normal. In the rest, impairment of motion of the vocal cords existed. The right vocal cord was paretic or could not move completely to the median line in four cases, stayed immobile in the middle in nine and assumed a cadaveric position in three. The left vocal cord was paretic in five cases, completely immobile in the median line in nine and cadaveric in one. The vocal cords were bilaterally affected in three cases. In some cases the paretic vocal cord appeared at a lower level than the normal. Twenty-two of a control group of thirty-one children with diseases other than infantile beriberi but with hoarseness as a complaint also, examined laryngoscopically, showed only congestion of the vocal cords, which moved normally. The rest had impairment of movement of the vocal cord, but in almost all of them there was a coexistent pathologic condition which might explain the paresis. In the rare cases in which the impairment of motion seemed to be entirely attributable to the inflammatory congestion of the larynx, the hoarseness and the impaired motility were of short duration in contrast to their long duration in the cases of beriberi. The authors believe that impaired motility of the vocal cords should be added to the already recognized diagnostic factors of infantile beriberi. In cases in which beriberi and acute infection of the respiratory tract coexist, the motility of the cords is of help in determining whether both are present and what degree of deficiency of vitamin B₁ exists in the child. Irritation and then degeneration of the abductor fibers of the vagus nerve followed by similar changes in the other fibers, the tensors and adductors appear to be the clinical facts in the production of the laryngeal lesions. Cardiac enlargement does not seem to have any influence on the degeneration. Clinically and probably pathologically, at least with regard to the laryngeal lesions, there is a close similarity between adult and infantile beriberi.

Constitutional Background of Respiratory Infection.

—Price studied the influence of constitutional factors in infections of the upper part of the respiratory tract by examining two groups of subjects. One of these groups was selected from 754 male and female students at Ursinus College and was composed of young men and women who came from good, solid, substantial, middle class families, representing the average, normal type. The other group was a cross section of the male and female inmates of Pennhurst State School, degenerative types. Members of both these groups live in the same vicinity, the institutions being within 10 miles of each other. Subjects of the degenerative type are more affected by the constitutional factors in their basic background than are those of the other type, who are slightly affected. The difference in the incidence of infection of the upper part of the respiratory tract in the two groups strikingly indicates the variation of the constitutional factor. In an analysis of this factor, the vasomotor reactions in the two groups were compared by studying the dermatographic response. The dermatographic reaction was more definite in the degenerative group. It is pointed out that abnormal vasomotor reactions may be an important element in the mechanism of infection of the upper part of the respiratory tract. Unless the constitutional factors in the case can be changed definitely, treatment will accomplish but little. Physiologic equilibrium should be the goal. If the autonomic system, the endocrine system or the acid-base metabolism is at fault, one must diagnose the condition and attempt to regulate it physiologically.

Canadian Public Health Journal, Toronto

30: 419-468 (Sept.) 1939

- Present Situation Regarding the Adequacy of Medical Care in Canada. G. Fleming, Montreal.—p. 419.
- What Can the University Contribute to Public Health Education? F. Fraser, Sackville, N. B.—p. 424.
- Nutrition in Canada. E. W. McHenry, Toronto.—p. 431.
- Study of 456 Deaths in Ontario Attributed to Diabetes. R. D. DeGree, Mary A. Ross and A. H. Sellers, Toronto.—p. 435.
- The British Columbia Peace River Health Unit. J. M. Hershey, Fort Coupe, B. C.—p. 445.
- Campaign Against Ragweed. H. B. Anderson, Toronto.—p. 451.

Delaware State Medical Journal, Wilmington

11: 171-190 (Aug.) 1939

- Ten Year Comparison of Sanatorium Patients. L. D. Phillips, Marshallton.—p. 171.
- *Incidence of Syphilis in Delaware. J. R. Beck, Dover.—p. 172.
- Classification of Cases Admitted to the State Board of Health Venereal Disease Clinics. T. E. Hynson, Dover.—p. 174.
- Epidemiologic Control of Syphilis in Delaware. L. L. Fitchett, Felton.—p. 176.
- Infant Mortality in Delaware. F. I. Hudson, Dover.—p. 179.
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- Another Step Forward in Public Health. R. C. Beckett, Dover.—p. 182.
- Why Care for the Deciduous Teeth? Margaret H. Jeffreys, Dover.—p. 184.
- Place of Nutrition in a Health Program. Charlotte Spencer, Dover.—p. 185.

Incidence of Syphilis in Delaware.—Beck states that 868, or 94.5 per cent, of the students at the University of Delaware were given Kahn and Wassermann tests and only one positive blood reaction was obtained. Other groups (domestics, food handlers, nursery school children and industrial school girls) were also tested and the proportion of positive reactors ranged from 0 to 4.5 per cent in the white persons and from 4.8 to 47.2 per cent in the Negroes. From the figures presented, it is estimated that less than 2 per cent of the white and about 30 per cent of the Negro population of Delaware have syphilis.

Indiana State Medical Assn. Journal, Indianapolis

32: 445-556 (Sept.) 1939

- *Chronic Rheumatic Brain Disease as Factor in Causation of Mental Illness: Report of Two Cases. W. L. Bruetsch and M. A. Bahr, Indianapolis.—p. 445.
- Present Status of Shock Therapy in Treatment of Dementia Praecox. P. B. Reed, Indianapolis.—p. 451.
- Metrazol in Schizophrenia. E. R. Smith, Indianapolis.—p. 456.
- Results of Insulin Shock Therapy in Ten Cases. H. A. Stellner and H. L. Watson, Evansville.—p. 459.
- Sinusitis Diagnosis and Nonoperative Treatment. W. F. Gessler, Fort Wayne.—p. 463.
- Surgical Treatment of Sinusitis. R. J. McQuiston, Indianapolis.—p. 466.
- Early Diagnosis and Prevention of Deformity in Crippling Diseases of Childhood. A. R. Shands Jr., Wilmington, Del.—p. 471.
- Theoretical Considerations of Clinical Electrochemical and Electrophysical Phenomena. W. L. Green, Columbus.—p. 474.

Chronic Rheumatic Infection and Mental Illness.—Chronic rheumatic infection might be the etiologic factor in certain cases of long standing mental illness. In the necropsy service of the Central State Hospital of Indianapolis, Bruetsch and Bahr observed that, in some subjects with old rheumatic changes on the heart valves, gross lesions in the form of small or large infarctions were present in the brain and at times in other organs. In most of these instances the clinical record did not give reference to a previous rheumatic infection, and none of the patients had gone through an acute attack of rheumatic fever while an inmate of the institution. Particular attention was given to the presence of rheumatic valvular heart disease in the necropsies of 500 mental patients. Other forms of endocarditis, such as the subacute bacterial form, were ruled out by gross and microscopic examination. The anatomic investigation disclosed chronic rheumatic valvular disease to be present in 4 per cent. Microscopic examination of all the organs of these patients showed that the long-continued rheumatic infection had involved not only the heart but also the brain and other organs, such as the kidneys, spleen and pancreas. The changes in the brain consisted of an obliterating rheumatic endarteritis of small and larger vessels having resulted in gross and microscopic infarctions and in numerous minute areas of incomplete softening (acellular areas). Small connective tissue scars originating from proliferating vessels and extending over several cortical cell layers were frequently observed. Glial nodules were occasionally seen in the cortex and in the white matter. Two patients with a psychosis of short duration had a rheumatic encephalitis. Some of the cases were diagnosed as dementia praecox, others as manic depression or as involutional and senile psychoses. In two cases the diagnosis was psychosis with cerebral arteriosclerosis, because residual signs of a "stroke" were present. If the rheumatic infection produces brain lesions in childhood, mental deficiency may result.

Journal of Urology, Baltimore

42: 269-480 (Sept.) 1939. Partial Index

- Adenocarcinoma of Kidney with Metastasis to Lung: Cured by Nephrectomy and Lobectomy. J. D. Barney and E. J. Churchill, Boston.—p. 269.
- Parenchymal Calculosis of Kidneys. M. Muschat and L. Koolpe, Philadelphia.—p. 293.
- Migration of Renal Stones Associated with Pyonephrosis and Perinephric Abscess into Lung. M. A. Granoff, Gloversville, N. Y.—p. 302.
- Unilateral Renal Agenesis with Associated Genital Anomalies. D. H. Drummond and H. D. Palmer, Rockford, Ill.—p. 317.
- Carbuncle of Kidney: Report of Ten Cases. G. A. Ingrish, Chicago.—p. 326.
- Asymptomatic Hydronephrosis Resulting from Papilloma of Ureter. Elizabeth M. Ramsey, Washington.—p. 341.
- *Hormone Control of Prostate and Its Relation to Clinical Prostatic Hypertrophy: Survey of Literature. B. Vidgoff, Portland, Ore.—p. 359.
- Estrogenic Property of Testosterone Propionate: Allen-Doisy Test as Questionable Indicator of "Female" Hormone in Urine of Men. J. F. McCahey and A. E. Rakoff, Philadelphia.—p. 372.

Endocrine Control of Prostate.—Vidgoff points out that an endocrine relationship is implied because man's sexual activity is supposedly waning when prostatic hypertrophy becomes troublesome. The accidental finding of epithelial metaplasia in the prostate of animals after the injection of theelin has led to the theory of estrogenic dominance in a bisexual organ as the explanation of the clinical picture. The author is not convinced that this is a specific observation because it is well known that estrogenic substance is a general epithelial stimulant. Furthermore, the anatomic evidence does not support this theory. The many reports of remarkable relief from the clinical picture with testosterone are not convincing. In animals, testosterone causes a hypertrophy of the prostate. The clinical experimental work has been insufficiently controlled. The beneficial effects obtained by the use of the testosterone in prostatic hypertrophy is probably due to the effect on the congestion surrounding the adenoma. For the same reason, prostatic hypertrophy in the human being is capable of undergoing spontaneous amelioration. There is evidence to show that the testis elaborates a substance which has an inhibitory effect on the prostate. This inhibitory substance has not been isolated as yet, but work going on at present shows promising results. Much experimental work on the problem, rigidly controlled, is necessary.

Laryngoscope, St. Louis

49: 603-738 (Aug.) 1939

- Rhinology in Children: Résumé of and Comments on Literature for 1938. D. E. S. Wishart, Toronto.—p. 603.
- Modern Views Regarding Anatomy and Physiology of Vestibular Tracts. O. Marburg, New York.—p. 631.
- Immunologic Aspects of Blood Invasions, with Special Reference to Sinus Thrombosis. G. Schwartzman, New York.—p. 653.
- Use of Monochord in Routine Tests of Hearing. F. T. Hill, Waterville, Maine.—p. 666.
- Skull Fractures Involving the Ear: Clinical Study of 211 Cases. W. E. Grove, Milwaukee.—p. 678.
- Thyatron Inlector, Its Behavior with Certain Vowels and Its Use in Instructing Deaf Children. T. A. Sterne and H. J. Zimmerman, St. Louis.—p. 708.

Nebraska State Medical Journal, Lincoln

24: 281-320 (Aug.) 1939

- Inoperable Sarcoma of Bone: Cures After More Than Five Years. J. P. Lord, Omaha.—p. 281.
- Reduction of Colles Fracture. H. R. Miner, Falls City.—p. 286.
- Orthopedic Care of the Arthritic Patient. H. F. Johnson and G. Whiston, Omaha.—p. 289.
- Skin Diseases Commonly Encountered During the Summer. O. J. Cameron, Omaha.—p. 294.
- Use of Bee Venom in Treatment of Arthritis and Neuritis. G. W. Ainsley, Fairbury.—p. 298.
- Surgical Aspects of Acute Abdomen in Infancy and Childhood. C. W. McLaughlin Jr. and H. H. Davis, Omaha.—p. 304.
- Review of Hypertension: Case Report. E. J. Kirk, Omaha.—p. 308.

New England Journal of Medicine, Boston

221: 329-366 (Aug. 31) 1939

- *Studies on Heredity in Jewish Diabetic Patients. A. Rudy and C. E. Keeler, Boston.—p. 329.
- Surgery of Extrahepatic Biliary Tract. C. K. P. Henry, Montreal.—p. 333.
- *Complete Heart Block Resulting from Overdosage with Thyroid Extract. M. Ainsner and J. F. Dorsey, Boston.—p. 336.
- Bacteriology. C. A. Janeway, Boston.—p. 339.

Heredity in Jewish Diabetic Patients.—Rudy and Keeler collected data on the importance of heredity as an etiologic factor in diabetes mellitus in the families of 1,037 Jewish patients. Among 1,000 successive nondiabetic patients admitted to the

Beth Israel Hospital, sixty-three reported one or more members of their families as having had diabetes. The disease was at least four times as frequent in the families of the 1,037 diabetic subjects. According to Cammidge it is even more than eleven times as frequent. From the data of their hospital records the authors found 29.1 per cent with one or more diabetic individuals in their families. Interviews with 246 Jewish diabetic patients revealed a higher proportion of positive family histories, eighty-seven (35.3 per cent). Of 302 patients with a positive family history of diabetes, 164 (15.8 per cent) gave a hereditary history and 138 (13.3 per cent) only a familial history. Adult Jewish diabetic patients (aged 20 or more) show 28.6 per cent diabetic heredity: 15.3 per cent hereditary and 13.3 per cent familial. Jewish patients show a higher frequency of the familial type of diabetic heredity regardless of age. The ratio of women to men is nearly 2:1. Of twenty married couples with diabetes, from the ages of 48 to 77, two couples had no children, and six of the remaining eighteen had one diabetic child each. In the majority of the Jewish men and women diabetes developed between the ages of 50 and 54, the same age Joslin found for all his men and women patients. A study of the A and B blood groups and the M and N blood types has been carried out in some diabetic patients in order to determine whether there is any relation between the diabetic constitution and the known blood characters. The data are not considered conclusive but it may be said that the distribution of the blood types M and N and the blood groups A and B in diabetic patients shows no striking difference from that in nondiabetic patients already reported in the literature.

Heart Block from Thyroid Extract.—Aisner and Dorsey cite a case of complete heart block following an overdose of thyroid extract taken for obesity. A review of the literature since 1882 shows ten cases of complete heart block developing during the course of true hyperthyroidism but no cases in which the block was induced by the administration of thyroid extract. The transient nature of the heart block in the case reported suggests that the disturbance may be a function of reversible chemical changes in the myocardium rather than of morphologic alterations. The case illustrates what may be expected from the uncontrolled use of thyroid extract in the treatment of obesity.

New York State Journal of Medicine, New York

39: 1637-1706 (Sept. 1) 1939

- Multiple Traumatic Ulcers Superimposed on Postosteomyelitic Scar of Tibia: Successful Plastic Repair. D. Warshaw, New York.—p. 1643.
Atypical Surgical Abdomen. M. Frieberg and R. L. Siegel, Brooklyn.—p. 1646.
*Use of Flask as Simple Aid to Tactile Fremitus. N. E. Reich, Brooklyn.—p. 1654.
Problem of Aftercoming Head in Obstetrics. R. J. Lowrie, New York.—p. 1655.
Agranulocytosis Due to Sulfanilamide. J. Taub and L. Lefkowitz, New York.—p. 1659.
Chronic Meningococcemia: Report of Case. J. J. Friedman and J. A. Buchanan, Brooklyn.—p. 1662.
Gaucher's Disease: Brief Review of Disease with Report of Case in a Male. R. C. Schleussner and C. F. Schnee, New York.—p. 1665.
*Hematogenous Tuberculosis. E. W. Billard, New York.—p. 1670.
Use of X-Ray in Diagnosis of Placenta Praevia. A. C. Beck and F. J. Light, Brooklyn.—p. 1678.
Cancer of Cardia, Roentgenographically Considered. W. H. Stewart and H. E. Illick, New York.—p. 1685.

Flask as Aid to Tactile Fremitus.—Just as the stethoscope has been an improvement over direct auscultation, Reich found that a 100 cc. Erlenmeyer flask was capable of increasing and localizing tactile fremitus. The flask conveyed the vocal vibrations from the wall of the chest to the hand in a most satisfactory manner. This was found to be especially suitable because of the thinness of the glass, the smooth, small localizing mouth flaring out at the base to cover a large area of palmar tactile endings. Less satisfactory was a 75 watt electric light bulb. The flask or bulb is applied lightly to the various regions of the wall of the chest with gentle pressure on the base with the open palm (ulnar side of the hand) or fingertips, with the patient repeating a short phrase or words or numbers. The usual variations exist; increase or decrease of tactile fremitus in pathologic conditions has the

same interpretation as that done with the hands only. The flask can prove useful in helping to localize small or early lesions of the lungs.

Hematogenic Tuberculosis.—Billard discusses the clinical aspects, pathologic changes and pathogenesis of hematogenic tuberculosis and in summary points out that pulmonary tuberculosis resulting from infection by way of the blood stream produces a clinical entity separate and distinct from the disease acquired by the usual bronchogenic route. The condition may be acute generalized miliary tuberculosis, producing a fulminating fatal condition involving the lungs and other organs in the body, or it may be chronic miliary tuberculosis in which the demonstrable lesion is limited to the lungs, although extrapulmonary foci, especially in the bones, joints and genitourinary tract, may occur without clinical evidence. These pulmonary lesions may be of varying extent, are usually bilateral and have a tendency to symmetry and localization in the apexes and the upper lobes. Symptoms of pulmonary disease may be mild or absent. Chronic hematogenic lesions are produced by single or repeated disseminations of bacilli into the circulation from various sources, as caseating tracheobronchial nodes, the primary pulmonary focus or extrapulmonary foci. They may heal by complete absorption, diffuse, fine fibrosis or dense, discrete calcified deposits. On the other hand, the lesions may run a low grade chronic or subacute course or they may progress and break down, producing bronchogenic dissemination. Foci are created simultaneously in extrapulmonary organs. They may be of the abortive type or they may give rise to chronic low grade infection. In chronic hematogenic tuberculosis, acute fatal dissemination may occur at any time; however, in the majority of cases the course is mildly protracted and patients suffer less than those with bronchogenic infection.

Surgery, St. Louis

G: 327-490 (Sept.) 1939

- Curability of Carcinoma of Stomach. L. Parsons and C. E. Welch, Boston.—p. 327.
*Pulmonary Embolism: Experimental and Clinical Study. G. de Takáts, W. C. Beck and G. K. Fenn, with technical assistance of Eunice F. Roth and C. Schweitzer, Chicago.—p. 339.
*Ovarian Tumors and Uterine Bleeding: I. Granulosa Cell Tumors. G. E. Seegar and H. W. Jones, Baltimore.—p. 368.
Cystadenoma of Ovary Incorporated Between Leaves of Mesosigmoid. E. A. Gaston, Framingham, Mass.—p. 389.
Simple Efficient Method to Diminish Incidence of Primary and Secondary Infection in Surgical Wounds. R. H. Jackson and R. H. Jackson, Jr., Madison, Wis.—p. 398.
Lesions of Intervertebral Disk and Ligamentum Flavum of Lumbar Vertebrae: Anatomic Study of Seventy-Five Human Cadavers. T. Horwitz, Philadelphia.—p. 410.
Cellophane as Wound Dressing. E. L. Howes, Washington, D. C.—p. 426.
New Colostomy Spur-Crushing Clamp. J. H. Garlock, New York.—p. 428.
Clamp and Spur Crusher for Obstructive Colonic Resection. A. S. W. Toutoff, New York.—p. 431.
Acute Intestinal Obstruction Caused by Nonabsorbable Suture Material. T. J. Snodgrass, Janesville, Wis.—p. 437.

Pulmonary Embolism.—De Takáts and his associates produced experimentally two types of fatal pulmonary embolism: one which plugs the terminal vascular bed and is characterized by cyanosis and dyspnea, and the other which represents an obstruction to the main pulmonary artery and exhibits a syncope attack with pallor and a fall in the blood pressure. The possible mechanisms of death are analyzed. Atropine, papaverine and oxygen are helpful in the peripheral type of embolism. Electrocardiograms taken of dogs before and after the production of a massive pulmonary embolism present a picture resembling serious interference with coronary flow. The possible causes of this interference are reflex vagal inhibition of the heart, peripheral vascular collapse arising from pulmonary hypertension through the depressor nerve and right acute ventricular failure. In the authors' series of 100 cases of pulmonary embolism there were eighty-seven deaths and thirteen survivors. Of the fatal cases, death occurred in less than 10 per cent within the first ten minutes, thus allowing time for emergency measures. On the basis of their experiments they recommend a combination of atropine and papaverine to counteract the radiation of autonomic reflexes, which originate in

the affected lung. Oxygen is obviously useful in the peripheral type of embolism, in which vasomotor collapse is absent but cyanosis predominates. The commonly employed drugs epinephrine, neosynephrine, digitalis and strophanthin are discussed but not recommended. As manifest thrombosis of the veins of the pelvis and lower extremities is comparatively rarely seen in patients with massive pulmonary embolism and heparinization of a large number of postoperative cases is yet impossible, early and active interference with the autonomic reflexes may be the only available life-saving measure.

Uterine Bleeding and Granulosa Cell Tumors.—Seegar and Jones state that abnormal uterine bleeding in association with ovarian tumors has been analyzed as to cause and frequency in a group of 376 cases. The mechanism responsible for the abnormalities in menstruation varies with the pathologic type of ovarian tumor. The highest occurrence of abnormal uterine bleeding was found in association with the tumors of granulosa derivation. In thirty-five papillary granulosa cell tumors, 45 per cent were associated with abnormal uterine bleeding. Of the fifty-nine solid granulosa cell tumors, 62 per cent were found to be associated with menstrual abnormalities. In both groups in which endometrium was available, endometrial hyperplasia was the direct cause of the uterine bleeding. The hyperplasia is presumably produced by the estrogenic secretion of the tumor itself. A more careful study of the uterine endometrium, together with endocrine studies on the blood and urine of patients with ovarian neoplasms, will render valuable assistance in the correct classification of ovarian tumors.

Surgery, Gynecology and Obstetrics, Chicago

69:257-416 (Sept.) 1939

- Carcinoma of Cervix Treated by Roentgen Ray and Radium. J. V. Meigs and H. L. Jaffe, Boston.—p. 257.
Pathologic Features of Soft Tissue Fibrosarcoma, with Special Reference to Grading of Its Malignancy. A. C. Broders, Rochester, Minn.; R. Hargrave, Wichita Falls, Texas, and H. W. Meyerding, Rochester, Minn.—p. 267.
Surgical Gastritis: Study on Genesis of Gastritis Found in Resected Stomachs, with Particular Reference to So-Called "Antral Gastritis" Associated with Ulcer. R. Schindler, H. Necheles and R. L. Gold, Chicago.—p. 281.
Problem of Intractable Peptic Ulcer. F. G. Connell, Oshkosh, Wis.—p. 287.
Surgical Treatment of Acute Profuse Gastric Hemorrhages. H. Finsterer, Vienna, Austria.—p. 291.
*Malignant Tumors of Small Intestine: Study of Their Incidence and Diagnostic Characteristics. F. G. Medinger, Wrentham, Mass.—p. 299.
Oxygen Therapy in Reactions Following Barbiturate Anesthesia and Cisternal Intervention. J. G. Schnedorf, Detroit.—p. 305.
Management of Hematogenous Pelvic Osteomyelitis. J. Kulowski, St. Joseph, Mo.—p. 312.
The Mikulicz Operation—Development and Technic. R. W. McNealy and M. E. Lichtenstein, Chicago.—p. 327.
Surgical Treatment of Exophthalmic Goiter. E. Bernabeo, Bologna, Italy.—p. 333.
Clinical Aspects of Sacrococcygeal Teratomas. L. Chaffin, Los Angeles.—p. 337.
Conservative Treatment of Diabetic Gangrene. S. S. Samuels, New York.—p. 342.
Repair of Large Defects After Removal of Cancer of Lips. E. M. Daland, Boston.—p. 347.
Nontraumatic Paralysis of Dorsal Interosseous Nerve. L. M. Weinberger, Philadelphia.—p. 358.
Pulsion Diverticula of Hypopharynx: Review of Forty-One Cases in Which Operation Was Performed and Report of Two Cases. S. W. Harrington, Rochester, Minn.—p. 364.
Treatment of Carcinoma of Uterine Cervix. A. Grossman, Chicago.—p. 373.

Malignant Tumors of Small Intestine.—Medinger gives the incidence of malignant tumors of the small intestine found in the pathologic material of the New England Deaconess and Palmer Memorial Hospitals during a period of twelve years. In a total of 1,456 postmortem examinations, malignant conditions were found in 63 per cent. There were approximately 41,000 surgical specimens and in 20 per cent of these the primary diagnosis was malignant growth. A review of the same series shows only ten cases that came to necropsy with malignant tumors of the small intestine, or an incidence for all necropsies of 0.69 per cent. The surgical material shows twelve cases, an incidence for malignant neoplasms of the small intestine of 0.03 per cent of the total specimens and 0.15 per cent of the total malignant growths removed surgically. Three of these twenty-two tumors were of duodenal origin, twelve jejunal and seven ileac. Sixteen were carcinomas and six sarcomas. The author's analysis of 134 cases of malignant growths of the small intestine, including his own series, shows

malignant tumors of the duodenum and ileum to occur slightly more frequently than malignant tumors of the jejunum. Carcinoma occurs most frequently in the duodenum and jejunum and sarcoma in the ileum. The clinical picture of carcinoma of the small intestine is variable. Biliary obstruction is most often seen with growths about the papilla of Vater, and intestinal obstruction with neoplasms of the lower duodenum, jejunum and ileum. Gross bleeding or occult blood in the stools is a frequent observation in malignant tumors of the small intestine. Any patient presenting signs of intestinal obstruction, change of intestinal habit or melena, in whom studies have eliminated any pathologic change in the esophagus, stomach, colon or rectum, should be carefully studied to eliminate the presence of a malignant growth of the small intestine. X-ray study with a special barium sulfate series of the small intestine is generally recognized as the best positive means of diagnosis but, by itself, is not infallible. Of the twenty-two patients, eighteen are known to be dead. Of the survivors, three patients are living and well with no recurrence for periods of eleven years, three years and less than one year. A fourth patient was living with no recurrence for one year and has since been lost to follow-up. The surgeon and the roentgenologist should look for malignant growths of the small intestine so that the proportion of cases diagnosed early and cured may be increased.

West Virginia Medical Journal, Charleston

35:399-446 (Sept.) 1939

- Diagnosis and Treatment of Irritable Colon. P. W. Brown, Rochester, Minn.—p. 399.
Obstetric Forceps. C. S. Bickel, Wheeling.—p. 404.
Coronary Disease and Coronary Thrombosis. C. G. Morgan, Moundsville.—p. 408.
*Preliminary Survey on Relation of Physical Defects to Scholastic Standing. A. C. Woofter, Parkersburg.—p. 413.
Pyloric Stenosis in Infancy. T. G. Folsom, Huntington.—p. 416.
Training for Emotional Health. E. F. Reaser, Huntington.—p. 418.
Pneumococcal Meningitis: Sulfapyridine Therapy, Recovery: Case Report. P. A. Haley 2d, Charleston.—p. 428.
Pneumococcal Meningitis Treated with Sulfapyridine and Specific Serum: Case Report. I. D. Cole and E. F. Hurteau, Clarksburg.—p. 429.

Physical Defects and Scholastic Standing.—Woofter studied the relation of diseases and defects to scholastic standing of 360 unselected students near the same age from various primary schools. The grades were obtained for the previous semester and classed accordingly as excellent, good, fair and poor. A separate list was compiled demonstrating the defects of each child. In plotting grades of the same number of students it was found that excellent students were absent an average of two and one half days while poor students lost twelve and one tenth days. This observation is again borne out by contrasting the number of children with infected tonsils having excellent grades, which is 10.5 per cent, with those of poor standing, 31.5 per cent. Among 159 students having normal tonsils, 18.2 per cent could be classed as excellent and 16.3 per cent as poor. Therefore infected tonsils can be considered detrimental, if for no other reason than loss of time from school. One group of 230 students contained 152 with unclassified defects, minor or major, with an increase of 25.5 per cent among the poor students over those of excellent standing. Serious eye defects are apparently the greatest scholastic handicap a student can have, since only 4 per cent having a visual acuity of 20/40 or worse were excellent students, while 44 per cent had a poor scholastic standing. With normal vision 16.8 per cent were doing excellent work and 17.6 per cent poor. Of 231 unselected students, 24.5 per cent of the excellent students had eye defects as contrasted with 40 per cent of those doing unsatisfactory school work. Testing with the Betts eye view apparatus revealed a variation of from 50 to 75 per cent of failures to have defective vision. Malnutrition, that is, a weight of 6 pounds (2.7 Kg.) or more below the accepted normal for the height and age of that particular child, cannot be regarded as serious, except that underlying physical or environmental conditions should be corrected. The curve for these children is somewhat less satisfactory than the class average. The relation of deafness to class standing could not be definitely studied as only sixteen cases were discovered, but only a few of these are known to be doing unsatisfactory work. There was such a small group of children with speech defects that no conclusions could be reached.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

51: 343-404 (Aug.-Sept.) 1939

- Classification and Definition of Clinical Varieties of Erythematodes (Lupus Erythematosus), with Particular Reference to Its Acute and Subacute Course. E. Urbach and Carmen C. Thomas.—p. 343.
- *Use of Sulfanilamide in Streptococcal Dermatoses. J. M. Flood and J. H. Stokes.—p. 359.
- Periadenitis Mucosa Necrotica Recurrens (Sutton); Ulcus Neuroticum Mucosae Oris (Löblowitz): Discussion of Condition with Description of Case. A. G. Fergusson.—p. 366.
- Infection of Peacock with Erysipelothrix Rhusiopathiae, Followed by Case of Human Erysipeloid. Averil W. Greener.—p. 372.
- Gowers' Case of Local Panatropy. S. Barnes.—p. 377.
- Chlor-Acne in Railway Workers. H. Haldin-Davis.—p. 380.

Sulfanilamide for Streptococcal Dermatoses.—Flood and Stokes present six cases of severe dermatitis in which cultures showed hemolytic streptococci in significant numbers. These cases were treated with sulfanilamide and showed definite improvement. Hospitalization is indicated for proper treatment and control of complications. Other etiologic factors must be considered and, after the condition is brought under control with sulfanilamide, they must be dealt with.

British Journal of Ophthalmology, London

23: 505-584 (Aug.) 1939

- Intracapsular Extraction of Cataract with Forceps: Is Its Use Justifiable? R. Buxton.—p. 505.
- Analysis of Judgment of Relative Position (Preliminary Communication). P. C. Livingston.—p. 540.
- Disability and Social Conditions of Patients with Past Syphilitic Interstitial Keratitis. Esther Dalsgaard-Nielsen.—p. 544.
- Treatment with "Glaucosan" of Cases of Glaucoma Operated on Without Success, and of Complicated Cataracts. C. Hamburger.—p. 557.
- Double Vision After Squint Operation. Alice Sternberg-Raab.—p. 568.

British Journal of Radiology, London

12: 505-568 (Sept.) 1939. Partial Index

- Radiographic Demonstration of Circulation Through the Heart in the Adult and in the Fetus, and Identification of Ductus Arteriosus. A. E. Barclay, J. Barcroft, D. H. Barron and K. J. Franklin.—p. 505.
- Suggestions for Radiodiagnosis of Fractures of Labyrinth: Medicolegal Importance. C. Chausse.—p. 536.
- Intensity of Radiation and Selective Action. J. van Roojen.—p. 547.
- Rapid and Convenient Method of Checking Kilovoltage in X-Ray Therapy. D. E. A. Jones.—p. 554.
- Radium-Needle Threading Apparatus. R. K. Scott.—p. 559.
- Radium Plaque Accessory. R. K. Scott.—p. 562.

British Medical Journal, London

2: 383-432 (Aug. 19) 1939

- Varicosities of Veins: Choice of Treatment and End Results. L. Rogers.—p. 383.
- Nervous Disorder After Injury: Review of 400 Cases. J. Ramsay.—p. 385.
- Structure and Functions of Synovial Membrane and Articular Cartilage. A. G. T. Fisher.—p. 390.
- Relation of Anterior Pituitary Gland to Carbohydrate Metabolism. F. G. Young.—p. 393.
- Ocular Reaction to Foreign Protein: Account of Slightly Unusual Case. T. G. W. Parry.—p. 396.

2: 433-476 (Aug. 26) 1939

- Toxic Goiter. C. A. Joll.—p. 433.
- Postpartum Hemorrhage, with Special Reference to Partial Detachment of the Placenta. R. M. Corbet.—p. 438.
- Preoperative and Postoperative Treatment of Hepatobiliary Diseases. B. O. C. Pribram.—p. 441.
- Nephrectomy with Partial Resection of Other Kidney. R. C. Begg.—p. 445.
- *Alternating Hemiparetic Migraine Syndrome. J. B. Dynes.—p. 446.

Alternating Hemiparetic Migraine Syndrome.—Dynes records the cases of a mother and daughter who suffered from migraine and paralysis on the side opposite to that of the headache. They usually were warned of an approaching attack by prodromes: general malaise and chilliness. The attack itself was ushered in by numbness, tingling, marked weakness and loss of power in the arm and leg opposite to that of the headache. The migraine was not always on the same side, but the paralysis was always on the side opposite to it. Three years ago, at the age of 46, the mother was treated with radium for a uterine carcinoma. Her menses stopped. She has had no migraine headaches since and is in fairly good health at the present time. The daughter has noticed that a severe migrainous headache seems to be precipitated whenever her menstrual period is irregular and runs over the usual interval of twenty-eight days.

Ergotamine tartrate (0.0005 Gm.) given intramuscularly at the onset of one of her attacks altered the syndrome, as no hemianopia or paralysis of the extremities developed. The headache, nausea, vomiting and confusion which always accompanied the attacks were not relieved. The patient is being treated with estrogenic substance in an attempt to regulate her menses and also to evaluate, if possible, the effect on the migraine syndrome.

2: 551-592 (Sept. 9) 1939

- Genito-Urinary Infection in Childhood. W. Sheldon.—p. 551.
- Anesthesia in Dental Surgery. Freda B. Pratt.—p. 555.
- Cerebrospinal Fluid in Anterior Poliomyelitis. Joan C. Drury and A. F. Sladden.—p. 557.
- *Acute Yellow Atrophy of Liver: Two Cases, with One Recovery. E. Townsend.—p. 558.
- Puerperal Agranulocytosis Following Sulfanilamide Treatment: Record of Fatal Case. I. K. Gayus, V. B. Green-Armytage and J. K. Baker.—p. 560.
- *Postoperative Treatment of Appendicular Peritonitis with Sulfanilamide and Its Derivatives. D. C. Corry, A. C. Brewer and C. Nicol.—p. 561.

Acute Yellow Atrophy of Liver.—The two cases of acute liver atrophy that Townsend cites present certain features in common. Both occurred in puerperal women, in both a small amount of chloroform had been given and in each case the onset of symptoms had been preceded by vomiting with restricted food and fluid intake. In the first case the period of restricted intake was three days, but it was at a time when a great deal of energy was being expended and the extent of the diminished intake and its significance were not appreciated at first. In the second case diet had been restricted for three weeks because of preeclamptic toxemia, and fluid intake had been minimal for twenty-four hours following induction of labor, because of post-anesthetic vomiting. Each patient was partially exhausted and believed to have been partially dehydrated, though not to a degree recognizable clinically, and was given chloroform, a substance highly toxic to liver cells. The dangerous potentialities of chloroform in this respect have been shown by the work of Whipple and Sperry, Opie and others. It is suggested that these facts have an important bearing on the etiology of acute yellow atrophy: that exhaustion and dehydration are predisposing factors to hepatic damage, that a patient who is vomiting and dehydrated from whatever cause should be regarded as a potential candidate for hepatic atrophy, and that the administration of any protoplasmic poison or drug known to affect the cells of the liver be done with extreme caution, preferably preceded by saline dextrose intravenously. These cases also emphasize the importance of maintaining the strength and fluid intake of women during prolonged labor. Recovery of the second patient is attributed to the use of dextrose and abundant fluids and it is believed that the early and energetic use of dextrose and fluids is of prime importance in the treatment of acute yellow atrophy.

Sulfanilamide for Appendicular Peritonitis and Abscess.—Corry and his colleagues report the results obtained with sulfanilamide in the treatment of twenty-six cases of general peritonitis (with a mortality of 11.5 per cent) and fifteen cases of appendical abscess with no deaths. These forty-one cases came from a series of 232 cases of appendicitis and the three deaths gave a mortality rate of only 1.1 per cent. Of the patients who died, only one at necropsy still had a general peritonitis of the lower part of the abdomen and this patient had been given what is regarded as an adequate dose of sulfanilamide. When toxicity due to sulfanilamide occurs, the drug must be stopped. In several cases anaerobic and actinomycotic organisms were present in the peritoneal cavity. Since sulfanilamide has been of value against these organisms elsewhere in the body, it is reasonable to suppose that it was of value also in appendical peritonitis.

Edinburgh Medical Journal

46: 509-580 (Aug.) 1939

- Some Reflections on Pathogenesis and Treatment of Cancer of Breast. J. Fraser.—p. 509.
- Radiologic Treatment of Breast Cancer and Its Metastases. J. H. Maisin, P. Estas and D. Line.—p. 529.
- Effect of *p*-Aminobenzenesulfonamide on Various Bacteria in Vitro and in Vivo. R. Knight.—p. 542.
- Pulmonary Tuberculosis in Children, with Special Reference to Adult Types of Disease. J. A. Wilson.—p. 556.
- Tuberculosis of Lungs in Childhood: Problems and Results of Treatment. C. Cameron.—p. 565.

Glasgow Medical Journal

14: 1-44 (July) 1939

Chemotherapy of Pneumonia by Sulfapyridine in Practice. J. Macrae.—p. 1.
Nomograms for Hematologists. G. H. Bell.—p. 16.

14: 45-96 (Aug.) 1939

Personal Experiences in Vascular Surgery. J. H. Pringle.—p. 45.
*Hemochromatosis: Two Cases. A. W. Harrington and Anne C. Aitkenhead.—p. 61.

Hemochromatosis.—Harrington and Aitkenhead report two cases of hemochromatosis; one came under observation because of diabetes and the other because of hematemesis. Lawrence has recorded a pedigree which suggests that hemochromatosis may be a sex-linked hereditary disease, transmitted by women, and affecting men mostly. However, the authors state that in their cases there was no suggestion of familial incidence. The blood copper was normal. The only certain etiologic factor was alcohol, in which both had indulged freely. The woman patient had a large cirrhotic liver with moderate ascites, and a severe diabetes with little tendency to acidosis. The man, who also had a large firm liver and marked diabetes, had two fairly severe attacks of hematemesis but no ascites. Pigmentation was marked in both and appeared to vary in intensity from time to time. The prognosis is said to be uniformly bad but the introduction of insulin may prolong life. Of the present patients, the man is working as a commercial traveler. The woman, who was in poor social circumstances, kept very well, with no recurrence of ascites until she contracted septic complications which caused her death.

Journal of Laryngology and Otology, London

54: 443-530 (Aug.) 1939

Otogenic Meningitis. T. Cawthorne.—p. 444.

Journal of Physiology, London

96: 233-366 (Aug.) 1939

Respiratory Accelerator Action of Carotid Sinus-Cardiac Depressor Mechanism. Ruth C. Partridge.—p. 233.
Further Observations on Release of Histamine by Skeletal Muscles. G. V. Anrep, G. S. Barsom, M. Talaat and E. Wieninger.—p. 240.
Use of Dietary Aneurotic Adult Rat for Assay of Estrus-Inducing Gonadotropic Substance. R. D. H. Heard and S. S. Winton.—p. 248.
Acetylcholine Synthesis in a Sympathetic Ganglion. G. Kahlson and F. C. MacIntosh.—p. 277.
Apparent Augmentation of Pituitary Antidiuretic Action by Various Retarding Substances. R. L. Noble, H. Rinderknecht and P. C. Williams.—p. 293.
Central Action of Anticholinesterases. A. Schweitzer, E. Stedman and S. Wright.—p. 302.
Effect of Hydrogen Ion Concentration on Stability of Antidiuretic and Vasopressor Activities of Posterior Pituitary Extracts. H. Heller.—p. 337.
Peripheral Action of Tetanus Toxin. A. M. Harvey.—p. 348.

Lancet, London

2: 549-580 (Sept. 2) 1939

*Trauma and Progressive Muscular Atrophy. J. W. A. Turner.—p. 549.
Treatment of Fractures by Local Anesthesia. H. Cullumbine.—p. 552.
Urethral Obstruction Following Prostatectomy. S. Power.—p. 553.
Accidental Transmission of Malaria to a Child by Injection of Blood. D. Nabarro and D. G. F. Edward.—p. 556.
Surgical Treatment of Facial Paralysis: Review of Forty-Six Cases. W. M. Morris.—p. 558.
*Picrotoxin in Treatment of Barbiturate Poisoning. J. L. Lovibond and G. C. Steel.—p. 561.

Trauma and Progressive Muscular Atrophy.—Turner says that the part played by trauma in the initiation of progressive generalized nervous diseases becomes occasionally subject to dispute in relation to workmen's compensation. In view of the lack of data derived from any notable series of cases, it seemed to him worth while to analyze a series of cases of progressive muscular atrophy to find out in what proportion a history of trauma exists. The term progressive muscular atrophy is taken to include amyotrophic lateral sclerosis and progressive bulbar palsy with muscular atrophy. The author studied a series of 100 consecutive cases. In thirty-seven cases there existed signs of progressive degeneration of the bulbar nuclei associated with generalized muscular atrophy and fibrillation either with or without evidence of involvement of the pyramidal tracts. Forty patients presented progressive muscular wasting associated with evidence of involvement of the pyramidal tract. Widespread muscular wasting and fibrillation of the classic type of progressive muscular atrophy without involvement of the pyramidal tract was observed in nineteen cases.

Postmortem confirmation of the diagnosis was obtained in four cases. For purposes of control a second series of 100 cases of other organic nervous diseases were analyzed. These 100 cases included patients of the same age groups and sex groups suffering from various organic diseases of the nervous system in which trauma is not thought to be an etiologic factor. A table records frequency of trauma in the two groups of 100 cases. There was no history of trauma in seventy-nine cases of the group with progressive muscular atrophy and in seventy-eight cases of the control group. Thus the total number of cases with a history of trauma was practically identical. It was only when an arbitrary period of a year was taken that a small difference in favor of the group with progressive muscular atrophy was apparent. In five of the cases of progressive muscular atrophy there was a history of injury within a year of the first symptom, and in three of these the injury was within a month of it. The author reports the details of these five cases. He reaches the conclusion that trauma has no primary part in the causation of the disease but in a small minority of cases seems to precipitate the appearance of symptoms.

Picrotoxin in Treatment of Barbiturate Poisoning.—Favorable reports on the use of picrotoxin as a physiologic antidote for barbiturate poisoning induced Lovibond and Steel to try this method in a case of poisoning of this type. The results which they obtained with the treatment were so striking that they feel justified in reporting the case. A woman aged 35 had been found unconscious in bed in the morning, having probably been in coma since the preceding night. The diagnosis of barbiturate poisoning was made from the clinical appearance of the patient and was afterward confirmed by the identification of this substance in the cerebrospinal fluid (cobalt nitrate and Millon's tests positive). On admission she was in a deep coma, collapsed and failing to respond to any form of stimulus. Until it was possible to obtain the picrotoxin some three hours later, the routine treatment for hypnotic poisoning was initiated. This consisted of gastric lavage, lumbar puncture, intravenous saline solution and intranasal oxygen. However, no significant change was observed in the patient's condition and she was still in deep flaccid coma when the treatment by picrotoxin was started. This was given by intravenous injection in divided doses of 2 cc. of a 0.3 per cent solution. The picrotoxin was at first given intermittently for two hours until the patient had been fully stimulated into effectual restlessness. For the next ten hours it was discontinued until a gradual relapse required a further 18 mg. In the intervening hours and subsequently, until 10 p. m. two days later, 4 cc. of coramine (a 25 per cent solution of pyridine betacarboxylic acid diethylamine) was injected intravenously at two hour intervals. A total of 54 mg. of picrotoxin and 112 cc. of coramine was given. The effect of the picrotoxin after every injection was dramatic and obvious, whereas no remarkable result was evidenced at any time from the coramine. The problem of dosage remains controversial but it seems that far larger therapeutic doses are both possible and safe. The authors gained the impression from this case that if it had been more severe they could with impunity have given larger doses of the drug. Intravenous picrotoxin should be given continuously until spontaneous movements, restlessness and a substantial decrease in the coma are apparent. After this, intramuscular injections may be sufficient to sustain the stimulatory effect. As a precautionary measure, barbiturates such as evipal or pentothal should be kept ready as a rapid antidote to an overdose of picrotoxin.

2: 581-628 (Sept. 9) 1939

Acute Rheumatic Carditis. W. T. Ritchie.—p. 581.
*Familial Adenomatosis of Colon and Rectum: Its Relationship to Cancer. J. P. Lockhart-Mummery and C. E. Dukes.—p. 586.
*Bacteremia Following Tonsillectomy. S. D. Elliott.—p. 589.
Production and Prevention of Cardiac Murals Thrombosis in Dogs. D. Y. Solandt, R. Nassim and C. H. Best.—p. 592.
Monocytic Angina (Glandular Fever) Treated with Sulfapyridine: Report of Case and Experimental Transmission. H. S. Stannus and G. M. Findlay.—p. 595.

Familial Adenomatosis of Colon and Rectum.—During the last fourteen years, Lockhart-Mummery and Dukes observed the course of adenomatosis of the colon and rectum in ten families whose histories convincingly demonstrate the general familial character of the disease and its close relationship to cancer. The starting point in each case was a person with adenomatosis. As complete a family history as possible was

obtained from the patient, information being asked particularly about the present health or cause of death of parents, grandparents, uncles and aunts. Almost invariably the patient was aware of the high incidence of death from intestinal cancer among his relations. As many of the surviving relations were seen as was possible and sigmoidoscopic examinations were carried out. It was impossible to find out whether or not deceased relations dying of cancer had also been affected by adenomatosis. Probably in most cases the fatal cancer was secondary to adenomatosis. Although this disease is familial, it does not manifest itself as a rule before childhood or puberty. The age at which adenomas begin to develop varies in different families. In twenty cases the average age at which adenomas were discovered was 22. The tumors were probably present for at least a year or two before they were discovered; so the average age at which adenomas developed may be taken as about 20. In two families recently investigated by McKenney (1936) the average age was 19½ years. Malignant disease secondary to adenomatosis is characterized by its early onset and the fact that more than one primary focus of carcinoma may be present. Among the general population it is rare for cancer of the rectum or the colon to develop before 40 to 50, but in families affected by adenomatosis it often begins to develop between 30 and 40 or even earlier. The age of death from cancer in adenomatosis families is also younger (42 years) by about twenty years than in the general population. As a rule in families affected by adenomatosis the tumors begin to develop at about 20 years of age, malignant changes may be expected about fifteen years later and untreated patients die from cancer in the early forties. From an observation of the genealogical tables it is seen that the disease may be transmitted by either sex. In most cases only one parent was affected. In two instances there is evidence that both husband and wife died of cancer and in most of the descendants adenomas developed at an early age. In one family having twins, symptoms of adenomatosis developed in both twins at about 30 years of age. One was treated by colectomy at the age of 41 but died from the operation. His twin sister died of intestinal cancer also at 41. The familial character of adenomatosis is not congenital in the ordinary sense of the word, since it does not manifest itself for several years; but it is certainly due to an inherited defect, and the most likely explanation seems to be that it is caused by a gene mutation. Evidence is steadily accumulating that tumors are the result of a genetic change in a normal growing somatic cell. This explanation is applicable also to adenomatosis, in which disease the genetic defect appears to be a tendency to a more rapid growth of the intestinal mucosa, leading first to hyperplasia and later to adenomas. Because of the more rapid growth of the intestinal epithelium there must be a greater frequency of mitotic division, and this again increases the probability of a further gene mutation which manifests itself as cancer. In a rapidly growing adenoma the chance of this happening is much greater than in normal mucosa, in which mitosis takes place only at comparatively rare intervals. The explanation suggests that familial adenomatosis is the result of an inherited instability of the epithelial cells of the large intestine, which renders their nuclei peculiarly liable to undergo mutation for excessive rate of growth. The treatment of adenomatosis presents a difficult problem. Constant medical supervision is necessary so that a radical excision may be undertaken as soon as a malignant change is detected.

Bacteremia Following Tonsillectomy.—Elliott noticed a transient bacteremia in thirty-eight of 100 patients within a few minutes of tonsillectomy. Bacteria were found in the blood regardless of whether the tonsils were removed by blunt guillotine or by dissection. The organisms isolated included *Streptococcus pyogenes*, *Streptococcus viridans*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *staphylococcus* and *corynebacterium*. Serologic matches for *Streptococcus pyogenes* recovered from the blood were isolated from the corresponding tonsils after their removal. Hemolytic streptococci were recovered from the tonsils of eighty-seven of 137 patients undergoing tonsillectomy (64 per cent). Of forty-four cultures of streptococci so isolated and examined serologically, thirty-nine (86 per cent) belonged to group A, one to group B, one to group C (Lancefield) and three could not be typed. The source for the common occurrence of transient bacteremias in man and

animals and the possible bearing of these observations on the etiology of subacute infective endocarditis are indicated by the foregoing observations. Occasionally the causal organism in subacute infective endocarditis is of the hemophilus or parahemophilus group and that these organisms may be found in the blood after tonsillectomy is indicative. Of equal interest is the observation that pathogenic organisms such as *Streptococcus pyogenes* may circulate in the blood for short periods and in small numbers without producing any observable ill effect. The results of the tonsillar cultures here recorded suggest that some 60 per cent of patients admitted to the hospital for tonsillectomy carry *Streptococcus pyogenes* in the throat. Most of these patients had diseased tonsils, although it was not customary to admit cases for tonsillectomy within six weeks of an attack of tonsillitis. A carrier rate of about 60 per cent among patients admitted to the hospital for tonsillectomy emphasized the risk in otorhinologic wards of streptococcal cross infection, which a previous inquiry has indicated as happening not infrequently in the absence of special preventive measures (Okell and Elliott, 1936).

Medical Journal of Australia, Sydney

2: 267-302 (Aug. 19) 1939

- *Inquiry into Effects of Occupation on Pulmonary Condition of Stone Masons. K. R. Moore and C. A. Kuhlmann.—p. 267.
Acute Cholecystitis: Study of Series of Cases in Which Conservative Methods of Treatment Were Used. V. M. Coppleson.—p. 274.
Portable All-Purpose Anesthetic Machine. A. D. Morgan.—p. 284.

Pulmonary Condition of Stone Masons.—Moore and Kuhlmann determined the clinical and roentgen pulmonary condition of 355 employees in the stone mason allied industries in New South Wales, Victoria and South Australia. This has been accompanied by inspection of working conditions and the taking of dust counts. The existence of industrial pulmonary fibrosis of two distinct types was revealed, as well as evidence of other more acute respiratory disorders which may be the result of occupational conditions. Of 268 masons examined, 111 were found to be suffering from pulmonary fibrosis of moderate or advanced degree or from tuberculosis. This quota comprised seventy-nine cases of moderate fibrosis of the diffuse type (pneumoconiosis), thirteen of advanced fibrosis of similar type, eight of advanced fibrosis of silicotic type, two of pulmonary fibrosis complicated by active tuberculosis and one case of active tuberculosis only. The remaining cases were of doubtful tuberculous lesions, either alone or complicating a fibrosis. Cases of moderate fibrosis were not associated with incapacitation from work. Of the eight cases of silicosis detected, all except one were found among workers in sandstone, which has a high content of free silica (from 86 to 95 per cent). Workers handling this stone were found to develop fibrosis earlier and in a more severe form than those using granite or other stones with a low free silica content. The incidence of pulmonary fibrosis in marble and limestone workers was very low. Groups of workers examined, other than masons, including polishers and sawyers, were relatively small; but there is evidence to show that the disease develops among these workers. An apparently high incidence of emphysema and old or recent pleurisy was revealed by the roentgenograms.

New Zealand Medical Journal, Wellington

38: 231-300 (Aug.) 1939

- *Symptoms and Diagnosis of Cancer of Body of Uterus. K. Mackenzie.—p. 234.
Morbid Anatomy and Treatment of Cancer of Body of Uterus. C. Chapman.—p. 238.
Factors Which Govern Proper Nutritional Management. J. A. Pollia.—p. 244.
Normal Lead 4F in Electrocardiography. J. D. Cottrell.—p. 252.
Incidence and Prevention of Hydatid Disease in New Zealand. L. Barnett.—p. 256.
Diabetes Mellitus Associated with Diabetes Insipidus: Report of Case. G. E. Moloney.—p. 263.
Physiology of Water Balance. N. L. Edson.—p. 266.

Symptoms and Diagnosis of Uterine Cancer.—Despite the rarity of cancer of the uterus without bleeding, Mackenzie declares that it is imperative that curettement should be done in all cases of leukorrhea in which it is seen by the speculum that watery or purulent discharge is coming through the cervical canal. The size and consistency of the uterus have no vital bearing on the diagnosis of uterine cancer. In many cases there is no enlargement, but there may be enlargement, usually of a

uniform character, up to several times the normal size of the uterus. The mistake that the author has seen made has been in cases of enlargement of moderate degree in which a diagnosis of fibromyoma has been made, not corrected at operation, and supravaginal hysterectomy carried out at a level too near to the tumor for safety. He does not discuss the symptoms of advanced cases of uterine cancer. He believes that while the course which a disease runs should be sketched out for the student, the symptomatology of early disease only should be stressed and emphasized. Oversight in the diagnosis of cancer may be self excused on the ground that there were no pain, no ill smelling discharge and no deterioration of general health. The points of cardinal importance are that (1) irregular bleeding is the dominant symptom of carcinoma of the uterus, (2) such bleeding, at any age, must not be treated symptomatically and (3) the curet and the microscope must be used in diagnosis.

Practitioner, London

143:237-356 (Sept.) 1939

- Rheumatic Problem: Plea for National Campaign Against Rheumatic Diseases. L. S. P. Davidson.—p. 237.
Diagnosis and Treatment of Chronic Articular Rheumatism. F. D. Howitt.—p. 246.
Diagnosis and Treatment of Fibrositis and Neuritis. A. R. Neligan.—p. 263.
Diagnosis and Treatment of Trunk Sciatica. J. B. Burt.—p. 275.
Orthopedic and Surgical Aspects of Chronic Rheumatism. A. G. T. Fisher.—p. 286.
Laboratory Investigations in Chronic Rheumatism. J. W. Shackle.—p. 297.
The Abortion Report. J. Young.—p. 309.
*So-Called Obstetric Shock. C. D. Lochrane.—p. 317.
Advances in Medical Treatment of Congenital Pyloric Stenosis. R. Lightwood.—p. 326.
Modern Therapeutics: III. Calcium in Therapeutics. N. Morris.—p. 333.

So-Called Obstetric Shock.—An increased susceptibility to shock, Lochrane points out, is characteristic in labors associated with most of the toxemias of pregnancy. These conditions are held to be due to the circulation of incompletely disintegrated protein substances of fetal or maternal origin in the maternal blood. There is a toxic influence in the development of the shock-collapse picture in the majority of instances. The cause of the shock not infrequently reported to follow a supernormal degree of hemorrhage in obstetrics as in other more general conditions may not, at first sight, seem to be explained on the foregoing suggestions, as, in obstetric instances at least, hemorrhage is by no means invariably associated with gross trauma or pregnancy toxemia. The obstetric conditions with which the shock-collapse syndrome is most often associated (e. g. toxic accidental hemorrhage, placenta praevia, acute inversion of uterus, manual removal of placenta) emphasize the fact that trauma and toxemia in some, and trauma or toxemia in others, is incidental in greater or lesser degree to labor associated with such abnormalities. A distinction between the preliminary or primary shock phase and the secondary collapse phase of the shock-collapse syndrome appears to be justified in obstetrics. The percentage incidence of fatal degrees of shock in obstetrics is not large in comparison with the total incidence of the condition. In the absence of gross trauma, lesser degrees of primary shock of a more or less temporary nature may arise from some minor operative intervention such as the giving of a rather hot intra-uterine douche or the lifting of the fetal head over an intact perineum. The opinion may be hazarded that in these temporarily shocked cases there is a nerve center disturbance with little or no subsequent traumatic toxemia. In many of the more profound cases of obstetric shock the patient's condition may improve temporarily in an hour or so without major resuscitative measures, only to relapse into a worse state, the early nervous phase having been succeeded by the later toxic collapse. The observation that shock may be experienced after minor interventions without demonstrable gross trauma, undue hemorrhage or pregnancy toxemia in obstetric conditions provides the conclusion that, quite apart from any of these predisposing complications, there is an intrinsic variation in the degree of susceptibility of different individuals to shock. This seems to apply to both phases of the condition. At times there are obstetric patients in whom the degree of shock experienced is out of all proportion to apparent stress of labor. Here, if anywhere, there is a justification for the use of the term "obstetric shock" in a particular and restrictive sense.

In obstetrics there are other complicating conditions usually present which may well accentuate or even replace hemorrhagic and traumatic factors in producing a predisposition or an undue susceptibility to shock-collapse effects. Some of these are acidosis, a lowered carbon dioxide content of the blood, the extreme expenditure of muscular energy, waste products from muscular contractions and the blood-carbon dioxide reducing effect of most forms of inhalation anesthetics. It was shown by Yandell Henderson and later by Cannon that the fall in blood pressure which is a feature of shock is coincident with the lowering of the carbon dioxide content of the blood.

Bull. of Health Org., League of Nations, Geneva

S:1-386 (Nos. 1 and 2) 1939

- Report on Work of Health Organisation Between June 1938 and April 1939 and on Its 1939 Program.—p. 1.
Skeleton Standard Report on State of Health of Population and Factors Influencing It.—p. 63.
Rural Housing and Planning.—p. 87.
*Leptospiroses. B. Walch-Sorgdrager.—p. 143.

Leptospiroses.—In an extensive review on the subject of leptospiroses, Walch-Sorgdrager declares that the study of the disease was placed on a sound basis only when the specific cause was discovered by Inada and Ido, who transmitted the disease experimentally to guinea pigs in 1913 and discovered the spirochete which they called *Spirochaeta icterohaemorrhagiae* in 1914 and demonstrated that it is the actual cause of the disease. However, Weil's disease is not the only form of human leptospirosis. In Europe, but more especially in other continents—first in Japan and later in the Netherland East Indies, Federated Malay States, Russia, Andaman Islands, Netherlands and Australia—diseases have been described which are more or less related to it, though occasioned by other leptospirae. The several forms in man, and those occurring in dogs, rats and other rodents, are discussed in some detail. The author also discusses the epidemiology of icterohaemorrhagic leptospirosis in man and its clinical features, including incubation, clinical symptoms, complications, diagnosis, prognosis and treatment. Measures for the prevention of leptospirosis have been chiefly applied in countries in which the disease is prevalent, such as Japan, and also in countries in which it is not frequent but causes local epidemics, for example in slaughterhouses, baths and among seamen and sugar-cane cutters. Some of these procedures are the prevention of contamination of the ground and surface water with rat urine, the destruction of leptospirae in nature and the protection of workers in infected districts by preventing the organisms from penetrating through the skin or mouth. In places in which drainage and other measures are impossible or when the infected district is too large for disinfection to be effective, vaccination should be resorted to, for example in factories, mines, slaughterhouses, in instances in which the ratproofing of buildings is too costly or deratization is ineffective, on sugar plantations (on some Australian plantations the annual incidence of the disease among cane cutters sometimes reaches 18 per cent) and among sewer workers. When the risk of infection is limited to an occupational group, vaccination becomes practical. By immunization laboratory infections, where contact with rats is frequent and infections sometimes prove fatal, may be avoided. Wani mentions that he inoculated 10,268 miners in a coal mine in Fukuoka, 2,259 of whom received only one injection. The vaccination generally caused only slight discomfort: 50 per cent were able to continue working, 33 per cent lay off for one or two days and a slight rise of temperature or at least a complaint of a local feeling of warmth was experienced by from 30 to 40 per cent of the miners. Inoculation with other kinds of leptospirae than that causing Weil's disease, which are not in themselves dangerous to life (such as the leptospirae of "mud fever" or nanukayami) is of no value, as their immunizing properties, if any, are insignificant against Weil's infection. These kinds of leptospirae produce pathologic conditions, which are undesirable accompaniments of preventive inoculation. It is preferable, even essential, to vaccinate only with killed cultures. Health education and propaganda (films, lectures and the like) and compulsory notification are obvious necessities for an earlier recognition of cases as well as the stamping out of epidemic outbreaks.

Presse Médicale, Paris

47: 1277-1284 (Aug. 23) 1939

*Anorexia Nervosa and Its Immediate Therapy. P. Chatagnon and P. Scherrer.—p. 1277.

Anorexia Nervosa.—Chatagnon and Scherrer discuss the symptomatology and therapy of anorexia nervosa. Persons affected are generally women between the ages of 15 and 25 years. The clinical picture presents the following features: gradual self restriction of food leading to extreme emaciation, with a possible decline from a weight of 132 pounds (60 Kg.) to 55 pounds (25 Kg.); excessive physical and mental activity in striking contrast with the physical deterioration; the growth of bizarre, onesided gastronomic tastes, e. g. for prunes, biscuits, olives, unseasoned salads and so on; complete apathy in the face of bodily degeneration. Food forcibly administered is rejected by self-induced exertions. Amenorrhea is present. Usually there is found a neuropathic heredity and an unfavorable family environment provoking, on occasion, an inferiority complex toward a successful member of the family of the same sex. In certain cases the psychosis may be prodromal to dementia praecox; the majority of the patients develop conditions bordering on obsession. The occurrence of death is exceptional; however, some investigators set the mortality rate at 13 per hundred. Relapse after recovery is always possible. The authors discuss and reject the various views of others of the nosologic classification of anorexia nervosa within the framework of an established neurosis; neither do they favor an endocrine etiology of the disease, in spite of parallel indications simulating anorexia nervosa. They differentiate particularly between anorexia nervosa and Simmonds' syndrome. In Simmonds' syndrome emaciation develops gradually without an appreciable food diminution or, in its incipience, with none at all; there is present only a simple loss of appetite or distaste for certain foods, which the patient may seek to overcome and for which the metabolic dysfunction of his organism penalizes him by diarrhea; mental disorders are late, characterized by melancholia and unaccompanied with physical self neglect. On the other hand, in anorexia nervosa emaciation is the direct result of a food refusal that excludes all cooperation of the patient to improve his condition, the patient not only forcibly resisting alimentation but deliberately regurgitating what he has consumed; mental disturbances are immediate and compatible with a high degree of alert activity. Even amenorrhea is of a secondary nature in anorexia nervosa. According to the authors, therapy consists in isolating the patient in a sanatorium or hospital, in artificial alimentation and in psychotherapy, to the exclusion of medicaments of all kinds. Therapy will vary according to whether the patient is in an advanced or an incipient stage of the disease. Artificial alimentation in both classes of patients consists, with due regard to the age of the patient, of two daily doses, preferably of raw sweet milk with the addition of the yolks of one or two fresh raw eggs, together with fresh fruit juices (lemon, orange and so on). To restore tissue balance, from 250 to 500 cc. of dextrose solution is daily administered subcutaneously for a variable period and occasionally physiologic solution of sodium chloride. Reeducation of the patient in the use of his muscles needs also to be done. In cases presented at once for clinical study, psychotherapy should be employed immediately and should enlist also the cooperation of the family physician. Readjustment of the patient to social and family environment after her release from the institution constitutes a problem.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

105: 657-783 (June 21) 1939. Partial Index

- *Adrenal Capsule Lipoid Epinephrine Complex and Formation of Arteriosclerosis. W. Raab.—p. 657.
Bactericidal Effect in Urine of Certain Constituents of the Uva Ursi. G. Madaus and F. E. Koch.—p. 679.
Hydrostatic Pressure Action of the Bath on Circulation of the Blood. H.-J. Heite and E. Lerche.—p. 693.
Kinetics of Extrahepatic Bile Duct System. R. Bayer.—p. 702.
Quantitative Examinations of Ascorbic Acid Content of Endocrine Organs as Measuring Stick of Their Function. H. Winkler.—p. 723.
Effect of Various Kinds of Paprika on Kidney and Urinary Passages. Margarete Raunert.—p. 736.

Arteriosclerosis and Adrenal Capsule Lipoid Epinephrine Complex.—A close connection between the formation of arteriosclerosis and the functioning of the adrenal capsules has been frequently assumed, based on the following observations:

arteriosclerotic changes in the vessels of youthful individuals with adenomas of the medulla or tumors of the cortex of the adrenal capsules and in Cushing's disease usually accompanied with hyperplasia of the cortex; degenerative changes in the arterial muscular layers of animals corresponding to media-sclerosis, produced by protracted injections of epinephrine; increased infiltration of cholesterol in the intima of the aorta of rabbits following administration of epinephrine; a tissue cholesterol fixing faculty of the cortex hormone; changes produced in the vessels by repeated implantations of the entire substance of the adrenal capsules, which however do not quite correspond to typical arteriosclerosis. Recent research drew the attention to the close morphologic, functional and even physical and chemical connections between the products of secretion of the medulla and the cortex of the adrenal gland. Investigations on the constrictive effect of lipoid epinephrine compounds directed Raab's attention to the problem of a lipoid-epinephrine complex presumably formed in the adrenal capsules and the characteristic way in which it affected the structure of the wall of the artery. He carried out experiments on groups of animals with lipoid epinephrine complexes obtained from the adrenal capsules of animals and from the serum of persons with arteriosclerosis and hypertonia, assuming that the lipoid epinephrine complex should likewise be present in the serum. The extracts did not contain free epinephrine or cholesterol and produced the following effects in experimental animals: increase of blood pressure; increase of blood sugar; general nervous irritation such as trembling, nervousness, eventually edema of the lungs and death; injury of the media of the aorta, such as necrosis and calcification; injury of the intima, such as loosening and thickening, and an increased deposit in the intima of cholesterol ingested with food. As to the modifying effect of lipoids on the epinephrine in the lipoid-epinephrine complex, a satisfactory chemical explanation is not available at present. On the basis of these results as well as numerous clinical, pathologic and anatomic data the following factors appear to be of importance in the etiology of arteriosclerosis: prolonged action of an adrenal capsule lipid epinephrine complex on the vessel wall; protracted ingestion of food with large amounts of lipoids and cholesterol in particular, whose deposit is increased by the adrenal capsule lipid epinephrine complex; disposition of the vessels to the attacks of these injurious agents. According to the author, the frequent simultaneous occurrence of arteriosclerosis, high blood pressure and diabetes can perhaps be explained by the action of the adrenal capsule lipid epinephrine complex.

Bibliotek for Læger, Copenhagen

131: 323-353 (July) 1939

*Measurement of Venous Pressure in Thoracoplasty Patients. K. S. Stein.—p. 323.

Venous Pressure After Thoracoplasty.—Stein tabulates the results of his bilateral determinations of the venous pressure of forty-six patients, thirty-six before and after the first session of thoracoplasty, twenty-two of these also before and after the second session, seven patients before and after repeated plastic operation several years after the first operation, one patient with thoracoplasty according to Monaldi, one patient with plombierung and one operated on for pulmonary abscess, with drainage; the conditions which might be assumed to play a part in the venous pressure are also noted. In the majority of the cases operation was followed by a rise in the venous pressure, usually brief, the venous pressure in thirty-one cases becoming normal on from the seventh to the seventeenth day. There was no definitely established relation between the height of the venous pressure and the operative course. Preoperatively increased venous pressure, the author says, is not always an indication that operation will not be well borne. Theoretically he ascribes the postoperative increased venous pressure to changes in intrathoracic pressure and stasis in the vena cava superior region, but he thinks there may also be other causes; in some cases heart disease may be at least partly responsible, since electrocardiographic changes were often observed, and the fact that in most of the cases there was a considerable fall in the blood pressure during the operation might point to changes in the peripheral circulation as a factor.

THE STUDENT SECTION

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Organization of the Small Hospital Library

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From time to time the American Medical Association¹ through the Council on Medical Education and Hospitals issues suggested lists of medical books and journals suitable for hospital libraries. Such libraries are now required in all institutions approved for the training of interns and for graduate study in the specialties. The library requirements of the private clinic and of various medical associations are similar to those of the hospital and can be considered with them. The Council in its recommendations discusses the organization of such a library only in the briefest way, leaving aside entirely the problem of the classification of the collection which would accrue if their suggestions should be followed.

The needs, aims and uses of the library in the hospital and clinic are special and differ both from those of the public library with a medical department and from those of the large medical library associated with a medical school or research institution. Its function is practical and clinical. In the hospital it exists for the use of the intern and the attending physician; in the clinic it is consulted by the staff for aid in the solving of the many problems that daily arise. Stress therefore comes on the fields of diagnosis and of therapeutics, and the requirements in the departments of fundamental medical science and medical research are not great.

The type of library here described has its chief role to perform in the small city more or less isolated from the large medical center. It is frequently impossible for the individual practitioner to purchase a sufficient number of books or to subscribe to enough journals to give him anything more than the most meager reference store. Too often he has but few books, and his journals are unbound, stored away and unavailable. Libraries in small hospitals gen-

erally are made up of gifts or brought together by the pooling of individual collections and are supplemented by unsystematic and intermittent new purchases and subscriptions. There is no paid librarian, the use of the material is not great, no organization exists and interest lags. It is doubtful whether many such collections justify their existence.

All worth-while journals should be bound. Periodical files are the most valuable part of any medical library. Here only is the living advancing front of medicine visible. Here only in many instances can be found that detail of information concerning specific subjects necessary for the most successful prosecution of medical practice. Periodicals, however, offer little difficulty in classification, for they may be placed simply on the shelves in alphabetical order, and all material which they contain is readily available through the *Quarterly Cumulative Index Medicus* and other indexes.

The chief task therefore in library organization has to do with classification of the store of books. These may be recent or old. The shelves tend to accumulate many volumes that appear out of date. Some of these, generally gifts of collections assembled a generation or two ago, are so old that their material is of historical interest only. Others, more recent but still not new, contain a surprising amount of valuable content applicable to modern practice. There is a tendency among medical men to consider solely works of very recent publication worth their attention. In a certain few fields, where changes are rapidly taking place, they are doubtless right, but with regard to the bulk of the fundamental information on which medicine rests they are not. Especially when such books are supplemented by the record of contemporary progress depicted in the periodical literature, they are still worthy of a place on the active working shelves. However, in a library used chiefly by interns, who may rely largely on textbooks, it should be seen to that these are recent.

From the Inlow Clinic.

Numerous suggestions and criticisms were made by Miss Bertha Bowlby, librarian, Carnegie Public Library.

1. Hospital Medical Library Suggestions, J.A.M.A. 108:1052-1059 (March 27) 1937; 102:1785-1791 (May 26) 1934; 92:1122-1127 (March 30) 1929; 84:980-983 (March 28) 1925. Jenkins, R. L.: Periodicals for Medical Libraries, *ibid.* 97:608-610 (Aug. 29) 1931.

Among the older books, a few will be found worthy of the title of medical classic, works deserving perusal on the basis of their own intrinsic value and persistent significance in the history of medicine. These should be culled out and placed in a separate division. Other older books will have value only as being representative of the medical knowledge of the particular time in the specific field represented, and of course there is little point to collecting these unrestrictedly. A few illustrative works for each field in each period will be found sufficient. Most of these older books will come within the nineteenth century, for they will have been derived largely from American sources. Books older than this again deserve separate space and, if rare and valuable, may be put under glass.

Information concerning the details of library cataloging, and the getting ready of books for lending is easily available; it is given in sufficient fulness for the small library in the pamphlet issued by the Library Bureau.² It is chiefly with the classification of the books themselves that I am here concerned.

CLASSIFICATION OF BOOKS

Many methods of classification for medical libraries are in use and have been suggested; any one chosen will be found to be more or less arbitrary.³ In 1920 the Medical Library Association adopted the Boston Medical Library Classification⁴ as a standard for American medical librarians. It has much to recommend it, and it may seem superfluous as well as presumptuous to offer anything different. It has withstood the test of time and is in active use in many libraries. As is true of any good classification for general medical needs, it attempts to "refrain from any bias of an anatomical, physiological, clinical or surgical nature." The type of library which I am discussing possesses a bias, namely the clinical one. No more apology is needed in following it than in excusing the medical bias exhibited in all medical libraries with regard to knowledge in general. Libraries are of different sorts and exist for specific purposes. In formulating a classification primarily subservient to clinical requirements, however, it is still possible to have a system elastic enough to be adaptable to other ends.

The Boston schema has forty-two main classes denoted by numerals. Further division is car-

ried out by the use of the alphabet, the second place in the notation being occupied by capitals and the third by small letters. This gives the possibility of twenty-six primary and twenty-six secondary subdivisions.

Phalen and Garrison present two main headings, "Basic Disciplines" and "Medicine and Subdivisions," under each of which in separate lists are given one group of disciplines as "Subject" and another group as "Congeners or Related Subjects." There is no further attempt at integration and no notation other than single arabic numerals given to the main topics under "Subject." Barnard, using the alphabetical method of notation, divides the whole field of medicine into twenty-six classes, with numerous divisions, subdivisions and sections. His classification obviously has been developed for the use of the very large institution, one rich in the field of tropical medicine and parasitology, and its basis is largely etiologic. None of these schemata seem to meet the needs of the small clinical library.

What are these needs?

Any system adopted must be simple and at the same time susceptible of indefinite expansion. It must be one that can be administered on occasion by the record clerk or clinic secretary, untutored in the intricacies of library management; it must be one by which the average physician rapidly and readily can find the material he wants without assistance; it must be compact yet comprehensive in that it must include all fields in which the physician is likely to seek help.

The classification of the Boston Medical Library was formulated with the idea of bringing "together under one heading all material of a special nature," so that everything "relating to a system of organs or individual organs, whether of an anatomical, physiological, pathological, clinical or surgical aspect, is put in one place." This is quite admirable so far as the systematic theoretical study of medical topics is concerned and doubtless fits well the requirements of many institutions. However, in a library made use of as an adjunct to active medical practice, such concentration hinders rather than expedites the clinician's work.

Furthermore, forty-two or even twenty-six classes are too many for rapid orientation. Letters are less easy to follow and to associate with certain topics than are numerals. Since 1879 the Dewey⁵ decimal system has been in use in great numbers of public libraries. It has been elaborated on and added to in each subsequent edition until it leaves little to be desired for the needs of those general lay institutions

2. Miller, Zana K.: *How to Organize a Library*, ed. 8, Buffalo, Library Bureau Division of Remington Rand.

3. Garrison, Fielding H.: *Libraries, Medical, in Reference Handbook of the Medical Sciences*, ed. 3, 1915. Phalen, J. M., and Garrison, F. H.: *Classification of the Small Medical Library*, Mil. Surgeon 60: 274-300 (March) 1927. Barnard, Cyril C.: *A Classification for Medical Libraries, with Introduction, Local List, Index of Parasites and General Index*, London, Percy Lund, Humphries & Co., 1936. Cunningham, Eileen R.: *A Classification for Medical Literature*, ed. 2, Nashville, Tenn., Cullom and Ghermer Company, 1937.

4. *Boston Medical Library: Medical Classification*, ed. 2, Boston, Boston Medical Library, 1925.

5. Dewey, Melvil: *Decimal Classification and Relative Index for Libraries and Personal Use*, ed. 11, Adirondacks, N. Y., Forest Press, Lake Placid Club.

for which it was designed. In it the whole field of knowledge is divided into ten classes (general works, philosophy, religion, sociology, philology, natural science, useful arts, fine arts, literature, history), which are subdivided and resubdivided decimally ad libitum. Medicine is given

section in this classification, however, shows the organization of the medical field itself far from satisfactory from the clinical standpoint. The domains of anatomy, physiology and public hygiene are adequately and exhaustively treated, but many other fields are sadly neg-

System of Classification for the Small Library in Hospital and Clinic

Class 0 00 Generalia, Reference Works 01 Bibliography 02 Nomenclature, terminology and classification 03 Dictionaries 04 Languages, grammar, composition of scientific papers 05 Encyclopedias — general 06 Encyclopedias — medical 07 Collections of tables, formulas, useful data 08 Directories 09 Atlases 10 Commercial publications, price lists, trade catalogues	Class 5 50 Diagnosis, Technical Methods 51 General works, medical and surgical diagnosis 52 Symptomatology, semeiology 53 Clinical methods, history taking 54 Physical and instrumental diagnosis 55 Laboratory diagnosis, chemical, bacteriologic and microscopic 56 Electrodiagnosis, electrocardiography 57 Roentgenologic diagnosis 58 Postmortem examination, microtechnic 59 Differential diagnosis 60 Prognosis
Class 1 10 General Science 11 General works, scientific method 12 Mathematics 13 Physics 14 Chemistry 15 Geology, geography, meteorology 16 Biology 17 Anthropology, anthropometry, constitution, ethnology 18 Psychology 19 Sociology 20 Philosophy	Class 6 60 Therapeutics 61 General works 62 Personal hygiene 63 Dietetics, nutrition, vitamins 64 Pharmacology, materia medica, toxicology 65 Vaccine and serotherapy 66 Hydrotherapy, climatotherapy 67 Mechanotherapy, massage, exercises, gymnastics 68 Physical therapy, electrotherapy, actinotherapy 69 Radium and roentgen therapy 70 Psychotherapy, psychoanalysis
Class 2 20 Medical Science 21 General anatomy 22 Topographic anatomy 23 Embryology 24 Histology 25 Physiology 26 Physiologic chemistry, biochemistry 27 Pathology 28 Bacteriology, parasitology 29 Serology, immunology, allergy 30 Experimental medicine, research	Class 7 70 Social Medicine 71 Social medicine, marriage, sexology 72 Public health, preventive medicine, racial hygiene, eugenics 73 Epidemiology, geographic medicine 74 Biometry and statistics 75 Industrial medicine 76 Medical jurisprudence 77 Medical education, medical schools, museums 78 Medical societies 79 Medical economics, state medicine, health insurance 80 Medical profession, medical ethics
Class 3 30 Medicine and the Medical Specialties 31 Manuals, textbooks, systems in general medicine 32 Infectious diseases, fevers 33 Cardiovascular and renal diseases 34 Diseases of the respiratory system, tuberculosis 35 Gastro-enterology 36 Diseases of the blood and lymphatic systems, hematology 37 Dermatology, syphilology 38 Endocrinology, diathetic and deficiency diseases, metabolism 39 Pediatrics 40 Neurology, psychiatry	Class 8 80 Medical History, Cultural Medicine 81 General works in medical history 82 General history, archeology 83 The periods of medical history 84 History of special subjects 85 Biography 86 Medical essays 87 Philosophy of medicine, medical theory 88 Classic works in medicine 89 Illustrative works from the nineteenth century 90 Special collections
Class 4 40 Surgery and the Surgical Specialties 41 Manuals, textbooks, systems of general surgery 42 Anesthesia, operative surgery 43 Minor and traumatic surgery, first aid, bandaging 44 Fractures and dislocations, orthopedic surgery 45 Ophthalmology, otolaryngology 46 Oral and plastic surgery, surgery of head and neck 47 Neurosurgery, thoracic surgery 48 Abdominal surgery 49 Urology, proctology 50 Gynecology, obstetrics	Class 9 90 Associated Medical Fields, Miscellaneous 91 Mysticism, faith healing, cults 92 Tropical medicine and hygiene 93 Military and naval medicine, aviation 94 Comparative and veterinary medicine 95 Dentistry 96 Pharmacy, pharmaceutical manufacturing 97 Nursing 98 Hospitals, clinics, research institutions 99 General literary works 100 Medical miscellany, collected papers, transactions, reprints, government reports, etc.

the number 610 and listed under useful arts along with engineering, agriculture and domestic economy.

The decimal system used in this classification recommends itself immediately for adoption in spite of certain criticisms of its use. For instance, a misplaced point or a forgotten numeral works havoc. Errors of notation are possible in all systems, and this seems small justification for rejection. Study of the medical

lected, in fact just those most important in a working clinical library.

Any system of classification may have many valid criticisms leveled against it, and no general formula can be found which fits all needs. In presenting therefore a classification of my own, based on the Dewey system, with certain borrowings from many other sources, I appreciate fully that it represents solely the schema which has been found by experience to fit the

needs of one organization, the library of the Inlow Clinic. It is in the belief, however, that libraries very similar in their requirements to this one exist that the suggestions herein made are offered. This classification in outline form should be posted in a prominent place in the library. Furthermore, the ten main headings and many of the chief subheadings should be clearly indicated on the shelves by large labels. The shelves should be arranged so that the numbers follow in regular succession and little difficulty is experienced by any one coming into the library for the first time in locating the field he is seeking. Much material is thus readily available without consultation of the card index.

CATALOGUING OF BOOKS

Cataloguing in many instances may be difficult. Many works fall under more than one heading. It is best to place the book under that caption in which it appears to have most use in the individual institution. The whole spirit which should activate the clinical library is that of utility. Other headings under which a book may come are adequately taken care of by listings and cross references in the card catalogue.

It will be noted that this classification attempts an organic integration of medical knowledge and associated fields. It is functional and instrumental. In the formation of the classes and divisions I have followed in a broad way the order in which subjects are met in the course of medical education. From the standpoint of the intern this is desirable, for it is the sequence to which he is accustomed. First come the tools with which the physician works: indexes and volumes for ready reference, volumes on the languages, dictionaries and encyclopedias. The languages are the means by which medical writings in other tongues are made available. Preliminary bibliographic investigation is the *sine qua non* for the adequate tapping of periodical literature, and cyclopedias furnish rapid orientation in any subject. Then there is the broad field of scientific and medical knowledge in general. This is the material collected through the centuries, and it naturally falls into three groups: (1) the whole gamut of the natural and the social sciences with the exception of astronomy; (2) the medical sciences, those sciences which, though forming a part of other disciplines, nevertheless may be taken as integral parts of medicine itself, and (3) those subjects detailing the natural history and course of disease which constitute the true content of clinical knowledge.

Mathematics is the handmaiden of all the sciences; physics, chemistry and biology are at the basis of physiology and of pathology; geography, geology and meteorology have their role in geographic medicine and climatology; anthropology and psychology furnish material for the understanding of man himself; sociology is the

basis for many problems in preventive medicine, public health, medical jurisprudence and medical economics, and true critical philosophy is the discipline which weaves all these things together into an organic whole for the development of an adequate scientific world view.

The listing of the medical sciences here employed is quite familiar, since it includes those subjects encountered in the first two years of the usual medical course. The field of experimental medicine and research naturally fits in with this group of distinctly scientific studies.

In the practice of curative medicine, so called, the end which hospital and clinic subserve, there are two elements: the store of knowledge with which the practitioner works and the technical means at his disposal for the recognition and the control of disease. These two fields greatly overlap, and many works, especially those on medicine, surgery and the various medical and surgical specialties, contain material concerning both. Though in theory the knowledge on which curative medicine is based forms one integrated whole, yet from the practical standpoint it is divided into medical and surgical portions. Surgery in the strictly philosophic sense is merely a branch of therapeutics, the operative treatment of disease. In practice, however, it has assumed such importance and taken unto itself so much of the content of medical knowledge and theory that it approaches or equals the domain of internal medicine itself, especially so far as hospitals and private clinics are concerned, and should therefore be given separate consideration in any clinical library classificatory scheme.

The field of medical knowledge and practice has been divided into specialties. According to whether the medical or surgical element in these (for each specialty contains something of both) predominates, they may be classified either as medical or as surgical specialties. This portion of the clinical library, which I have placed under classes 3 and 4, doubtless will outweigh any other, for it will contain many of the books forming the real working nucleus of the entire collection.

The real function of the practitioner on the hospital or clinic staff is the recognition and the treatment of disease processes. His literary working tools lie largely in the fields of diagnosis and of therapeutics. Prognosis may be taken as a part of diagnosis; there are few works devoted to this subject alone. Some specialties will be found to owe their existence to diagnostic and therapeutic needs. Such, for instance, are clinical pathology, roentgenology and physical therapy. The domains of diagnosis and of therapeutics are fairly well separated, but in making of them separate classes roentgenology, which consists of diagnostic and of therapeutic elements, is separated on the

shelves rather than located in a single place, which would be more desirable to a specialist who united the two fields in his practice. No matter what system of classification is adopted, it will be found that such separations will somewhere have to be made.

The clinician as a rule in consulting the library has some specific problem in mind. He may already have made a tentative diagnosis, for example of trichinosis. His knowledge of this subject, however, may be hazy, for it has been a decade since he has observed a similar case. He consults the library for systematic information on the subject. He will turn to the section on general medicine therefore, where he will find in sufficient detail the material to satisfy his immediate needs. The laboratorian to whom he sends a specimen of stool or blood for verification of his diagnosis will consult the division of laboratory diagnosis. Only if they are curious to know more of the life history of *Trichina spiralis* will the clinician and laboratorian consult the division of parasitology in the class medical science. There are degrees of need and interest exhibited by those who consult the library and gradations of the extent to which any subject may require investigation.

THE CLINICAL LIBRARY

The problem, on the other hand, may be a purely diagnostic one. The clinician may wish not to overlook any of the possibilities relative to a presenting symptom; he may desire to verify what he can expect from some particular test; he may already be reasonably certain that the case is a medical or a surgical one but still be not satisfied as to just what is going on. He will consult the diagnostic divisions. Or again he may have arrived at a diagnosis and be undecided as to what is the best procedure to follow in treatment. Just what may be expected in this instance from physical therapeutic procedures? He may know the drug or endocrine preparation he wishes to give; but in what form and in what dose shall he prescribe it? This patient desires to go to a certain resort for rest and recuperation and asks for information concerning it. This one needs a certain diet. To answer these questions and to meet these desires he will consult the therapeutic section.

This brief discussion shows how in a clinical library attempted concentration of all material concerning one topic in one place may hinder instead of expedite diagnostic and therapeutic work. A library of this kind is of more service when it is departmental, that is, when the classificatory division is made on the basis of the separation of the field of medical practice among various types of practitioner (internist, surgeon, ophthalmologist, urologist, roentgenologist, laboratorian, physical therapist, dentist, nurse) rather than on the basis of anatomic

part or etiology. It leads to less confusion to have each specialist find the whole field in which he is primarily interested segregated in one part of the library without finding also before him on the shelves works concerning the topic in question treated from points of view which have little bearing on his particular approach.

In the classification here proposed, material on various topics is scattered purposely. If the practice of medicine in hospital and clinic were not itself departmentalized (specialized) this would be a serious drawback, but with conditions as they are this is not the case. It is seldom indeed that any one working in a clinical institution will consult the library to find out all that it contains about any one particular topic viewed from every possible approach. The place for concentration of all material concerning one subject is in the card catalogue and not on the shelves. For in fact the ideal of concentration aimed at in some classifications cannot be attained; some dispersion is inevitable from the very fact that most books discuss many topics but permit themselves physically to be put only in one place.

Medicine has broad social as well as individual personal functions to perform. There are those fields which have to do with the control of disease *en masse*, the topics of public health and preventive medicine; those which have to do with the application of medical knowledge to the solving of strictly social problems, such as the subjects of medical jurisprudence, criminology, juvenile delinquency. There is the domain of the relation of physician to patient, physician to physician and physician to society, medical ethics; that of the application of knowledge in a department of sociology, economics, to the problems of medical organization and practice. There is the charge of transmission of medical knowledge from one generation to another, medical education. All these I have segregated under the class social medicine.

Medical history is a part of cultural medicine. This subject has assumed such large importance in the field of medical bibliography that it deserves to be placed as a separate class. As a division under this are grouped all obsolete works of the nineteenth century. Besides being assigned their own distinctive notation, these volumes are classified according to the general schema, i. e. they likewise are assigned the number of the subject of which they treat. By this means two things are accomplished: 1. The seeker after recent information in any field does not find the shelf of his subject cluttered up by nonusable books. 2. He who is historically minded can find what he desires already separated for him. By this procedure gifts of old books can be put to their proper use.

The divisions of the last class, that of miscellany, are in a way parts of social medicine. Clubs, hospitals, sanatoriums and pharmacies, as well as veterinary medicine, dentistry and nursing are social institutions. Yet on practical grounds they belong in a group by themselves.

Naturally in the artificial placing of the whole field of medicine in classes and divisions of ten there will be apparent crowding of subjects in one place and lack of sufficient diverse headings in another. From the standpoint of making material available this drawback is more apparent than real. Throughout, those subjects have been grouped together which are allied either organically on the basis of content or in accordance with medical custom. Thus ophthalmology and otolaryngology are placed together, neurology and psychiatry and so on. These fields are similarly united in the person of a single practitioner in many of the smaller medical centers. However, though two or more specialties in many instances are placed under the same division, they can be separated easily as the library grows by the addition of a distinctive further notation.

SUBDIVISION OF SUBJECTS

In order to present the classification in as simple a manner as possible I have offered here only 100 headings over the whole medical domain. Even small libraries, however, will find it desirable in certain fields to go beyond this. Besides classes and divisions, subdivisions and sections can be established by adding a decimal point and more numerals. The use of more than four digits will seldom be found necessary even in the largest libraries. It must be emphasized that subdivision carried too far becomes a hindrance instead of a help.

The method of further classification can be explained briefly. In the instance of two or more main subjects grouped together under the same two digit symbol, these topics can be separated by the addition of letters from the alphabet to designate them, as employed in the classification of the Boston Medical Library. Thus, for example division 44, class 4, becomes broken up into 44A ophthalmology, 44B otology, 44C rhinology, 44D laryngology, and so on.

Small hospitals today are largely surgical institutions. Surgery rests on the disciplines of anatomy and pathology. The human body is readily divisible into various structures and organs; pathologic processes are easily recognized as being of different kinds. Further classification in the surgical specialties therefore naturally makes use of these time honored divisions; the anatomic classification will vary with the specialty and the organs and body system involved; the pathologic classification is largely the same for all structures. The subdivision is created on an anatomic basis and the section on a pathologic one. Thus,

division 47, abdominal surgery, falls into subdivisions 47.0 general works, .1 abdominal wall, hernia, .2 peritoneum, .3 stomach, .4 intestine, .5 liver, .6 gallbladder and bile passages, .7 pancreas, .8 spleen, .9 mesentery, miscellaneous. The same method of subdivision is applied to thoracic surgery, urology, gynecology and other branches. The pathologic classification is .00 surgical and pathologic anatomy, .01 anomalies and malformations, .02 regressive and degenerative changes, .03 disturbances of circulation, .04 general inflammations, .05 specific inflammations, tuberculosis, syphilis, etc., .06 changes in lumen, position, size, .07 injuries, .08 foreign bodies, concretions and parasites and .09 tumors. Thus, for instance, a surgical work on carcinoma of the stomach would be labeled 47.39.

In other classes the basis of division cannot of course be anatomic and pathologic but must be suited to the material in hand. For instance, the division periods in medical history can be subdivided into .0 prehistoric medicine, paleopathology, .1 ancient medicine, .2 Graeco-Roman medicine, .3 Byzantine period, .4 Mohammedan and Jewish period, .5 medieval periods; .6 renaissance and reformation period, .7 seventeenth century, .8 eighteenth century and .9 modern period.

By subdivision and further elaboration, unlimited expansion can be taken care of, and, though designed for the use of the small library, the classification can be employed for the largest clinical collections.

It must be emphasized, however, that the particular system of classification adopted is not as important as the fact that any library larger than a certain minimum size has to be organized if any one other than the person who has seen to amassing it is to make maximum and effortless use of it. Systematization and order are requisites to all intellectual housekeeping.

18 West Washington Street.

Red Blooded Young People

A prime fascination of medicine is that it is a never ending study. Merely not to forget what you have learned cannot keep you ready for the obligations of medicine. Without forgetting anything that you learn in medical school, soon as physicians, surgeons, specialists, etc., you will become hopelessly behind the times, unless you continue to study. Not forgetting will not keep you from rapidly losing out in medicine; what you may know soon is apt to be completely outmoded by new discovery. In your medical school days, I dare say, this idea of a never ending study did not seem such a joy. However, how dull a profession medicine would be if in a four years study in the medical school you had learned all that was needed to practice the profession the remainder of your lifetime. That sort of a profession would not attract into it red blooded young people.—Christian.
Henry A.: *The Lure of Medicine*, Virginia M. Monthly 65:515 (Sept.) 1938.

Comments and Reviews

THE PRACTICE OF MEDICINE

Abridgment of an address by Dr. Rufus Cole, delivered at the commencement exercises of Cornell University Medical College, June 15, 1938, and published in Science, Oct. 7, 1938.

The subject of medicine is sufficiently important and the knowledge concerning it sufficiently well organized to justify its designation as a science, and its devotees are worthy to be called scientists. Under these circumstances it seems that medicine would be a proper subject to be taken into the university as a discipline worthy to be studied, even if all applications were entirely lacking.

The question remains whether there are reasons why future practitioners should pursue the subject from this point of view. It is possible that a student might, through repeated observation and didactic instruction, become familiar with the characteristic features of disease, that he might learn empirically the procedures employed in treatment and that he might through experience alone acquire skill in prognosis. Formerly this was about all that was attempted in the training of physicians. But the university and society at large now demand that physicians shall be familiar with what is known about the nature of the processes constituting disease and of the lesions associated with them. The phenomena of disease are natural processes occurring in conformity with the laws of nature, and these phenomena can be understood only by using methods universally employed in revealing the mechanisms of other natural events. These are the methods of science. Now are you trained physicians ready for practice?

You may have knowledge of the structure and functions of the human organism in health. You may be able to picture at a moment's notice the characteristic lesions of all diseases, to pass a perfect examination on the functional disturbances produced by all types of injurious agents, and yet you may not be a good physician. There is such a thing as the technic of practice and this technic you cannot learn in the true university medical school. No one except the self-deluded men who examine you for license to practice expects you on graduation to be proficient practitioners. This does not mean, however, that you are not well prepared to master the technics necessary to make you good physicians.

It is not easy to differentiate between the study of the science of disease and the practice of medicine. The practitioner is primarily interested in the diseased individual and he must concentrate attention on those features the importance of which has been demonstrated. The university student may spend days in the

investigation of a single case. The practitioner must investigate, judge and act quickly. The university lays stress on complete understanding; practice lays stress on skill. It is not a question of treatment. The patient no longer employs a physician merely to have him administer remedies. But what he rightly demands, first of all, on the part of the physician is understanding of his entire constitution as an individual. The university student and the practitioner both are interested in treatment, but the practitioner is especially concerned with the technics employed in the individual case. Whatever the differences, the university student and the practitioner must both employ the methods of science. They must both have the scientific habit of mind, and this is especially what the university should give. Both must have curiosity, the desire to learn; both must have honesty, and both must be critical. Unverified opinion can have no place as guides to action.

If you have not yet acquired the technic and skill for practice, how are you to get it? It can be acquired only by practice itself and by hard unremitting labor. In earlier years the rudiments of the technic of practice were obtained by following a preceptor and, so far as it went, this was not a bad way.

THE WEAKEST LINK

Today the preceptor system has been replaced by the hospital internship and there are defects in the intern system. It is the weakest link in present day medical education. In most cases all the hospital does is to offer opportunities to the intern. The preceptor cared whether the student did or did not learn, the hospital usually does not care. But hospital physicians can be interested in the training of interns, to their own as well as to the student's great advantage. Hospital authorities can undertake more seriously their educational responsibilities.

In the first place the hospital can realize that its interns are highly educated, cultivated, serious men whose ambition is to serve the patients under their care and whose greatest desire is, through practice, to become technically skilful, more gentle, more humane, more wise. The hospital can provide facilities so that interns may live like cultivated men and students; this does not mean provision for higher standards of living but for higher standards of work and study. When visiting hospitals I have made a point of seeing the interns' rooms. Even in some of the most modern hospitals I usually find small, dark rooms, containing a bed, a chair or two, a small desk and a few books, and these mostly textbooks, remnants of the student life. I was surprised to find no evidence of any interests at all, even in science. To find that a

young man could have acquired a university degree and have no interests outside his daily job was a surprise. The hospital cannot create these interests but it can assume that the intern has them. The hospital should not treat interns as employees and provide to the minutest detail the kind and amount of work they shall perform. Interns must have freedom. This in large hospitals is difficult but not impossible.

I recall experiences under Osler. He was personally interested in every intern, considerate of their sensibilities and their time; he seized on the least evidence of curiosity in an intern, stimulated his interest and aided him with advice and help. His contacts with his interns were not confined within the wards. He never missed a meeting of the hospital medical societies. Above all he influenced the interns by his example. He taught them to become good doctors by being one himself. All practitioners connected with large hospitals come daily into contact with the interns. By spending a limited amount of time with them, by guiding them, by working with them, these practitioners may be of great educational service. Practitioners in a small place have the same opportunity to become great teachers as had Daniel Drake in the little Transylvania University beyond the mountains.

After all, whether interns become good doctors or not depends on the interns themselves. Our hospitals have arrangements for making all kinds of technical investigations. The intern becomes a part of this organization and he is able to use any one of a dozen different laboratories to aid him. This is useful but it carries with it dangers. The student begins to deal with formulas, with words, instead of with the things themselves. One of the chief disadvantages of the present arrangement is that when the intern becomes an independent practitioner this convenient arrangement will no longer be available to him. Aid he must have but it must be carefully chosen. At present a large part of the work of contributing services in the hospital is probably unnecessary. This results from the fear of omitting something. It is this fear of omission that impels taking the most minute and extensive histories and the recording of routine elaborate physical examinations, all of which occupy much of the intern's time and leave little opportunity for thinking and independent action. How many interns keep their own records of cases, classify them, think over them, formulate their own concepts and try to rationalize the methods of treatment they employ? Records of cases carefully abstracted, compared and digested are of greater educational value than random experiences, however exciting. To pass through your intern years in a fever of agitation, interested only in obtaining a rapid series of impressions, will add

little to your real experience or improve your training for practice.

When I contrast the long lists of interns and residents in hospitals today with the handful of workers forty years ago, I cannot believe that the intern's life need be more strenuous today. The master word in the hospital, as in the university, is still Work.

Hospital days should be laborious days, but they may be also days of the greatest joy. For the first time you will come into a position of real responsibility for the lives of your patients. It is a cold individual who is not moved by this close contact with those in distress.

During the internship, the hospital should be your home, your workshop and your playground. Shun outside affairs that will complicate your life and disturb concentration on your work, rejoice if you are too poor to own an automobile to carry you from the straight road, avoid the movies, above all avoid entangling affairs of the heart.

A SCIENTIFIC ATTITUDE

The difficulties of maintaining a scientific attitude will be enormously increased once you have left the protecting walls of the hospital. Amid the distractions of domestic life, the competition in professional work, whether you will be able to continue to exercise the scholarly and scientific point of view will depend largely on the use you made of your hospital years. The best guard against retrogression is a constant desire to learn more about the real nature of disease and particularly about some one disease. Some of the most important medical discoveries have been made by men in active practice. The late Dr. Meltzer's example should impress you. For many years he drove about New York every day with a horse and buggy seeing patients and then spent all the time he could in a laboratory, during which period he made important contributions to medicine and physiology. After the Rockefeller Institute was established he went there to work. He died one of the most productive students of disease that our country has had.

The practice of medicine today is far better than it was forty years ago. Some put the blame for the defects on the present method of university education.

In interviewing students I frequently stand amazed by the fluency and skill with which they discuss the most complicated subjects of physiology and pathology and the latest discoveries in medicine. I sometimes wonder, however, whether the facts have been digested and transmuted into wisdom. A doctor should never be ignorant of any fact relating to medicine. But is this cramming scientific education or does it produce scientists?

Let the university heed that it turns out men who have the scientific habit of thought, not

merely men stuffed with facts; however, if the prevailing standards of practice do not fulfil expectations, let us not place the blame for it all on the university. The hospital, the visiting physicians and even the interns and practitioners themselves play parts in the training of good physicians.

We are still far from perfect. The future rests with you. May you continue to be scientifically and critically minded. May you continue to be students as long as you live.

THE ORIGIN OF THE MICROSCOPE

Abridgment of a paper by Dr. Russell L. Haden, published in the Annals of Medical History, January 1939.

The name microscope was suggested by a physician; three of the five great microscopists of the classical period were physicians; one of the first applications of the microscope was the study of medical problems by a physician. The microscope is an application of the science of optics. Books on optics were written by Euclid 300 years before Christ. The first person to mention the actual use of lenses for a definite purpose was the English monk Roger Bacon (1214-1294), who was the initiator of experimental physics.

The first important application of magnifying lenses was in spectacles, which were invented independently in Italy at about 1285 by Salvino degli Armati. An inscription in the church of St. Maria Maggiore in Florence says "Here lies Salvino degli Armati of Florence, inventor of Spectacles. May God pardon his sins. MCCCXVII." Perhaps the allusion to his sins refers to the fact that he kept secret the method of making spectacles.

The possibility of combining lenses for distant vision and for high magnification was discovered later and thus the telescope and compound microscope were invented. The discovery of both the telescope and the microscope belongs to Holland, although the first significant observations with both instruments were made in Italy.

The inventor of the compound microscope seems to have been Zacharias Janssen, who with his father was a spectacle maker in Middelburg in the Dutch province of Zeeland. Janssen discovered in 1590 how to combine convex lenses in a tube to make an instrument for magnifying minute objects and so invented the microscope.

Probably the oldest compound microscope in existence is now in the museum of the Zeeland Scientific Society of Middelburg. Harting, after a careful study, concluded that it is probable that this instrument was made by Janssen. Its greatest magnification is 9 diameters.

One of the most noted of the early microscope makers was Eustachio Divini. A Divini microscope made in 1672 is now in the Museo di Fisica, Padua. Another famous maker of compound microscopes in Italy was Joseph Campani of Bologna, a contemporary of Divini. Little was done in England in the way of making instruments until Robert Hooke in 1665 described his compound microscope. Hooke's microscope initiated a new era in microscopy. He ground his own lenses, constructed his microscope, made observations with it and drew his own remarkable illustrations. A microscope of this pattern used by Hooke is now in the South Kensington Museum in London. The compound microscope remained optically about as Hooke left it for more than a hundred years.

Leeuwenhoek excelled all other early workers in making simple microscopes because of his skill in grinding lenses. He never described his method of grinding. When he died in 1723 he bequeathed to the Royal Society of London a cabinet containing twenty-six microscopes equipped with double convex lenses magnifying from 40 to 160 diameters. Leeuwenhoek at his death had 247 complete microscopes and a total of 419 lenses. His observations were first communicated to the Royal Society of London by letter in 1673.

The most successful of all early simple microscopes is associated with the name of Wilson, although not original with him. This type was first made by Tortona. Wilson's microscope was first made in 1702.

The further development of the compound microscope is due largely to English instrument makers. The next important microscope after Hooke's was made by Marshall in London in 1693 with a magnification up to 100 diameters. Culpepper in 1730 suggested the three pillar type of stand. He also used a concave mirror in the optical axis of the instrument. Focusing was done entirely with the draw tube. The Cuff microscope first made in 1744 includes most of the features of the modern microscope. With this microscope the origin of the compound microscope may be said to end. The later history is one of development.

The most active early investigators with the microscope were members of the Academy of the Lynxes (Accademia di Lincei) in Rome, a scientific society formed in 1603. Among the members were Galileo, Fabio Colonna, a botanist, Francisco Stelluti, a scholar and naturalist, James Faber of Bamberg, resident in Rome as physician of Pope Urban VII, Francisco Fontana of Naples, an astronomer, and Gianbattista della Porta, who probably first suggested combining lenses to make the telescope and microscope (1589). It was Dr. Faber who first suggested the name microscope in a

letter April 13, 1625, to Federigo Cesi, president and a founder of the academy. The word *perspicillum* had previously been used to designate both the telescope and the microscope. Galileo had called his microscope an *occhiale* or *occhialino*. The first plate made with the aid of the compound microscope comprised observations on the bee made by Stelluti about 1630.

The first medical work based on the use of the microscope is the "*Historiarum et observationum medico-physicarum*" by Pierre Borel, published in 1563. His "*Centuria observationum microscopiarum*" records 100 microscopic observations, mainly on minute insects. This is the first book devoted to microscopy. Borel describes how he found ingrowing eyelashes which are invisible to the naked eye and the removal of which relieved conjunctivitis. This was probably the first practical use of the microscope in medicine. Singer suggests that Cesi and Borel should be looked on as the fathers of microscopy.

The first medical illustration with the use of the microscope seems to be in an article in the *Acta Eruditorum* published in 1686 entitled "Description of a New Microscope Made by Joseph Campani and Its Use, communicated by Dr. Schelfstrateus, prefect in the Vatican Library, in a letter dated Rome, June 15, 1686." The illustration shows how the microscope was used in examining a wound.

THE STUDENT HEALTH SERVICE IN A MUNICIPAL UNIVERSITY

Abridgment of an article by Dr. Irvin W. Sander published in the Journal-Lancet, January 1939.

Strictly tax-supported municipal colleges and universities had their beginning in 1837 with the founding of the University of Louisville in Kentucky. At present about 20 per cent of college students in the United States attend municipal tax-supported institutions.

Since the beginning of the first student health service at Amherst in 1860 for the purpose of selecting students physically capable of engaging in athletics and sports, the scope of the service rendered by student health services to the student and to the school has gradually increased. The amount of responsibility assumed varies with the size of the college, its location and the underlying philosophy of its health obligation to the student. The older, larger and privately endowed schools have for the most part developed student health services which provide essentially a complete medical and surgical service for the payment of an annual fee. This broad interpretation of a college's obligation to the student is a form of health insurance.

The objectives of a student health service in a college may be outlined as follows:

1. Sufficient education and training of the student to enable him to care for his health intelligently, through hygienic and proper habits of living. The college health problem is not so much concerned with disease as with the fostering and increasing the strength of people not yet mature, so that a foundation may be laid for long, healthy lives.
2. Protection of the student body from contagious and communicable diseases.
3. Supervision of the sanitary facilities of the school buildings, dormitories and rooming houses.
4. Care of acute illness which requires emergency attention.
5. Physical examinations of all entering students to determine their fitness to participate in required courses of physical education and in the more strenuous elective intercollegiate athletics. Adequate records must be kept of all students and competent interpretation made of the results of the examination.
6. Assisting students in planning their course of study so that it will correlate with their physical and mental abilities. The prevention of overwork on the part of some students is often a necessity. As students seldom pay by their tuition the actual cost of education to the school, this phase of the student health service work may be interpreted as a safeguard of the capital investment of the institution. There is no economy in graduating students who will be shortly compelled to withdraw from the practice of their profession because of illness due to poor supervision of their health habits while attending college.

Fundamentally, the problems of the student health service in a municipal university are the same as in any school of higher education. The students are of the same age group and are no better nor any less prepared for college life than students of other schools. There is, however, less need for the broad administrative development of the health service in the municipal school that is found in the larger endowed school. Many of the city colleges have no dormitories; the few students attending the school from out of town find their own accommodations. As the school district is in a city, these rooming houses will be supervised by the local department of health and should not constitute a health problem to the university.

The fact that most students in a municipal university live at home makes the handling of their health a different problem than in the ordinary school. There will in most cases be a family physician who has cared for the student during previous illnesses and who has a better knowledge of the personal and family history than the student health service physician could hope to learn with his brief contacts. There is no logical reason why the family physician should not continue to care for such a student in the same manner he would have if the student had not enrolled in the university. The same thing may be said of hospitalization of a student.

The few cases of out of town students in the city university who require hospitalization can be cared for in an emergency by sending them

to the city hospital. The school is in this way saved the expense of erecting and maintaining an infirmary for ill students. This will perhaps make the health service less adequate in caring for the students than it might be; but, in general, local facilities will be sufficient to care for the few cases in which the school must assume some degree of emergency responsibility.

Wayne University, operated by the board of education of the city of Detroit, was formed by the union in 1934 of five colleges operated by the board. The Student Health Service was first organized in 1928 as part of the College of Arts and Sciences. Thorough physical examinations are made of all entering students, who are graded in accordance with the results of their physical examinations, and permission is given or withheld for participation in athletic activities. College sports are supervised by the health service and a physician is in attendance at all football games. Since its inception, the Student Health Service has become of increasing value to the students of the university. All physical defects found during the examinations and needing correction are referred to the parents and the family doctor for appropriate care.

The students of Wayne University are not given medical care within the usual meaning of that term. Emergency care is given, but subsequent treatment, if necessary, is referred to the family physician. Athletes competing or trying out for teams representing the university are given medical care to the extent of the facilities of the health service in the event of injury. When such facilities are

inadequate, the student is referred to the family physician or to an appropriate specialist. In circumstances in which it is deemed advisable, the physician's fee is paid by the university. No hospitalization is offered to the students by the health service. A few beds are kept in readiness in the health service building for emergency illness, but the student is kept there only until arrangements are made for his removal to the home or to a hospital if necessary. These beds are available also to students assigned to regular rest periods during the day because of chronic ill health.

Education of the students in matters of health and hygiene is considered the main objective of the Student Health Service of Wayne University. An attempt is made during each personal interview to give authentic advice regarding personal health problems to the end that the student may better understand what can be done and where such aid may be obtained. During the past year 2,080 students were referred to their own doctors or dentists for appropriate care and, when the student had no family physician, aid was given in selecting one appropriate to the need from a list approved by the Wayne County Medical Society. It is felt that the student completes his four years in college with a better understanding of what medical science has to offer and a knowledge of how to utilize that information for his own benefit. He should by that time be on good terms with his family doctor, and every such contact made should be to the benefit of medical science, the physician and the patient.

Correspondence

UNEMPLOYMENT AND THE PUBLIC HEALTH

To the Editor.—I am a senior medical student expecting to graduate in June of next year. From my conversations with classmates I believe that a large percentage of medical students are aware of some rather distinct discrepancies between the things we have been taught in medical school and the things which we observe in the actual practice and interests of the profession.

First, we are taught—and for that matter have come to medical school believing—that the chief obligation and interest of the physician lies in the preservation of the health of the people of his country. One might almost say that the sole social justification for the existence of the medical profession in this country lies in the extent of its execution of its alleged purpose in striving to keep the health of the American people as high as is possible and consistent with our present medical knowledge.

Second, we learn that among the most important causes for a number of important diseases today—tuberculosis, rheumatic fever and others—are the social-economic factors of inadequate living standards.

The entire nation is now in the midst of a critical situation brought about by the merciless cuts in relief

and public works budgets in the face of an economic situation which cannot reabsorb even a small fraction of the unemployed. We are daily faced with a rising incidence of conditions either directly or indirectly resulting from malnutrition and lowered living standards among a sizable percentage of the American people. As this situation continues, I am reasonably certain that we medical students are not alone in questioning the value of, or the justification for, the practice of medicine when the medical means which the physician has at his disposal cannot begin to touch the underlying cause of many of the cases of illness current today.

The medical profession constitutes a rather powerful political pressure group. It seems to me that, if the profession is to be consistent with its teachings and traditions, it is obligated to take up the fight for increased relief budgets and for socially responsible public works programs until a more fundamentally sound "prosperity" can be achieved. Medical care can be of little real value to several million people forced to eat on fifteen cents a day.

JAMES S. MAY, Rush 1940.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

The Victor C. Vaughan Dormitory at Ann Arbor

The Victor C. Vaughan House, the new dormitory for medical students at the University of Michigan, Ann Arbor, was opened for use at the beginning of the new academic year. One of a group of dormitories built recently at Ann Arbor, it offers accommodations for 139 medical students. The staff of the Victor C. Vaughan House includes a resident adviser who acts as an overseer of student life, three assistant resident advisers and a director-dietitian. The resident adviser is Dr. Henry S. Emerson, instructor in anatomy. The dormitory was named in honor of Dr. Victor C. Vaughan, who was for many years dean of the University of Michigan Medical School.

Beginning a New Year at Jefferson

The 115th annual session at Jefferson Medical College of Philadelphia was inaugurated September 20. Robert P. Hooper, president of the board of trustees, presided and the introductory lecture was delivered by Dr. David M. Davis, professor of genito-urinary surgery, on "Self-Reliance and the Medical Curriculum." The total enrolment is 498, of which number 145 are new students (135 admissions to the first year class and ten admissions to the third year class). The members of the first year class were prepared for medical study in sixty different institutions. Thirty-two states, Puerto Rico, Hawaii, Persia and Korea are represented. Announcement was made of the election of Dr. James R. Martin as James Edwards professor of orthopedic surgery, succeeding Dr. J. Torrance Rugh, who was made emeritus professor.

Medical Students' Musical Fraternity

The musical group at the University of Illinois College of Medicine in Chicago was first organized in 1931. After a few years this group was founded as a musical fraternity, Phi Mu Phi. The *Illini Scope* claims that this organization is the only musical organization in a medical school in the United States. A medical school in another state has requested permission to inaugurate the Beta chapter of Phi Mu Phi.

Family Doctors and Scholarships at Tufts

The award of four Commonwealth Fund scholarships to incoming students of Tufts College Medical School, Boston, was announced September 20 by Dr. A. Warren Stearns, dean. These provide \$1,000 a year to one resident of each of the four northern New England states, on condition that the recipient agrees to practice in a rural community in his state for at least three years following two years' internship after graduation. The scholarships were awarded to George L. Cushman, Medford, Mass.; Eugene H. Wozmak, East Jaffrey, N. H.; Charles R. Blackburn, Brattleboro, Vt., and Stanley W. Staples, Gardiner, Maine.

The Charles P. Thayer Scholarship and the Elizabeth A. Riley Scholarship for second-year women students were awarded respectively to Miss Victoria L. Maxwell, Mamaroneck, N. Y., and Miss Winifred Sanborn, Boscawen, N. H.

Tufts College Medical School, which is one of three medical schools in the country chosen as recipients of the Commonwealth Fund scholarships, draws its stu-

dent body largely from the colleges of New England. The announcement says that of 6,000 physicians trained in New England and settled in New England communities since 1900, one in three is a Tufts graduate.

Louisiana's Graduating Class

Of the sixty-two fourth year students of the School of Medicine of Louisiana State University who received the Bachelor of Medicine degree at the university commencement in Baton Rouge May 29, forty-six were from Louisiana. Twenty-seven already had the Bachelor of Science degree, eight the Bachelor of Arts degree, one the degree of Doctor of Dental Surgery and another the Doctor of Philosophy degree. The five students in the class who made the highest grades are, in the order of their standing, Joseph D. Lea, New Orleans; Samuel Zurik, Brooklyn; Eustace V. Chauvin Jr., Lafayette, La.; Robert B. Morrison, Austin, Texas, and Melville Rosenbusch, Richmond Hill, N. Y.

Loans to Students at Harvard

Funds have been established at Harvard Medical School, Boston, to which students in need of money may make applications for loans. Amounts up to \$400 may be loaned to a student during any one year and up to a total of \$1,000 during the course. Application should be made by May 15, but in an emergency it may be made at other times. Notes are payable two years after graduation and 5 per cent interest is charged. Loans are made to students in the second, third and fourth year classes whose records are sufficiently creditable to make it probable that they will remain in the school and will be able to repay the loan at the time arranged for. Recent matriculants may apply for their loans only in their second half year. Loans are rarely made to married students. Among the various loan funds are the David L. Edsall Revolving Loan Fund, the Charles William Eliot Loan Fund, the John Foster Fund, the Loan Fund of the Medical Class of 1879. Application should be made at the office of the dean of the medical school.

Harvard also has a great many scholarships to offer in the way of rewarding and aiding medical students. Most of these scholarships are open only to students who are members of the school at the time of application; however, in order to make it possible for young men of great ability and promise to come to Harvard Medical School, one or two Harvard Medical School National Scholarships are offered to incoming members of the first year class. The stipend carried by these two scholarships is sufficiently large, if necessary, to meet all the student's essential expenses. Successful applicants who maintain a high honor record at the school will continue to hold these scholarships throughout the course at the medical school. These scholarships are made possible by gifts from Edward S. Harkness and Dr. Daniel F. Jones. Direct application for these scholarships cannot be made, since all accepted first year students are considered candidates and the awards are made without reference to financial circumstances.

Harvard has available also fellowships for the purpose of aiding students, graduates or teachers in research or postgraduate study. Applications concerning all the foregoing should be made to the office of the dean, Harvard Medical School.

Medical Murals Presented to University of California

Murals depicting the history of California medicine were presented to the University of California at a special ceremony recently in the university hospital. The murals occupy all the free portion of the circular wall in Toland Hall above the demonstration pit. One wall shows the development of medicine in northern California and the other in southern California. The earliest Indians are seen emerging from their sweat houses, or being worked over by the medicine man. Gold rush medicine is the subject of a mural in the central background. Dr. Don Pablo Soler, Spanish surgeon of the late eighteenth century, is seen attending an Indian. The transition from these early crude forms of medical attention to the scientific procedures of today is skilfully made by the artist. Another central panel shows the first hospital of California, a crude shelter put up at San Diego in 1789 to succor members of the Portola expedition. The incident of James Ohio Pattie, old California trapper, vaccinating a number of early Californians against smallpox is also shown.

Dartmouth Personal

Donald deForest Bauer, Brooklyn, a sophomore at Dartmouth Medical School, Hanover, N. H., has been awarded a Mellville Cramer Foundation Fellowship and will study genetics at McGill University, Montreal, where he will be a candidate for a doctorate in both medicine and philosophy. Mr. Bauer is the son of Dr. John L. Bauer.

Loan Funds at Emory University

Emory University, Atlanta, Ga., has a number of loan funds which are used to assist worthy students, about which information may be obtained from the dean of men. It is difficult, however, to secure loan funds for students of medicine in the university except during the junior and senior years, on account of the length of time necessary for medical students to remain in school. The demand for assistance is greater than can be met by these funds, and a student who is able to do so should make previous arrangements for financial aid. University bills for tuition, fees and dormitory are payable by the quarter in advance. There is a matriculation fee of \$5, payable only once. A student activities fee of \$4.50 is collected quarterly, and the charge for tuition and fees is \$112.50 a quarter. Each student must keep on deposit a damage deposit fee of \$5 to guarantee against loss or damage of university property entrusted to him. Each student must provide himself with a microscope.

The charge for a single room in Dobbs Hall by the quarter is \$30. Meals may be obtained in a cafeteria on the campus at from \$17 to \$25 a month.

Loan Funds at Marquette

The Father Noonan Student Aid Society administers a loan fund which is available only to seniors. The Mary Connor Student Loan Fund was established by the Wisconsin Council of Catholic Women for the assistance of women students and is ordinarily available only to juniors and seniors. Information may be obtained regarding these funds from the dean of men and the dean of women respectively. The university has a residence hall for women students from out of town known as the Alumni House and also a social center for women students known as Drexel Lodge, the latter providing study, rest and recreation rooms and facilities for serving luncheons. The Marquette Union is available for male students of the

entire university. It provides a lounge, billiard room, banquet hall, refreshment counter, cafeteria and reception room. The union aims to foster genuine democracy among the students, to develop their sense of responsibility, to promote their powers of self government and to cultivate the social factors of harmony and refinement.

Estimate of Expenses at Marquette

Following is an estimate of about the lowest figures on the expenses for the school year at Marquette University School of Medicine, Milwaukee:

Tuition and fees.....	\$450
Board and room.....	270
Laundry	50
Books and stationery.....	75
Microscope, per year (if purchased on instalment basis)	35
Incidentals	30
Total	\$910

Portrait of Irvin Abell

At the graduation banquet of the University of Louisville School of Medicine, Louisville, Ky., the class of 1939 presented to the school an oil painting of Dr. Irvin Abell. Dr. Osear O. Miller presented the painting, which was received by the dean, Dr. John W. Moore.

Student Health Service at Indiana

With the opening of the 1939-1940 school year, a student health and medical service was established at Indiana University, Indianapolis. Dr. Willis D. Gatch, dean of the Indiana University School of Medicine, has been named director of the program. The service will provide clinical facilities for all students in the university with attendant physicians and nurses, twenty-four hour provision for emergency calls, an x-ray laboratory, beds for observation cases and hospitalization.

Scholarship Available for Freshmen at Alabama

The local chapter of Phi Beta Pi medical fraternity has established at the University of Alabama School of Medicine, University, Ala., an annual scholarship of \$90 to be awarded to some worthy freshman who has matriculated by May 1 for the next regular session of the school of medicine. A committee of Professors Carmichael, Foley, Goss, Graves, Hunt, Jeller and McBurney was nominated to make the award. For guidance of the committee the donors made the following statement:

In making the award, it is the sentiment of the donors that the previous scholastic record and other qualifications of any student shall have been such that the award would be granted to a student who gave promise of a successful career in medicine; and finally, other things being equal, the award should preferably be given to a student, man or woman, who needed financial aid.

Research Assistantships at Louisville

Research assistantships of \$135 each are allotted annually to seven students at the University of Louisville School of Medicine, Louisville, Ky., who distinguish themselves in research. Preference is given to candidates for graduate degrees.

Expenses at Vanderbilt

The average annual expenses of a student at Vanderbilt University School of Medicine, Nashville, Tenn., exclusive of clothes and incidentals, are estimated at from \$800 to \$1,000. Among the items the sum is the tuition fee for the year of

fee of \$10, a diploma fee of \$5, a fee for the support of the Student Union of \$5 and, for the fourth year students, a rental charge of \$2 for academic hoods at commencement. Each student is required to possess a standard microscope, but to aid first year students in purchasing one the school will advance three fourths of the purchase price, to be repaid in three equal instalments at one, two and three years after the date of purchase. The necessary books cost about \$50 a year. All students are required to provide themselves with hemocytometers and hemoglobinometers before the beginning of the second trimester of the second year.

Tests for Premedical Students at Minnesota

The Minnesota Medical Aptitude, the Strong Vocational Interest, and the Sophomore Culture Tests must be taken at the end of the second premedical year or in the first quarter of the third year. Students at the University of Minnesota may take these tests on the campus at a time to be announced in the official bulletin. Students in other colleges and universities should communicate with the University Testing Bureau to make arrangements for taking these tests. Fees are payable by the applicant.

The National Medical Aptitude Test is given in December of each year at the various universities and colleges of the country. It is best taken during the second or sophomore year in college.

Scholarships and Medals at Vanderbilt University

A Founder's Medal is awarded to the student in the graduating class of Vanderbilt University School of Medicine, Nashville, Tenn., who has attained the highest average standing in scholarship throughout the four consecutive years of study.

The Commonwealth Fund provides an annual grant as a scholarship fund for deserving medical students. The terms require that a student who receives such consideration shall agree to practice as much as three years in a rural area in Tennessee after graduation and after having served an internship of not less than two years. These scholarships may be renewed for each of the four years of medical study, but only bona fide residents and natives of Tennessee are eligible. Application blanks, which may be obtained from the registrar at the school of medicine, should be filed prior to March 1.

The Beauchamp Scholarship is awarded to the student showing the greatest progress in the department of neurology and psychiatry and who is otherwise worthy and deserving.

The Dr. Ben Witt Key Annual Award, amounting to \$500, is made to the fourth year student who is among the five highest in scholarship and judged by the faculty to be outstanding in scientific ability, in character and in personality.

Internships in Baylor Hospital

Each year thirteen members of the graduating class of Baylor University College of Medicine, Dallas, are awarded internships in Baylor Hospital on their scholarship standing and personal fitness. This is a one year internship beginning July 1 and, according to the official bulletin of the university, offers exceptional opportunities for a broad clinical training in the treatment of a great variety of diseases. The 400 bed Parkland Hospital, which is jointly controlled by the city and county of Dallas, offers a combination graduated service of internship and residency extending over a period of two years.

The Opening of School at Ann Arbor

The ninetieth annual opening of the University of Michigan Medical School, Ann Arbor, was held in the School of Graduate Studies, September 25, on which occasion the president of the University of Michigan, Dr. Alexander G. Ruthven, introduced Dr. Francis E. Seneer, of Chicago, who spoke on "Some Phases of Medical Education and Practice." A graduate of the University of Michigan Medical School, Dr. Seneer has been head of the department of dermatology at the University of Illinois College of Medicine, Chicago, since 1925, and during the past year was president of the American Dermatological Society. Following the convocation address, Dr. Seneer was granted the honorary degree of Master of Arts. At this time, also, the Sternberg Medal was awarded to Dr. Malcolm Block, of the class of 1939, for outstanding work in medical research and high scholarship.

Interns' Organization

The annual meeting of past and present interns of the San Diego County General Hospital was attended June 22 at the Emerald Hills Country Club by thirty-five physicians. Dr. Alfred J. Cooper acted as chairman, and a permanent organization was formed with Dr. Alexander M. Lesem, president. An appropriate greeting was voted for the incoming interns.

Transfer of Students from North Carolina

Only the first two years of the medical course are given at the University of North Carolina School of Medicine, Chapel Hill. It is necessary for the students to go elsewhere for the remainder of their studies. Following are the transfers which the students have made for the year beginning in September 1939:

Jesse Appel, Brooklyn, to New York University College of Medicine, New York.

Ralph M. Bell, Mooresville, N. C., to Jefferson Medical College of Philadelphia.

Daniel H. Buchanan, Chapel Hill, N. C., to Harvard Medical School, Boston.

Jesse B. Caldwell, Cramerton, N. C., to McGill University Faculty of Medicine, Montreal.

Henry T. Clark, Scotland Neck, N. C., to the University of Rochester School of Medicine, Rochester, N. Y.

Charles E. Cloninger, Claremont, N. C., to the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

Joseph B. Crawford, Goldsboro, N. C., to Jefferson Medical College of Philadelphia.

Alfred M. Elwell, Camden, N. J., to the University of Pennsylvania School of Medicine, Philadelphia.

Benjamin F. Fortune, Greensboro, N. C., to Jefferson Medical College of Philadelphia.

Eugene F. Hamer, McColl, N. C., to the Medical College of the State of South Carolina, Charleston.

Pearl Huffman, Morganton, N. C., to the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

Gilmer Mcbane, Chapel Hill, N. C., to Harvard Medical School, Boston.

Ralph S. Morgan, Penland, N. C., to Rush Medical College, Chicago.

Max M. Novich, Newark, N. J., to the University of Louisville School of Medicine, Louisville, Ky.

Irene Phrydas, Greensboro, N. C., to the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

Edwin A. Rasberry, Snow Hill, N. C., to the University of Pennsylvania School of Medicine, Philadelphia.

Maek Simmons, Chapel Hill, N. C., to the Medical College of the State of South Carolina, Charleston.

Emmet R. Spicer, Goldsboro, N. C., to Cornell University Medical College, New York.

Robert L. Stricker, Asheville, N. C., to the University of Pennsylvania School of Medicine, Philadelphia.

Edmund R. Taylor, Chapel Hill, N. C., to Johns Hopkins University School of Medicine, Baltimore.

Thomas G. Thurston, Taylorsville, N. C., to Harvard Medical School, Boston.

James L. Wardlaw Jr., Calypso, N. C., to New York University College of Medicine, New York.

Samuel B. Willard, Doylestown, Pa., to Long Island College of Medicine, Brooklyn.

Milton H. Yudell, New York, to Rush Medical College, Chicago.

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RIBOFLAVIN DEFICIENCY IN HUMAN SUBJECTS

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AUGUSTA, GA.

The possible relation of riboflavin deficiency to certain manifestations of human pellagra has been of interest to investigators of various deficiency diseases for a number of years. During 1935 and 1936 at least four groups of observers¹ treated small groups of pellagrins with relatively minute doses of riboflavin with no evidence of curative effect. Our own experience with four patients treated with 3 mg. of lactoflavin a day for five days was entirely negative. Sebrell, Hunt and Onstott² observed no improvement in dogs with experimental blacktongue given relatively large doses of riboflavin by mouth. Nevertheless the close similarity of the mode of death of dogs with experimental riboflavin deficiency with that in fatal human pellagra and the constant finding of extreme fatty degeneration of the liver in the two conditions seemed to point to some significant relation.

No clinical sign of human riboflavin deficiency had been recognized until Sebrell and Butler³ in 1938 called attention to the incidence of "cheilitis" in a number of patients maintained under experimental conditions on a diet poor in riboflavin; this condition was cured by riboflavin. The "cheilitis" described by Sebrell and Butler occurs frequently in endemic pellagra and has commonly been considered an accessory sign of the pellagrous syndrome. Stannus⁴ many years ago described it as "marginal stomatitis." The lesions consist of redness, desquamation and finally ulceration of the lips at the mucocutaneous junction with fissures or "rhagades" at the corners of the mouth; either or both may be present. A number of Sebrell's experimental subjects presented these phenomena before any frank signs of pellagra were evident. The relation of

these epithelial lesions to the dermatitis of pellagra is of considerable interest, particularly since it has been the common experience that "cheilitis" and dermatitis heal slowly under nicotinic acid therapy of pellagra while treatment with yeast or liver extract causes rapid involution. It has also been observed that cheilitis may develop while oral and neurologic manifestations of pellagra are being cured with nicotinic acid.⁵ In some instances cure of rhagades has been observed in patients treated with nicotinic acid alone,⁵ but here the question of increased appetite with consumption of large amounts of "pellagra-producing" food containing some riboflavin must be considered. Spies and the Vilters,⁶ thought that pellagrous dermatitis in patients treated with nicotinic acid healed more promptly after the administration of large doses of riboflavin.

During the past three months six patients have been observed who showed evidence of possible riboflavin deficiency; five of these had definite signs of pellagra as well. Patient 2 was so ill that it was not considered justifiable to hold her under experimental conditions; patient 5 had diabetes and was in urgent need of control, so her diet was that required for regulation of her diabetes. The other four patients were kept on our standard pellagra-producing diet during the period of experimental therapy. Riboflavin used in treatment was the synthetic crystalline product furnished by Merck & Co., Inc., and "Lactoflavin" for injection was furnished by the Winthrop Chemical Company. An extract of liver prepared for intravenous use but lacking in hemopoietic activity was furnished by Parke, Davis & Co.

REPORT OF CASES

CASE 1.—J. A. M., a white man aged 34, was admitted Dec. 30, 1938, in severe alcoholic excitement. He was known to have been on a prolonged debauch and to have eaten little for about three weeks. There was a fine sealy dermatitis of the nasomalar grooves and alae of the nose as well as of the chin. There were deep radiating fissures at the corners of the mouth, and the lips were red and excoriated along the line of apposition. The tongue was typical of pellagra. There was slight brownish dermatitis of the hands and elbows. General physical examination as well as routine laboratory determinations showed nothing of significance. The gastric contents after histamine showed 20 degrees free hydrochloric acid and 30 degrees total acidity. He was maintained largely on dextrose solutions given intravenously and liquids by mouth for ten days, during which there was slight increase in the labial lesions and glossitis. There was no diarrhea. A pellagra-producing diet was begun Jan. 10, 1939, and on January 11, 12 and 13 the "nonhemopoietic" liver extract was given, 40 cc. intravenously each day. No effect on the glossitis or cheilitis was evident after six days. Lactoflavin was then administered

5. Smith, T. D.: Personal communication to the authors. Authors' present report.

6. Vilter, R. W.; Vilter, S. P., and Spies, T. D.: Relation Between Nicotinic Acid and a Coenzyme (Cozymase) in Blood of Pellagrins and Normal Persons. *J. A. M. A.* 112: 420-422 (Feb. 4) 1939.

From the Department of Internal Medicine, University of Georgia School of Medicine and the University Hospital.

1. Daun, W. J.: Vitamin G Complex: Nonidentity of Rat Dermatitis Due to Vitamin B₂ Deficiency and Dermatitis of Human Pellagra. *J. Nutrition* 11: 451-462 (May) 1936. Spies, T. D.: Personal communication to the authors. Fouts, P. J.; Lepkovsky, S.; Helmer, O. M., and Jukes, T. H.: Successful Treatment of Human Pellagra with "Filtrate Factor." *Proc. Soc. Exper. Biol. & Med.* 35: 245-247 (Nov.) 1936. Authors' unpublished observations.

2. Sebrell, W. H.; Hunt, D. J., and Onstott, R. H.: Lactoflavin in Treatment of Canine Blacktongue. *Pub. Health Rep.* 53: 235 (Feb. 26) 1937.

3. Sebrell, W. H., and Butler, R. E.: Riboflavin Deficiency in Man. *Pub. Health Rep.* 53: 2282 (Dec. 30) 1938.

4. Stannus, H. S.: Pellagra in Nyasaland. *Tr. Soc. Trop. Med. & Hyg.* 5: 112-119, 1912.

intramuscularly, 3 mg. a day from the 19th through the 24th. January 23 there was definite evidence of healing of the lips. This continued slowly and was complete on the 30th. During the same time the scaly dermatitis of the nose and chin resolved. Later treatment with nicotinic acid caused rapid cure of the glossitis.

CASE 2.—R. B., a white woman aged 38, was admitted Jan. 3, 1939, with a diagnosis of severe endemic pellagra. She



Fig. 1 (case 3).—Tongue on admission.

was emaciated, disoriented and slightly febrile and had severe diarrhea. There was marked fine scaly dermatitis of the nose and malar eminences without erythema. The lips showed extreme redness and excoriation along the line of closure, and there were deep radiating fissures at the corners. The gums, oral mucosa and tongue were fiery red with much superficial ulceration and gray exudate, the pharynx and visible portions of the larynx showed similar lesions and the patient was aphonic from involvement of the vocal cords. General physical examination revealed nothing noteworthy. The vagina was intensely red with much seropurulent discharge. Dermatitis of the neck, hands and feet was absent. The blood showed 10 Gm. of hemoglobin per hundred cubic centimeters, 4,100,000 erythrocytes and 7,600 leukocytes per cubic millimeter. The Wassermann reaction was strongly positive. Other laboratory examinations were not significant. It was not possible to examine the gastric contents on account of the extreme sensitiveness of the inflamed pharynx. The patient was given a soft pellagra-curative diet without yeast, and nicotinic acid was administered intravenously, 300 mg. a day from January 4 to 7; thereafter it was given by mouth, 75 mg. a day. There was the usual dramatic response of the glossitis, stomatitis and diarrhea; all were cured on the third day of treatment, and on this day the mental state seemed quite normal. The patient ate of

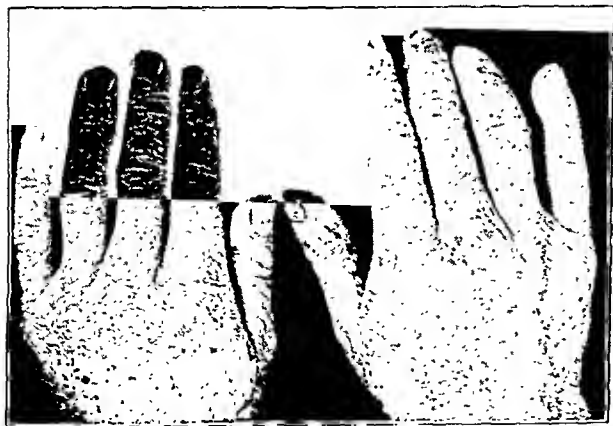


Fig. 2.—(case 3).—Dermatitis of hands on admission.

the curative diet greedily after the first day of treatment. The lips healed somewhat more slowly than the buccal mucosa, but on the fifth day of treatment cheilitis and rhagades were cured.

CASE 3.—F. P., a white man aged 54, was admitted Feb. 9, 1939, with a diagnosis of relapse of chronic pellagra; he had been seen on four previous admissions with severe pellagrous lesions. At this time there was slight branny desquamation of the nose and malar eminences, the lips and buccal mucosa were of normal color, there were no fissures at the corners of

the mouth and the tongue was of normal color and texture (fig. 1). The hands showed a bright red "dry" dermatitis with marked desquamation (fig. 2) quite different from the usual vesicular and bullous lesions present on previous admissions and the genitalia and feet were free from dermatitis. General physical examination was negative. The blood contained 11 Gm. of hemoglobin per hundred cubic centimeters and 3,000,000 red cells and 11,000 white cells per cubic millimeter. There was total achlorhydria after histamine. Other laboratory examinations were not significant. This man was of particular interest because he had been the subject of numerous therapeutic experiments and was a very labile pellagrin in whom relapse could be produced quite regularly by maintenance on dextrose and water or on a "maize diet" for five or six days. His

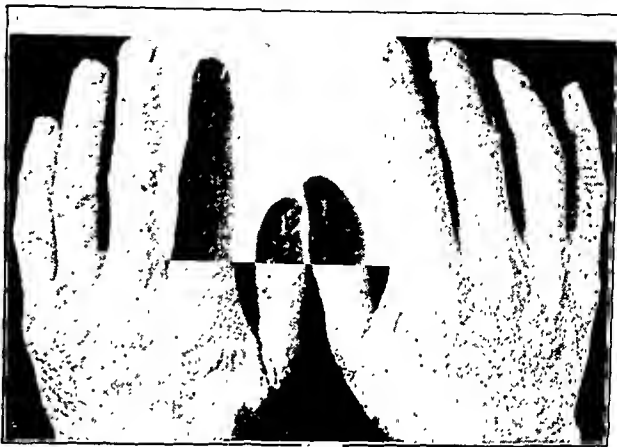


Fig. 3 (case 3).—Hands after treatment with riboflavin.

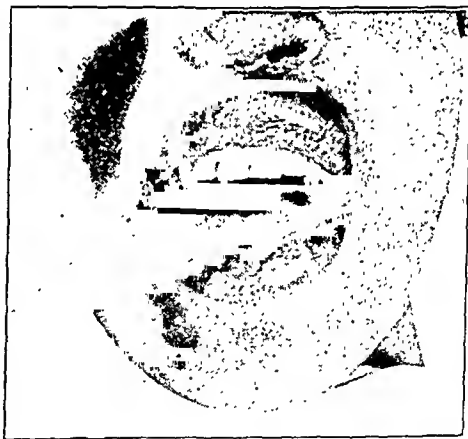


Fig. 4 (case 4).—Lesions of lips and nares before treatment.

present dermatitis was quite different from that seen on previous admissions; the usual severe stomatitis and glossitis were absent and he did not have diarrhea. He was given the basal pellagra-producing diet and riboflavin was administered subcutaneously, 50 mg. February 12, 13 and 14. No other treatment was used and from February 15 the left hand was exposed to an infrared lamp for twenty minutes twice each day. On February 16 there was definite blanching of the hands; this was progressive and by February 24 the skin was of normal color, though there was still some desquamation. In the opinion of various observers the hand exposed to heat healed somewhat more rapidly than did the other. February 27 an attempt to produce relapse was made by putting the patient on a dextrose and water diet; this was continued for five days with no effect (fig. 3). A "maize diet" consisting of 500 Gm. of cornmeal mush and syrup as desired was then substituted for dextrose and water and continued for four days without producing any sign or symptom of pellagra. The experiment was then terminated.

CASE 4.—L. J., a Negro girl aged 17, was seen Feb. 18, 1939, on account of a "sore mouth" which had developed during hospitalization subsequent to an arthroplasty of the left hip joint. For about three weeks after the operation she had refused regular ward diet and had eaten hardly anything except white bread and syrup, corn bread and syrup and hominy with gravy. She was excellently nourished and developed, afebrile and free from gastrointestinal disturbances. The palpebral and scleral conjunctivas were very red, there was a small amount of serous exudate from the conjunctival sacs, and photophobia was extreme. There was no evidence of iritis. The lips were intensely red, almost denuded, with deep fissures in the vermillion and slight fissures at the corners; the upper lip showed an oozing moist dermatitis; there was a deep fissure



Fig. 5 (case 4).—Lips and nares after treatment with riboflavin.

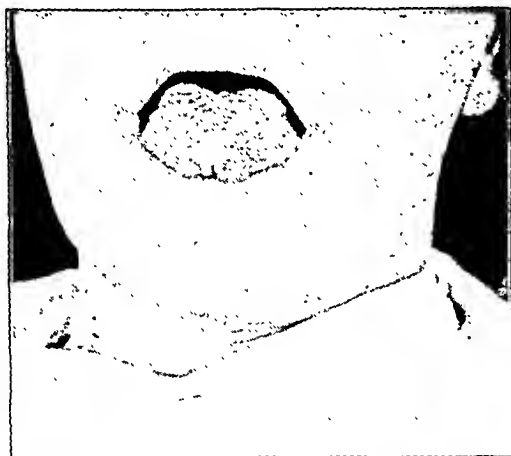


Fig. 6 (case 5).—Lesions of lips and corners of mouth on admission.

at the junction of the nasal septum and lip, and the septum and lower portions of the alae showed dermatitis similar to that on the upper lip. The skin elsewhere was of excellent texture. The tongue and buccal mucosa showed nothing abnormal. General physical examination and routine laboratory procedures were not significant. Cultures from the lips and nose showed no unusual bacteria and no fungi (fig. 4). The patient was put on a pellagra-producing diet, which she ate well, and on February 19 riboflavin was given by mouth, 30 mg. in doses of 10 mg. three times a day; this was continued until February 23. During these five days there was some improvement in the lips but none in the nasal lesion; the amount of riboflavin was increased to 60 mg. a day on February 24, and this dose was continued until February 26, at which time the lips were cured and the deep fissure at the base of the nasal septum was almost healed. Two days after treatment was discontinued there was a rapid recurrence of cheilitis and the nasal fissure reopened. On March 1 and 2

riboflavin was given hypodermically in doses of 10 mg. once a day, and by March 4 the lesions were again healed; on this occasion there was marked improvement in conjunctivitis and photophobia. On March 9 a second relapse occurred, the lips nose and conjunctivas being quite as much affected as at first. On this day 20 mg. of riboflavin was given intravenously. From this time on there was rapid healing of the lips and nose with disappearance of conjunctivitis and photophobia. On

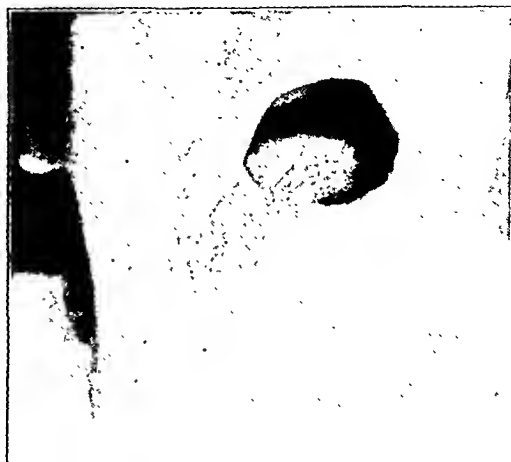


Fig. 7 (case 5).—Lips after treatment with riboflavin.

March 15 no abnormality of the lips could be seen, the nasolabial fissure was healed and the eyes were normal (fig. 5). The patient was then given a regular diet and has remained well.

CASE 5.—M. W., a white woman aged 58, was admitted March 1, 1939, with the diagnosis of diabetes mellitus. She was slightly obese, somewhat pale and had slight edema of the feet. There were deep fissures at the corners of the mouth, and the lips were red and slightly excoriated along the line of apposition (fig. 6). The tongue was bright red, atrophic and fissured. General physical examination showed cardiac hypertrophy, severe hypertension and moderate enlargement of the liver. There was vaginitis with some seropurulent discharge. The fasting blood sugar was 330 mg. per hundred cubic centi-



Fig. 8 (case 6).—Lesions of corners of mouth which developed during treatment with nicotinic acid.

meters, and 11 Gm. of dextrose was excreted in the first twenty-four hour collection of urine. She was given a diet containing 50 Gm. of protein, 50 Gm. of fat and 150 Gm. of carbohydrate, and 10 units of protamine zinc insulin was administered each morning. On the third day the lips were healed and the fissures at the corners of the mouth were dry and well covered with epithelium. The original amount of protamine zinc insulin was found inadequate and the dose was increased on March 8

to 30 units. On March 10 the fissures at the corners of the mouth reopened and were quite painful; the tongue had remained red and fissured. On March 11 riboflavin was given intravenously, 10 mg. in 200 cc. of physiologic solution of sodium chloride, and on March 12, 25 mg. was administered by the same route. The lips healed during the ensuing three days and the patient felt much better; no change was noted in the tongue (fig. 7). During this time the dose of insulin had been increased to control glycosuria and hyperglycemia until 50 units was being given daily. March 19 there was a sudden recurrence of the cheilitis and painful fissures at the corners of the mouth. Riboflavin was given by mouth in doses of 20 mg. a day for five days, and again the lips healed, though small fissures persisted in the right corner of the mouth. Nicotinic acid was then started, 25 mg. four times a day. Glossitis, which had persisted, was healed on the third day of treatment, but slight excoriation persists at the corners of the mouth.

CASE 6.—L. H., a white woman aged 68, was admitted March 8, 1939, with the diagnosis of chronic endemic pellagra. She was emaciated, pale and slightly disoriented. There was slight scaly dermatitis of the nose and nasolabial folds, small fissures were present at the corners of the mouth, the lips seemed normal and the tongue was bright red and atrophic. The skin over the dorsal surfaces of the hands was atrophic but no dermatitis was present. General physical examination showed arteriosclerosis and moderate hypertension, moderate cardiac hypertrophy and the residua of a left hemiplegia. The blood showed 9 Gm. of hemoglobin per hundred cubic centimeters, 3,800,000 red cells and 8,400 white cells per cubic millimeter. The gastric contents were achlorhydric. The patient had been seen on several occasions with various manifestations of pellagra. She was given a pellagra-producing diet, and nicotinic acid was administered intravenously, 100 mg. a day from the day of admission until March 20. Disorientation and glossitis were absent on the third day of treatment but the fissures at the corners of the mouth grew rapidly worse and by March 11 were so painful as to interfere with eating (fig. 8). Ten mg. of riboflavin was given subcutaneously on March 11, and because no effect was observed 50 mg. was given by the same route on March 13. On the second day there was much improvement in the oral fissures but by March 17 they had recurred and were painful. Riboflavin was then given by mouth, 20 mg. daily from March 17 to March 23, with some improvement. The fissures became dry and less painful but did not heal. March 20 a soft diet was given and oral administration of 100 mg. of nicotinic acid was substituted for intravenous injection. During the nine days no change has occurred in the fissures at the corners of the mouth, though there has been considerable improvement in the patient's condition.

COMMENT

Five patients who presented lesions corresponding with those described by Sebrell and Butler as being due to riboflavin deficiency have been observed; another with atypical dermatitis of the hands is included in this report. Five of these patients either showed evidences of pellagra or were known to be chronic pellagrins. Patient 2 was cured of cheilitis as well as of pellagrous lesions while under treatment with nicotinic acid and an ample diet. It seems likely that adequate intake of food containing ample amounts of riboflavin explains her recovery. Patient 4 had no sign or symptom of pellagra but showed severe cheilitis and conjunctivitis; she recovered under riboflavin, given by various routes, and twice relapsed soon after treatment was discontinued. Patient 3, who was a known pellagrins, showed no definite signs of pellagra but had an atypical dermatitis of the hands, which was apparently cured by large doses of riboflavin. Attempts to produce pellagra by severe dietary restriction were later unsuccessful. The other three patients showed much improvement of cheilitis and fissures in the corners of the mouth under riboflavin therapy, though there was a tendency to rapid relapse when treatment was

stopped. Large doses of riboflavin were much more effective in all cases and parenteral administration seemed much more efficient than oral. In every instance response to riboflavin was relatively slow, and in the presence of an inadequate diet nicotinic acid given concurrently seemed to have no adjuvant effect. One patient developed cheilitis while under treatment with nicotinic acid.

Particular interest was aroused by cases 3 and 4, in which dermatitis, cheilitis and conjunctivitis seemed to be cured by riboflavin.

A NEW METHOD OF TREATMENT OF SUBACUTE BACTERIAL ENDOCARDITIS

USING SULFAPYRIDINE AND HEPARIN IN COMBINATION: PRELIMINARY REPORT

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WITH THE ASSISTANCE OF
PAUL D. WHITE, M.D.

BOSTON

Analysis of 250 cases of subacute bacterial endocarditis with positive blood cultures for alpha (viridans) and, rarely, gamma streptococci in Boston hospitals¹ stressed the ineffectiveness of all varieties of therapy prior to the new chemotherapeutic drugs. Sulfanilamide, used in twenty-four cases, and protosil, used in five, temporarily improved a few; used in four cases, sulfapyridine, although not curative, appeared far more effective. Data that we have collected from other clinics and from one case report concerning sixty-six well studied cases in which intensive treatment was given with sulfapyridine confirm our experience that in most instances the drug lowers the temperature and sterilizes the blood stream but that these effects pass off in from a few days to a month or, rarely, more. Only in one reported case,² in which the blood cultures were positive for gonococcus and a nonhemolytic anaerobic streptococcus, was there a recovery; the disease followed its usual course in the other sixty-five.

Blood of patients with subacute bacterial endocarditis usually has a high titer of antibodies for the organisms;³ despite this fact, these bacteria will grow in the serum, but they die quickly, even in normal serum, when leukocytes are present.⁴ The streptococci lie as a rule near the periphery of the vegetation, a mass chiefly of fibrin, an ideal culture medium and protective barrier, and of platelets. Polymorphonuclear leukocytes are scarce or absent in the vegetation.⁵ At its base, fibrosis is a nearly constant finding.

By present means it appears impossible to increase the number of phagocytes and draw them into contact with the bacteria, to dissolve the vegetations or to induce granulation within them. One can attempt, however, to prevent further thrombotic deposition on their surface in order to (1) restrict the nidus and culture

From the Medical Department (Cardiac Laboratory) of the Massachusetts General Hospital.

1. Kelson, S. R., and White, P. D.: The Diagnosis, Prognosis, and Treatment of Subacute Bacterial Endocarditis, to be published.

2. Orgain, E. S., and Poston, M. A.: Gonococcal Endocarditis, with Recovery After Sulfapyridine, *New England J. Med.* 221: 167 (Aug. 3) 1939.

3. Kinsella, R. A.: Bacteriological Studies in Subacute Bacterial Endocarditis, *Arch. Int. Med.* 19: 367 (March) 1917. Wright.⁵

4. Friedman, Meyer; Katz, L. N., and Howell, Katherine: Experimental Endocarditis Due to Streptococcus Viridans: Biologic Factors in Its Development, *Arch. Int. Med.* 61: 95 (Jan.) 1938.

5. Wright, H. D.: The Bacteriology of Subacute Infective Endocarditis, *J. Path. & Bact.* 28: 541 (No. 4) 1925.

medium for bacterial growth, (2) prevent embolism from the freeing of fresh thrombus, and (3) check the growth of the vegetations so that proliferating fibroblasts may fill in the areas thus limited.

These considerations have led us to treat the disease not only with sulfapyridine, for its bacteriostatic and perhaps bactericidal action,⁶ but also with an anticoagulant, crystalline heparin,⁷ which had been shown effective and in other conditions nontoxic, was chosen.⁸

METHOD

The contents of a 10 cc. vial of heparin (10,000 units) is added to 500 cc. of physiologic solution of sodium chloride, and such a solution is given by uninterrupted intravenous drip day and night for fourteen days. The rate of flow (usually from 15 to 25 drops a minute) is carefully regulated to maintain, as well as possible, the venous clotting time (normally below twenty minutes) at approximately one hour. Clotting time is measured before treatment, twice or more the first day and then at least daily by the five tube method of Lee and White.⁹ Heparin is begun from four to seven days after sulfapyridine has been started, when nausea and vomiting have subsided and before "escape" from its effects has occurred. From 4 to 6 Gm. of sulfapyridine (with desired blood levels of 5 mg. per hundred cubic centimeters or more) is given daily by mouth before and during the use of heparin and for one week afterward—a total of about four weeks. Blood transfusions are given if there is anemia of 3,500,000 red blood cells or below. Persisting infections (including this one¹) predispose to vitamin C deficiency,¹⁰ which interferes with fibrous repair;¹¹ all patients, therefore, are saturated with 200 mg. of ascorbic acid by mouth four times a day for three days and continued on 100 mg. a day. Other added vitamins and iron are not essential to the therapy.

RESULTS

Six of our patients with subacute bacterial (*Streptococcus viridans*) endocarditis and one patient with the rarer condition of acute bacterial endocarditis caused by the same organism have received the combination of sulfapyridine and heparin. Each had had four or more positive blood cultures. They were treated in the following order:

CASE 1.—F. G., a man aged 21 with advanced disease complicating patency of the ductus arteriosus, had severe recurrent pulmonary infarction after three days of heparin (April 1939) and both drugs were omitted. He died two weeks later.

CASE 2.—E. S., a man aged 22 with a history of five attacks of rheumatic fever, resulting in great heart damage, had been ill two and one-half weeks with characteristic manifestations of subacute bacterial endocarditis. Because of a red tender joint, migratory arthralgia, prolonged auriculoventricular conduction and epistaxes, concurrent rheumatic fever was diag-

nosed¹² and further indicated by later onset of auricular fibrillation following rheumatic pleuritis. The rectal temperature (104.6 F.) fell sharply on administration of sulfapyridine (April 1939); cultures became negative. He was given two transfusions. After receiving a total of 260 cc. of heparin in fourteen days he gained strength and weight, and his temperature stayed under 100 F. for forty-five days (except for one rise of 0.5 degree F.), then rose for three days with the pleuritis. Since then, signs of rheumatic infection have recurred, and he has been kept in bed since fibrillation appeared, with persistent congestive heart failure. He has shown no evidence of bacterial endocarditis, however, since shortly after the specific treatment was stopped; since sulfapyridine has been omitted (May 19) nineteen consecutive blood cultures have been negative.^{12a}

CASE 3.—A. C., a woman aged 23 with rheumatic fever at 9 years and a slight mitral lesion, had a slowly progressing bacterial endocarditis for six months, with an oral temperature to 102 F. and splenic and cerebral embolism. Blood cultures became negative on administration of sulfapyridine (April 1939). She received 290 cc. of heparin in fourteen days. Since sulfapyridine has been omitted (May 26) all blood cultures have been negative, she has gained strength and weight (26½ pounds [12 Kg.] in three months) and has shown no evidence of the disease. She has walked since June 14, is active and at work and has no complaints.

CASE 4.—M. S., a girl aged 19 years, with three attacks of rheumatic fever and severe heart damage, had been ill three weeks. After two transfusions, sulfapyridine was begun (June 1939); the rectal temperature fell sharply from 102-104 to 100 F. or less but rose after eight days. Cultures remained positive. Heparin was omitted after forty hours because of sudden headache, vertigo and amblyopia. These conditions cleared, but five days later, after thirteen hours of heparin, she had a chill and fever and died. Autopsy showed large occipital and subdural hematomas. These were probably embolic and occurred, we believe, spontaneously, though the drug very likely increased the hemorrhage and hastened death.

CASE 5.—E. L., a man aged 41 with rheumatic aortic and mitral regurgitation, entered the hospital July 8, 1939, because of chills, high fever and prostration for one week following six weeks of malaise. The rectal temperature of 104.5 fell to normal on administration of sulfapyridine but rose after two days; blood culture remained positive. An hour and a half after beginning heparin he had a chill and high fever and went into collapse. He died seventeen hours later. Autopsy showed the typical lesion of acute bacterial endocarditis on the aortic valve. His reaction after administration of heparin, and the reactions in cases 6 and 7 were later traced to a faulty lot of the drug, which caused similar reactions in several patients with other conditions. Such reactions had not occurred previously and have not occurred since.

CASE 6.—R. M., a man aged 25 with well borne aortic regurgitation, which followed rheumatic fever at the age of 8 years, entered the hospital July 21, 1939, with bacterial endocarditis of one week's duration. The temperature fell to normal on sulfapyridine and blood cultures became negative. A chill and high fever occurred after one and one half hour's use of heparin of the same toxic lot as that noted in case 5 and after two further trials of the drug. He was therefore continued as a control case on sulfapyridine alone, but emboli occurred from time to time, anemia progressed, fever recurred and a blood culture, taken thirty-eight days after treatment was started, was positive. Ten days later sulfapyridine was discontinued and a new lot of heparin was begun without reaction; to date there has been little change in his condition.

CASE 7.—J. H., a man aged 41 with well compensated mitral regurgitation following rheumatic fever at 16, entered the

6. Marshall, E. K.: Bacterial Chemotherapy: The Pharmacology of Sulfanilamide, *Physiol. Rev.* 19: 240 (April) 1939 (see pp. 255-258). Keefer, C. S., and Rantz, L. A.: Sulfanilamide: A Study of Its Mode of Action on Hemolytic Streptococci, *Arch. Int. Med.* 63: 957 (May) 1939.

7. Heparin is obtained from the Connaught Laboratories, University of Toronto, Toronto, Canada, at a cost of \$2.72 a vial.

8. Murray, D. G. W., and Best, C. H.: Heparin and Thrombosis: The Present Situation, *J. A. M. A.* 110: 118 (Jan. 8) 1938; The Use of Heparin in Thrombosis, *Ann. Surg.* 108: 163 (Aug.) 1938. Mason, M. F.: Heparin: A Review of Its History, Chemistry, Physiology and Clinical Applications, *Surg.* 5: 451 (March) 1939; 5: 618 (April) 1939.

9. Hunter, F. T.: Laboratory Manual of the Massachusetts General Hospital, Philadelphia, Lea & Febiger, 1939, p. 25.

10. Faulkner, J. M.: The Effect of Administration of Vitamin C on the Reticulocytes in Certain Infectious Diseases, *New England J. Med.* 213: 19 (July 4) 1935.

11. Lanman, T. H., and Ingalls, T. H.: Vitamin C Deficiency and Wound Healing, *Ann. Surg.* 105: 616 (April) 1937.

12. White, P. D., and Kelson, S. R.: The Clinical Relations Between Subacute Bacterial Endocarditis and Rheumatic Fever, to be published.

12a. This patient died in congestive failure Oct. 12, 1939. Autopsy revealed an area of clearcut definitely healed bacterial endocarditis with typical vegetations, fibrous and calcified, on the chronically scarred (rheumatic) mitral valve. This healed lesion is consistent in time relationship with apparently effective treatment six months earlier. The aortic valve showed also extensive rheumatic scarring, but without any vegetations of bacterial endocarditis. The myocardium is being examined for Aschoff bodies.

hospital July 20, 1939, severely ill with bacterial endocarditis of seven months' duration. The rectal temperature, which had been spiking to 103 F., fell to normal, and blood cultures became negative following the use of sulfapyridine. He received two transfusions. Heparin of the same toxic lot noted in case 5 was begun but omitted after one hour because of a chill and fever. On the eighteenth day of sulfapyridine medication, heparin of another lot was resumed without reaction; he received 185 cc. over a seven and one-half day period (a larger supply was then lacking). Sulfapyridine was continued for two weeks longer, until September 7. His improvement has been striking. He began to walk four days later (after having been bedridden for three months) and still remains free of evidence of the disease, four weeks after stopping treatment.

Sulfapyridine was continued despite nausea and vomiting, which were severe in two cases; these symptoms gradually subsided. Lymphangitis in the region of the intravenous injection in two cases cleared with change of the site of injection and hot packs.

COMMENT

We have administered sulfapyridine and heparin to six patients with subacute and one patient with acute *Streptococcus viridans* endocarditis. Two of these patients, one with subacute (patient 6) and one with acute (patient 5) endocarditis, were able to take the heparin for only an hour and a half because of reactions to a toxic lot of the drug, too short a time to expect any lasting effect on thrombus formation. Two other patients (1 and 4) were able to continue the heparin for only three days and two days respectively because of the serious course of the disease itself, which terminated fatally in a short time (two weeks or less).

The remaining three patients were able to take the heparin for more than a week, a length of time probably adequate to produce an important effect on thrombus formation. All these three patients showed striking improvement and have been free from evidences of the disease for nineteen weeks, eighteen weeks and four weeks respectively after discontinuing treatment. With these results we contrasted 246 follow-up control cases: afebrile intervals were rare for as long as five weeks once fever had set in, and no patient, so far as we could determine, remained free from signs and symptoms for that length of time except one boy, who without specific therapy did so for a full year before he died of rheumatic fever.¹³ Our three subjects, moreover, lack the characteristics of "bacteria-free" cases.¹⁴

We recognize the possible danger of excessive bleeding incident to embolism in these cases but believe it fair to accept this risk in the face of the hopeless prognosis of the disease. The chances of healing the vegetations would seem best early in the disease when they are small. In this infection, in which exacerbations with crippling and fatal embolism strike suddenly, the earliest possible diagnosis and an attempt at early therapy are important.

The treatment which we have recounted is new and still in the experimental stage; it is not to be advised except under close and careful observation and preferably in the earlier cases or less seriously ill, and there must be no doubt about the diagnosis. It can do harm, but the possible benefit may well outweigh the risks, we believe, in this almost universally fatal disease.

13. In a recent article Dr. Joseph A. Capps (Subacute Bacterial Endocarditis Due to *Streptococcus Viridans* with Special Reference to Prognosis, *Ann. Int. Med.* 13:280 [Aug.] 1939) states that he has seen no recovery from subacute bacterial endocarditis since 1924. Kelson and White.¹

14. Libman, Emanuel: A Consideration of the Prognosis in Subacute Bacterial Endocarditis, *Am. Heart J.* 1: 25 (Oct.) 1925.

Time will show how much more effective, if any, the combined sulfapyridine and heparin therapy may be than the use of either drug alone; there are likely to be infrequent recoveries from the administration of the single drug sulfapyridine or even sulfanilamide; heparin has not yet, so far as we know, been employed alone in the treatment of this disease. Neither blind to the failures nor prematurely boastful of the apparent successes, we shall continue patiently to gather further experience to learn just how good our combined therapy may prove to be and to better its technic. This preliminary report is presented because of the interesting method of attack and because that attack has in these first few months given more promise than any other method that we have ourselves used or heard of in the past.

USE OF HEPARIN IN SUBACUTE BACTERIAL ENDOCARDITIS

A PRELIMINARY REPORT

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Recent studies from this department¹ on experimental *Streptococcus viridans* endocarditis in dogs indicated clearly that the infection persisted because the constant deposition of platelets and fibrin on the vegetation exceeded the rate at which the vegetation implanted on the valve could be sterilized. Further studies on both dogs and human beings suffering from subacute endocarditis of the *Streptococcus viridans* variety revealed that the blood did not lack the ability to destroy the organism in vitro and that its inability to do so in vivo was due to the fact that the effective agent in the blood, the white blood cell, was unable to reach the focus of infection because of the relative avascularity of the valve leaflets and the dynamics of the blood stream flowing past the vegetations.

Because of these facts it was thought possible that the prevention of new fibrin and platelet formation by the use of an anticoagulant might allow the valvular processes of repair and sterilization to gain the ascendancy and thus terminate the infection.

With this in mind, a patient was treated with new concentrated heparin, which has been shown by Murray, Jaques, Perrett and Best² to be effective in the prevention of thrombosis in animals and possibly in man, following surgical procedures. These workers have given this heparin by continuous intravenous infusion for days to many patients with no noticeable ill effects.

The following case report deals with our observations on a single patient having subacute bacterial endocarditis, who died of cerebral hemorrhage before the treat-

From the Cardiovascular Department, Michael Reese Hospital. Read by title at the Central Society for Clinical Research, Chicago, during November 1938.

The cost of the heparin was defrayed by a grant from an anonymous benefactor. Dr. Best, Dr. Murray and their associates informed us concerning the utilization of heparin. Mr. Hutchison, of the Connaught Laboratories, cooperated in facilitating the shipments of heparin.

1. Friedman, Meyer; Katz, L. N., and Howell, Katharine M.: Experimental Endocarditis Due to *Streptococcus Viridans*, *Arch. Int. Med.* 61: 95 (Jan.) 1938. Friedman, Meyer: A Study of the Fibrin Factor in Its Relation to Subacute Endocarditis, 63:173 (June) 1938.

2. Murray, D. W. G.; Jaques, L. B.; Perrett, T. S., and Best, C. H.: Surgery 2:163 (Aug.) 1937.

ment had been continued sufficiently long to evaluate the worth of the procedure:

REPORT OF CASE

History.—A. H. was admitted to the Michael Reese Hospital March 5, 1938, complaining of weakness, fever, loss of weight and loss of appetite of several months' duration. His illness began insidiously in October 1937 with a vague feeling of malaise, and as it progressed there developed a continuous fever, loss of weight and strength, and embolic accidents. Before coming to the hospital, he had been unsuccessfully treated with quinine, sulfanilamide, antistreptococcus serum and blood transfusions. The essential pathologic changes on admission were (1) evidence of weight loss, (2) anemia, (3) clubbing of the fingers, (4) a Corrigan pulse with a capillary pulse, (5) an enlarged heart with a diastolic murmur at the base and a short systolic murmur at the apex and (6) a temperature and pulse rate elevation.

Laboratory examination revealed hemoglobin 65 per cent, red blood cell count 3,150,000, white blood cell count 12,500, sedimentation time 44 mm. in an hour, Weltman reaction 5, blood sugar 88, nonprotein nitrogen 35, occasional red blood cells in the urine, normal stool, *Streptococcus viridans* in three successive blood cultures, and evidence of myocardial damage shown in an electrocardiogram.

Following a blood transfusion, the new concentrated heparin was added to physiologic solution of sodium chloride and 5 per cent dextrose solution so that each liter contained 30,000 units of heparin. A needle was fixed in the vein and, by means of a rectal drip, the solution was given continuously for ten days. The coagulation time of the blood was maintained after the second day of treatment at twenty-five to thirty minutes (five times normal for this patient).

The intravenous heparin treatment was begun on March 8 and was discontinued on the morning of March 18 because the patient at this time began to show projectile vomiting. At the same time his blood pressure began to rise and his temperature to fall, suggesting a cerebral hemorrhage. He gradually lost consciousness and in the afternoon he died. In the ten days during which he received treatment he experienced

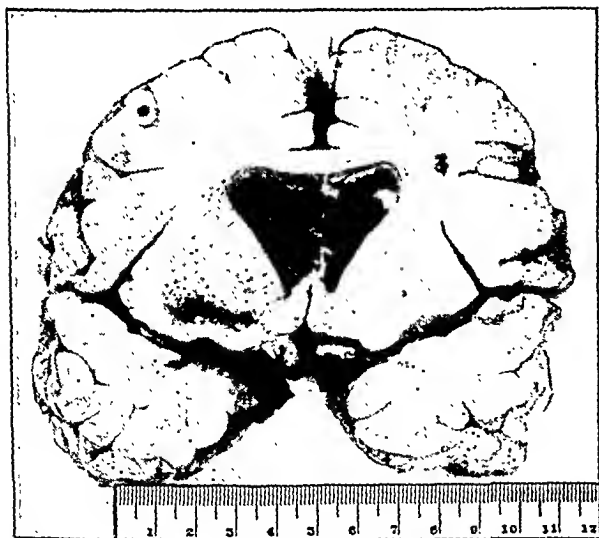


Fig. 1.—Section of brain showing encephalomalacia and hemorrhage into ventricles.

no symptoms other than a transitory diarrhea until the final episode. No petechiae were observed during the hospital stay. No hemorrhage was noted following the withdrawal of the intravenous needles, if pressure was applied for a few seconds.

Autopsy (by Dr. Otto Saphir).—There was no evidence of internal hemorrhage in any organ other than the brain. In this organ the lateral ventricles and the third and fourth ventricles were seen to be filled with blood and there was some blood in the subarachnoid space. The source of this

hemorrhage was found to be an area of encephalomalacia (fig. 1) in the frontal lobe that had probably resulted from a previous infected embolus from seven to ten days before. The heart, particularly the left ventricle, was enlarged. The tricuspid and pulmonic valves were normal but the mitral and aortic valves showed an old healed endocarditis, and the aortic valve leaflets were seen to be the site of a vegetative process that had partially ulcerated the leaflets (fig. 2). The size of the vegetations on the leaflets were not large and were "clean"

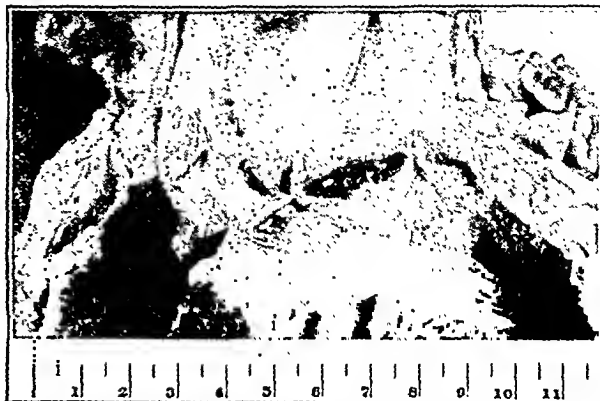


Fig. 2.—Appearance of aortic valve showing ulcerative vegetations.

in appearance. There were two necrotic areas on the vegetations, possibly indicating dissolution of some of the fibrin. Immediately beneath the aortic valves on the wall of the left ventricle there was a minute vegetation, arising apparently by contact. There were several infarcts in the spleen in various stages of healing. The kidneys appeared normal grossly.

Microscopic sections of the brain lesion confirmed the opinion made from the gross examination. The aortic leaflet vegetations were observed to be fairly well organized, bacteria being present in the outer fringe of the thrombus, which had not yet become organized. No polymorphonuclear leukocytes in the valvular area immediately adjacent to the vegetation were observed. Small focal accumulations of round and polymorphonuclear cells were found in the myocardium. The kidneys showed an acute, disseminated glomerular nephritis.

COMMENT

We are placing this note on record in order to stimulate further clinical investigation of this method of therapy in subacute bacterial endocarditis. We are aware that there are theoretical dangers to its use, since in a disease prone to hemorrhage, as subacute bacterial endocarditis occasionally is, the use of heparin by interfering with the physiologic process of clotting may lead to intractable or even fatal hemorrhage following the rupture of a blood vessel after embolization, as might have occurred in this case. The sudden liberation of large quantities of bacteria should the vegetation disintegrate may cause an overwhelming bacteremia. The acute glomerular nephritis found in this case might have been caused conceivably by the heparin. Further, it has not been shown conclusively that heparin actually prevents the deposition of platelets and fibrin in man, although the evidence is highly suggestive. It is possible too that the promptness of instituting treatment becomes an important and vital factor. However, these contraindications to the use of heparin are not sufficient to discourage its use, since the disease itself is almost inevitably fatal and the possibility exists that some definite good may result. We therefore feel that the further trial of heparin in subacute bacterial endocarditis is warranted. Further studies are being projected in this department both on the experimental animal and on human beings.

THE BACTERIOSTATIC AND ANTITOXIC
ACTIONS OF SULFANILAMIDE

TISSUE CULTURE STUDIES

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The bacteriostatic theory explains the curative effects of sulfanilamide in infections in small laboratory animals as due primarily to the bacteriostatic action of the drug. As a consequence of the reduced number of organisms, there is secondary reduction in the elaboration of toxic substances (leukocidin, hemolysin and the like). The theory states that under these conditions the natural defense mechanism of the body frees the tissues of the infecting organisms.

Bliss and Long,¹ basing their conclusion chiefly on the results of experiments with mouse peritonitis caused by the Welch bacillus, reported that the only demonstrable effect of sulfanilamide on this organism was bacteriostasis. Gay and Clark,² working with rabbit empyema caused by a hemolytic streptococcus of human origin, concluded that the primary effect of the drug was bacteriostasis.

Colebrook, Buttle and O'Meara³ had earlier noted that the blood and serum of human beings and laboratory animals possessed increased bacteriostatic and bactericidal power after the administration of sulfanilamide and the prontosils. They regarded it as probable that this factor might be important in human infections but expressed surprise that the very low bactericidal power of the blood of mice should be associated with such marked curative effect.

Osgood⁴ reported early in 1938 that the major effect of sulfanilamide appeared to be toxin neutralization. However, his conclusion was promptly criticized. In an exchange of papers, Hemmens and Dack⁵ attacked the conclusion that sulfanilamide acted by toxin neutralization; while Osgood and Brownlee⁶ admitted that they were not able to demonstrate toxin neutralization with ordinary methods, they expressed the belief that conditions in tissue cultures are more comparable to conditions in the body than is true of the other in vitro tests.

The basis for criticism by Hemmens and Dack was the fact that bacteriostasis, as a factor in reducing toxin

formation, had not been properly evaluated. Osgood failed to record the size of the colonies showing smaller hemolytic zones in plates containing sulfanilamide. His data on cell suspensions could not be used to support his conclusion, since these were not in any sense quantitative.

Gross, Cooper and Lewis⁷ reported that, in the presence of serum, sulfanilamide failed to neutralize streptococcus hemolysin. Huntington⁸ reported that he was unable to neutralize hemolysin, fibrinolysin or scarlatinal toxin with sulfanilamide. Long, Bliss and Feinstone⁹ found that sulfanilamide failed to protect guinea pigs and mice inoculated with lethal doses of botulinus toxin. They noted also that high concentrations of the drug in the blood of human beings did not alter positive reactions to the Dick test. Kemp¹⁰ tested the neutralizing power of sulfanilamide for hemolysin, fibrinolysin and dermatotoxin with negative results. In discussing his observations, Kemp states: "But there is something in these observations of more importance than this disagreement [with Osgood], and that is: whatever the action of sulfanilamide, the in vitro methods fail to reveal it . . ." He was probably led to this conclusion as a result of his failure to demonstrate an antihemolytic effect of sulfanilamide on blood agar plates. It is not clear why the excellent work of English and American investigators showing beyond reasonable doubt that the drug possesses powerful antibacterial properties in vitro was not considered by Kemp. His methods are not described in sufficient detail to enable one to decide why he failed to observe an antihemolytic effect secondary to bacteriostasis. It is not stated whether he observed a bacteriostatic effect.

It is now realized that several factors may prevent any considerable bacteriostatic effect of the drug. For instance, the size of the inoculum is important, as shown by Colebrook, Buttle and O'Meara,³ who found that in the presence of very large numbers of organisms the drug was practically without effect. As Garrod¹¹ and Hoare¹² point out, this factor may account for Domagk's conclusion that there is little correlation between the in vivo and the in vitro effect of sulfanilamide.

Another factor that may have influenced Kemp's results is the type of strains used. Hoare¹² found nineteen of twenty-one strains of human origin responsive to sulfanilamide in vitro. The other two strains were from cases which did not respond to the drug. Also Bliss and Long¹³ and Bliss, Long and Feinstone¹⁴ felt that there was a significant correlation between in vivo and in vitro response. Since half of Kemp's

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Assistance in the preparation of these materials was furnished by the personnel of the Works Progress Administration, official project No. 665-71-3-69, subproject No. 237, and the National Youth Administration.

1. Bliss, Eleanor A., and Long, P. H.: Observations on the Mode of Action of Sulfanilamide, *J. A. M. A.* **109**: 1524-1527 (Nov. 6) 1937.

2. Gay, F. P., and Clark, Ada R.: On the Mode of Action of Sulfanilamide in Experimental Streptococcus Empyema, *J. Exper. Med.* **66**: 535-547 (Nov.) 1937.

3. Colebrook, Leonard; Buttle, G. A. H., and O'Meara, R. A. Q.: The Mode of Action of *p*-Aminobenzenesulfonamide and Prontosil in Hemolytic Streptococcal Infections, *Lancet* **2**: 1323-1326 (Dec. 5) 1936.

4. Osgood, E. E., and Brownlee, Inez E.: Culture of Human Marrow: Studies on the Mode of Action of Sulfanilamide, *J. A. M. A.* **110**: 349-356 (Jan. 29) 1938.

5. Hemmens, Elizabeth S., and Dack, G. M.: Mode of Action of Sulfanilamide, *J. A. M. A.* **110**: 1209-1210 (April 9) 1938.

6. Osgood, E. E., and Brownlee, Inez E.: The Mode of Action of Sulfanilamide, *J. A. M. A.* **110**: 1770 (May 21) 1938.

7. Gross, Paul; Cooper, F. B., and Lewis, Marion: Inhibition of Streptococcal Hemolysin by Sulfonamide Compounds, *Proc. Soc. Exper. Biol. & Med.* **38**: 275-279 (March) 1938.

8. Huntington, R. W., Jr.: Failure of Sulfanilamide to Prevent Hemolysis, Fibrinolysis and Production of Erythrogenic Toxin by Hemolytic Streptococci in Vitro, *Proc. Soc. Exper. Biol. & Med.* **38**: 328-331 (April) 1938.

9. Long, P. H.; Bliss, Eleanor A., and Feinstone, W. H.: Mode of Action, Clinical Use and Toxic Manifestations of Sulfanilamide, *J. A. M. A.* **112**: 115-121 (Jan. 14) 1939.

10. Kemp, H. A.: On the Action of Sulfanilamide: Failure to Demonstrate Antihemolytic, Antifibrinolytic and Antitoxic Effect of the Drug, *Texas State J. Med.* **34**: 208-211 (July) 1938.

11. Garrod, L. P.: The Chemotherapy of Bacterial Infections, *Lancet* **1**: 1125-1129 (May 14), 1178-1182 (May 21) 1938.

12. Hoare, E. D.: Bactericidal Changes Induced in Human Blood and Serum by Sulfamidochrysoidine and Sulfanilamide, *Lancet* **1**: 655-659 (March 19) 1938.

13. Bliss, Eleanor A., and Long, P. H.: The Failure of Para-Aminobenzenesulfonamide Therapy in Urinary Tract Infections Due to Group D (Lancefield) Beta Hemolytic Streptococci, *New England J. Med.* **217**: 18-21 (July 1) 1937.

14. Bliss, Eleanor A.; Long, P. H., and Feinstone, W. H.: The Differentiation of Streptococci and Its Relation to Sulfanilamide Therapy, *South. M. J.* **31**: 303-308 (March) 1938.

strains were from cases which showed good clinical response, it seems unlikely that this factor explains his results.

A further factor of importance has been emphasized by Lockwood,¹⁵ who finds that peptones interfere with the antibacterial power of sulfanilamide in vitro. Thus the composition of the culture medium must be taken into account.

Kemp's methods of measurement are not described. Hence, it is not clear whether these are sufficiently refined to detect slight differences in the size of the colony and the hemolytic zone in experimental and control sets.

As will be shown later, it is possible, when using a suitable medium and suitable quantitative methods, to demonstrate the bacteriostatic property of sulfanilamide in dilutions as high as 1:1,000,000 even when the medium contains as many as 150,000 colonies per cubic centimeter. With fewer colonies bacteriostasis is more pronounced.

Osgood¹⁶ seems reluctant to grant any importance to the bacteriostatic effect of sulfanilamide as a mechanism whereby toxin formation is reduced. This is especially difficult to understand in view of his own clear demonstration of the antibacterial power of sulfanilamide in vitro. This property of the drug is well shown in his table 2.⁴ Moreover, he noted and measured the smaller areas of hemolysis around colonies of beta streptococci grown in the presence of three different concentrations of the drug. He recorded regular and significant decreases in the diameter of the hemolytic zones. These observations he interpreted as evidence of toxin neutralization without recording the diameter of the colonies. It is obviously impossible to arrive at any conclusion as to the cause of the observed reduction in hemolysis without considering the bacteriostatic effect of the drug.

The question of decreased toxin production secondary to the decrease in the number of organisms is one of fundamental importance. This is the question raised in the criticism of Hemmens and Dack.⁵ In their reply, Osgood and Brownlee⁶ state: "The word 'neutralization' was poorly chosen and . . . we should have said 'The major action of sulfanilamide appears to be on the production of toxins or aggressins. We do not know to what this is due.'" In a later paper Osgood¹⁷ states that "sulfanilamide's major action is prevention of formation of, or neutralization of, toxins." Here it is not clear what he means by "prevention of formation." He seems to imply inhibition of toxin formation out of proportion to inhibition of bacterial growth. In the same issue, in discussing Kemp's paper,¹⁰ Osgood states: "The major action of sulfanilamide appears to be on the toxins or aggressins. We do not as yet know whether this is due to destruction of some substance necessary for the formation of these toxins or aggressins, to a direct action on the organism preventing the formation of toxins or aggressins, to the destruction of the nascent toxins or aggressins, to destruction of toxins or aggressins after they are formed, to catalysis of an antitoxin-toxin reaction or to a sufficiently slow rate of production of toxins or aggressins so that they are destroyed by the natural processes of oxidation as rapidly as they are formed."

In an effort to resolve this detailed and somewhat speculative list of possibilities into a smaller number of general propositions which can be tested experimentally, we list three obvious possibilities involved in the relation between bacteriostasis and inhibition of hemolysis (hemolysin being the only toxin considered in this paper). Decreased hemolysis in the presence of sulfanilamide might be (a) secondary to bacteriostasis caused by the drug, as demanded by the bacteriostatic theory (b) caused by neutralization of toxin, i. e., inactivation or destruction of toxin, or (c) due to "prevention of formation" of toxin, i. e., a reduction of toxin in excess of what might reasonably be regarded as secondary to the smaller number of organisms resulting from the bacteriostatic effect of the drug.

By the use of ordinary methods, it has now been established beyond reasonable doubt that sulfanilamide does not neutralize toxin. The latest paper on this phase of the problem is by Osgood and Powell.¹⁸ They confirm the results of other investigators on this point. They do not, however, discuss the bearing of their observations on Osgood's previously published opinions on toxin neutralization, or the bearing of either on the bacteriostatic theory which demands reduced toxin formation as a consequence of bacteriostasis. In discussing this paper, it was stated in *THE JOURNAL*.¹⁹



Fig. 1.—Control (a) and experimental cultures (b). Sulfanilamide 1:1,000; ninety-six hours; approximately 125 colonies per cubic centimeter; strain 2; no erythrocytes in clot. Direct photograph, $\times 1\frac{1}{4}$.

that "The results of these experiments, therefore, fail to support, although they do not disprove, the earlier experiments with cultures of human bone marrow reported by the senior author."

Evidence is offered later to show that, in tissue culture mediums composed chiefly of rabbit plasma and serum, sulfanilamide exerts a bacteriostatic effect on the three strains of beta hemolytic streptococci studied; that the effect varies directly with the concentration of the drug and inversely with the number of bacteria present; that a decrease in hemolysis is observed when bacteriostasis is observed; that the extent of the decrease of hemolysis does not suggest either toxin neutralization or "prevention of formation" of toxin beyond what might reasonably be expected as a result of the observed bacteriostasis, and that the drug inhibits the development of diffuse peripheries around colonies of beta streptococci.

MATERIALS AND METHODS

The routine tissue culture methods used have been described previously by King.²⁰ The method as applied

15. Lockwood, J. S.: Studies on Mechanism of Action of Sulfanilamide; Effect of Sulfanilamide in Serum and Blood on Hemolytic Streptococci in Vitro, *J. Immunol.* 35: 155-193 (Sept.) 1938.

16. Osgood and Brownlee (footnotes 4 and 6).

17. Osgood, E. E.: Culture of Human Marrow, *Texas State J. Med.* 24: 206-208 (July) 1938.

18. Osgood, E. E., and Powell, H. M.: Failure of Sulfanilamide to Inactivate Preformed Hemotoxins, Diphtheric Toxin or Tetanic Toxin, *Proc. Soc. Exper. Biol. & Med.* 32: 37-40 (Oct.) 1938.

19. Sulfanilamide and Bacteriostasis, current comment, *J. A. M. A.* 111: 2306 (Dec. 17) 1938.

20. King, J. T.: Tissue Culture Technique, *Arch. f. exper. Zellforsch.* 9: 341-349 (No. 3) 1930; An "Activated" Extract for Coagulating Heparin-Plasma, *ibid.* 10: 467-473 (No. 4) 1931.

to the study of neoprontosil has been described by King, Henschel and Green.²¹

The Maximow technic is used, the culture being planted on a 22 mm. round cover slip. This slip is fastened to a large cover (with saline solution), which is then inverted over a deep hollow ground slide and sealed with petrolatum and afterward with a petrolatum-paraffin mixture. Cultures are incubated as lying-drop preparations at 37.5 C. in a special down-draft incubator previously described by King.²² Under these conditions there is no vapor in the dome of the chamber even in the early hours of incubation. The culture is composed of one drop of heparinized rabbit plasma and two drops of tissue extract made by extracting six day

TABLE 1.—Effect of Varying the Number of Organisms on the Bacteriostatic Effect of Sulfanilamide 1: 1,000; Twenty-Four Hours; Strain 2

Dilution of Bacterial Culture	Average Colony Diameter, Control	Average Colony Diameter, Experiment	Inhibition, per Cent
1:100,000.....	7.09	5.12	27.8
1:1,000,000.....	24.29	11.40	53.1
1:10,000,000.....	49.01	12.40	74.7

chick embryos with rabbit serum. The properties of this extract have been previously described by King and Henschel.²³

When hemolysin is to be studied, sufficient rabbit erythrocytes are introduced to make a 5 per cent suspension in the final clot. Sulfanilamide is dissolved in 0.9 per cent saline solution and sterilized by filtration. A sufficient amount of this solution is added to the tissue extract to give the required concentration in the final medium. A corresponding amount of saline solution is added to the control medium.

Organisms are added to the tissue extract after suitable dilution of the original culture in Tyrode's solution to give the required concentration in the final medium.

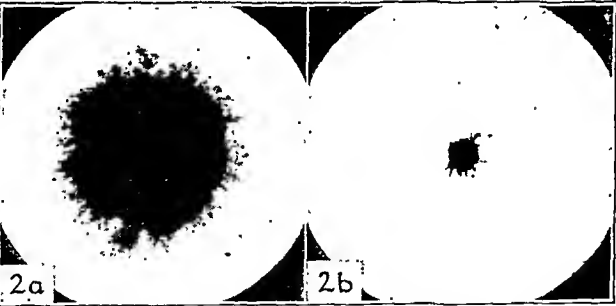


Fig. 2.—Control (a) and experimental (b) colonies. Sulfanilamide 1: 1,000, ninety-six hours; from 5 to 10 colonies per cubic centimeter; strain 2; no erythrocytes in clot. Slightly reduced from a photomicrograph with a magnification of 37 diameters.

The streptococci are grown in veal infusion broth. Cultures are approximately 18 hours old when used.

The three strains of beta streptococci used are all of human origin. These strains are mouse virulent. The strain BG was isolated from the cerebrospinal fluid of a patient with meningitis. The clinical response

21. King, J. T.; Henschel, A. F., and Green, Beryl S.: Influence of Prontosil Soluble on Beta Hemolytic Streptococci Growing in Tissue Culture Media, *Proc. Soc. Exper. Biol. & Med.* **38**: 810-812 (June) 1938.
22. King, J. T.: Special Incubator for Tissue Cultures, *Arch. f. exper. Zellforsch.* **20**: 208-212 (No. 2) 1937.
23. King, J. T., and Henschel, A. F.: Comparison of Serum and Saline Extracts as Nutritive Media for Mammalian Lymph Node Cultures, *Proc. Soc. Exper. Biol. & Med.* **32**: 1224-1226 (May) 1935.

to sulfanilamide was prompt. Strain 2 was isolated from the blood in a fatal case of septicemia. Strain 40, Lancefield group C, was isolated from a culture taken on material from the throat.

Colony diameter is used as an index of the bacteriostatic effect of the drug. The diameter of the hemolytic zone is used as an index of the hemolytic activity of the colony. The term "hemolytic index" is used to

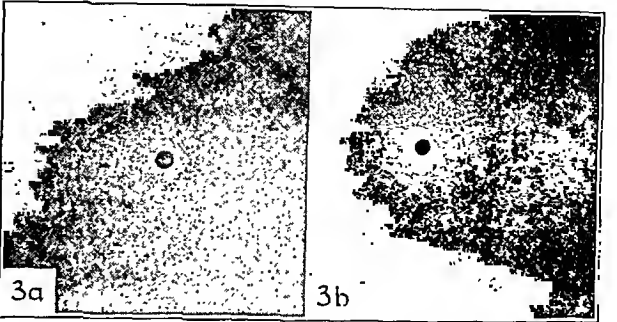


Fig. 3.—Control (a) and experimental (b) colonies. Sulfanilamide 1: 1,000; twelve hours; strain 2; 5 per cent erythrocytes in clot. Slightly reduced from a photomicrograph with a magnification of 37 diameters.

describe the amount of hemolysis in relation to the size of the colony; i. e., the diameter of the zone of hemolysis divided by the diameter of the colony.

Measurements are made at a magnification of 60 diameters, with a standardized ocular micrometer (114 units = 1 mm.). With a mechanical stage, accurate measurements can be made of the diameter of the colony and zone of hemolysis.

Photomicrographs are made on process film. Exposure is kept down to the minimum required to register the lysed area adjacent to the colony. In this manner maximal contrast is obtained between lysed and unlysed portions of the clot. Films are developed for strong contrast. Direct photographs of cultures containing no erythrocytes are taken against a black background on process film. Panchromatic process film is used for cultures containing erythrocytes.

RESULTS

Streptococci grow rapidly in this medium, colonies usually becoming visible between the fourth and the sixth hour when the medium contains no erythrocytes. Although some strains are fibrinolytic, those used in

TABLE 2.—Bacteriostatic Effect of Sulfanilamide 1: 1,000; at Twenty-Four Hours; Strain BG; 150,000 Colonies per Cubic Centimeter

Sulfanilamide Concentration	Colony Diameter	Inhibition, per Cent
Controls.....	5.67	....
1:1,000.....	4.52	20.3
1:10,000.....	4.67	17.6
1:100,000.....	4.81	15.2
1:1,000,000.....	4.92	13.2

this study showed no lysis of the clot. The usual inverse relationship between the number of colonies and the size of the colonies is observed.

The time at which colonies attain maximal size depends on the number of colonies present. When the medium contains 150,000 colonies or more per cubic centimeter, growth is essentially complete in twelve hours. When the colony count per cubic centimeter is 10 or less, growth continues for at least five days.

The inhibition caused by a given concentration of sulfanilamide varies inversely with the number of colonies present. Table 1 shows the result of three dilutions of a culture of strain 2 in the medium without erythrocytes.

Figure 1 shows the effect of sulfanilamide with approximately 125 colonies per cubic centimeter and figure 2 with from 5 to 10 colonies per cubic centimeter.

With a constant number of bacterial colonies the inhibitory influence of the drug varies directly with the concentration. Table 2 shows the bacteriostatic effect on strain BG when a heavy inoculum is used.

TABLE 3.—Effect of Sulfanilamide 1:1,000 on Colony Size and Hemolysis; Strain 2

Time	Controls			Sulfanilamide			Colony Inhibition, per Cent	Inhibition of Hemolysis, per Cent
	Diameter of Colony	Diameter of Hemolytic Zone	Hemolytic Index	Diameter of Colony	Diameter of Hemolytic Zone	Hemolytic Index		
18 hrs.	39.8	65.0	1.63	12.4	32.4	2.62	68.8	50.1
24 hrs.	78.5	132.9	1.69	13.7	57.4	4.17	82.4	56.8
48 hrs.	214.7	354.0	1.64	33.7	208.1	6.20	84.3	41.2
3 days	252.4	399.5	1.58	43.2	245.7	5.69	82.9	38.5

The data in table 2 are based on measurement of between 225 and 300 colonies (in three cultures) in each concentration of sulfanilamide and control set (three cultures). With this number of colonies, strain BG shows little, if any, qualitative difference between experimental and control colonies.

In strong contrast to the very moderate inhibition shown in table 2 in the presence of a large number of colonies, this strain regularly shows more than 80 per cent inhibition with 25 colonies or less per cubic centimeter (sulfanilamide 1:1,000).

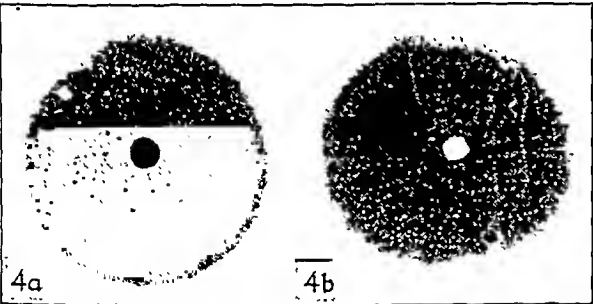


Fig. 4.—Control (a) and experimental (b) colonies. Sulfanilamide 1:1,000; forty hours; strain 2; 5 per cent erythrocytes in clot. Slightly reduced from a photomicrograph with a magnification of 37 diameters.

TOXIN NEUTRALIZATION

When 5 per cent rabbit erythrocytes are added to the medium before clotting takes place, it is possible to determine the size of the colony at the time at which hemolysis becomes evident. Subsequent measurements of the diameter of the colony and of the zone of hemolysis make possible a correlation between these two factors.

Early observations and measurements show that, when a colony attains a given size, hemolysis commences whether sulfanilamide is present or not. Hemolysis starts when the colony attains a size of approximately 10 units.

Figure 3 shows a twelve hour control and experimental colonies of approximately the same size. There is no evidence that a high concentration (100 mg. per hundred cubic centimeters) of sulfanilamide has reduced the hemolytic activity of the colony. As is evident from tables 3 and 4, there is a lag in the development of experimental colonies due to the bacteriostatic effect of the drug. This results in less hemolysis in

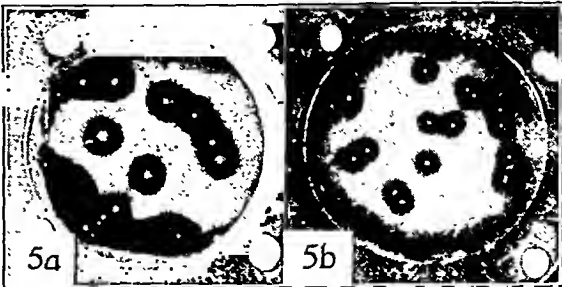


Fig. 5.—Control (a) and experimental (b) cultures. Sulfanilamide 1:1,000; twenty-four hours; strain 2; 5 per cent erythrocytes in clot. Direct photograph, $\times 1\frac{1}{2}$.

experimental cultures at a given time. However, when experimental colonies are compared with control colonies of the same size, there is no evidence of hemolysin neutralization.

Study of the subsequent development of the cultures likewise fails to reveal any evidence of neutralization of preformed hemolysin. Figure 4 shows well developed colonies from experimental and control sets (forty hours).

Figure 5 is made from direct photographs of experimental and control cultures of strain 2 (sulfanilamide 1:1,000). In this figure the lysed areas are dark while the unlysed portion of the clot is light.

Detailed observations on two experiments with strain 2 are shown in tables 3 and 4. In the experiment shown in table 3 the control colonies showed the usual diffuse peripheries. In the other experiment (table 4) the control colonies grew as compact masses.

In both experiments typical inhibition of both colony and hemolytic zone is shown.

TABLE 4.—Effect of Sulfanilamide 1:1,000 on Colony Size and Hemolysis; Strain 2

Time	Controls			Sulfanilamide			Colony Inhibition, per Cent	Inhibition of Hemolysis, per Cent
	Diameter of Colony	Diameter of Hemolytic Zone	Hemolytic Index	Diameter of Colony	Diameter of Hemolytic Zone	Hemolytic Index		
9 hrs.	10	..	....	5	..	....	50.0	....
11 hrs.	13	25	1.92	6	..	....	53.9	....
14 hrs.	38	91	2.39	11	32	2.91	71.1	64.8
22 hrs.	57	232	4.07	21	82	3.90	63.2	61.7
24 hrs.	59	264	4.47	27	110	4.07	54.2	58.3
35 hrs.	67	316	4.72	41	215	5.24	38.8	32.0
44 hrs.	76	327	4.30	49	266	5.43	35.5	18.7
2½ days	81	352	4.35	60	300	5.00	25.9	14.8

In all cases it has been noted that the hemolytic index rises to a maximum and then declines somewhat. The experimental cultures reach the maximum later than the controls.

The hemolytic index is higher in the cultures containing sulfanilamide than in the controls. As will be noted later, the significance of this fact is not entirely clear at present.

BACTERICIDAL PROPERTIES OF SULFANILAMIDE

In this medium there has been no consistent reduction in the number of colonies in experimental cultures.

QUALITATIVE CHANGES CAUSED BY SULFANILAMIDE

With large inoculums no characteristic change is noted. Sometimes experimental colonies appear less dense. When the inoculum is sufficiently small to permit colonies to attain any considerable size, the drug causes qualitative change in those strains which show diffuse peripheries. The drug regularly inhibits the development of such peripheries. The resulting colonies are small and compact. The strains studied have not shown a characteristic qualitative response to the drug when they failed to develop diffuse peripheries.

It has been noted that colonies whose diffuse peripheries have been inhibited by sulfanilamide frequently show heavy chains invading the clot. The amount of chain formation is quite variable. In our experience, from three to twelve chains can be regarded as typical. When chains are present they are not evenly distributed around the colony but are grouped in a loose net in a rather limited area.

Rarely a colony may develop a complete periphery composed of this typical loose network of heavy chains. We have seen only a few such colonies and those developed rather late.

We wish especially to emphasize the difference between this type of periphery and the normal, diffuse periphery seen around control colonies. In the latter the organisms are widely scattered, singly and in groups of two or three. In the presence of sulfanilamide, however, the normal mechanism of division is so modified as to produce long chains.

Gay and Clark² had observed earlier that when streptococci were grown in serum containing sulfanilamide the organisms grew in long chains of pleomorphic and metachromatic forms. Later, Meyer²⁴ described "great masses of markedly deformed, swollen streptococci, growing in endless chains," in relation to the "clumping reaction," which he observed in serum broth cultures of streptococci containing a sulfanilamide-sugar compound.

Lockwood¹⁵ described long chains of abnormal streptococci growing in mediums containing sulfanilamide. This tendency to form long chains in the presence of the drug was also noted by Chandler and Janeway.²⁵

COMMENT

Of the many factors having a probable bearing on the mechanism of action of sulfanilamide, we are concerned in this paper with the following: (1) the bacteriostatic action in vitro as influenced by the concentration of the drug and the size of the inoculum; (2) the correlation between the bacteriostatic effect and the amount of hemolysis; (3) the qualitative changes caused by the drug.

It is now realized that certain experimental conditions are required to demonstrate the effects of sulfanilamide in vitro, and all failures to demonstrate such effects when therapeutically responsive strains of beta streptococci are used must be examined in the light of this knowledge.

Colebrook, Buttle and O'Meara³ reported that the drug was almost without effect in the presence of very large numbers of organisms. Lockwood¹⁵ also found a

greater effect when using a smaller inoculum. Recently, Chandler and Janeway²⁵ reported the same experience. These investigators worked with fluid mediums.

In tissue culture clots we have found the bacteriostatic effect of the drug to vary inversely with the number of colonies present (table 1). That it is possible, however, to demonstrate moderate bacteriostasis in this medium, even in the presence of relatively large numbers of organisms, is shown in table 2.

Lockwood¹⁵ found that peptones interfere with the action of sulfanilamide and pointed out the importance of avoiding the use of mediums containing such substances if one wished to obtain the full effect of the drug.

Lockwood, Coburn and Stokinger²⁶ reported, on the basis of clinical experience, that "the presence of debris, human or bacterial, diminished the effectiveness of sulfanilamide on the hemolytic streptococcus. In each instance the organisms remaining in broken down tissue maintained their virulence. It is not known whether the debris itself had a protective action on the organisms or whether there was insufficient penetration of the drug into the locus."

We²⁷ have found that the presence of a small fragment of tissue in a tissue culture greatly antagonizes the effects of sulfanilamide even at a considerable distance from the fragment. We have observed this effect with concentrations of sulfanilamide as high as 140 mg. per hundred cubic centimeters. We believe that the products of tissue disintegration exercise a protective effect on the organisms.

Since the extracts used in making the clots of tissue culture were made by shaking six day chick embryos in serum, the question might be raised whether enough peptone-like substance would be extracted to cause a "peptone effect"; i. e., a reduction in the effect of sulfanilamide.

It was pointed out by Colebrook, Buttle and O'Meara³ that the effect of sulfanilamide was much less marked in the blood of the small laboratory animals than in human blood. Except for very small inoculums, they found the drug to be bacteriostatic but not bactericidal in the blood of these animals. Gay and Clark² observed only bacteriostasis in rabbit serum containing the drug. In neither of these cases was there any addition of peptone-like substance. In view of these facts and of the further fact, already noted, that the drug is much more effective in the cell-free medium than in the medium containing a small tissue fragment, we assume tentatively that the medium reacts as though free of any significant amount of peptone-like material.

As pointed out earlier, Bliss and Long¹³ and Bliss, Long and Feinstone¹¹ obtained satisfactory correlation between in vivo and in vitro response, and Hoare¹² found 100 per cent correlation in a study of twenty-one strains.

In the present study we have used only Lancefield group A and C strains. The strains reported, and others less intensively studied, proved responsive to the drug in the tissue culture medium.

It now seems safe to assume that all therapeutically responsive strains of beta hemolytic streptococci are inhibited by sulfanilamide in vitro if the experimental conditions are suitable.

24. Meyer, Fritz: New Studies in Sulfanilamide Therapy, Quart. Bull. Sea View Hosp. 2: 380-404 (July) 1938.

25. Chandler, C. A., and Janeway, C. A.: Observation on the Mode of Action of Sulfanilamide in Vitro, Proc. Soc. Exper. Biol. & Med. 40: 179-184 (Feb.) 1939.

26. Lockwood, J. S.; Coburn, A. F., and Stokinger, H. E.: Studies on the Mechanism of Action of Sulfanilamide, J. A. M. A. 111: 2259-2264 (Dec. 17) 1938.

27. King, J. T., and Henschel, A. F., to be published.

In view of the well known ability of the streptococcus to produce destructive toxins, it is natural that considerable interest has attached to the possibility that sulfanilamide might either reduce the amount of toxin formed or neutralize toxin. The bacteriostatic theory assumes that there is a reduction in the amount of toxin formed secondary to the reduction in the number of organisms brought about by the drug. In the tissue culture medium we have always found that when the drug causes a decrease in the size of the colony it also causes a decrease in the size of the hemolytic zone. Typical results are shown in tables 3 and 4.

We have observed that hemolysis starts when the colony reaches a certain size whether or not sulfanilamide is present. There is a lag in the development of experimental colonies as compared with the controls. Otherwise the sequence of events is fundamentally alike in the two. Study of the subsequent development of the colony shows that the drug continues to exert a bacteriostatic effect and that the amount of hemolysis is less in experimental cultures. On the basis of colony size, however, colonies growing in 100 mg. per hundred cubic centimeters of the drug produce a larger rather than a smaller zone of hemolysis; i. e., they show a higher hemolytic index. Possible explanations for the higher hemolytic index observed in experimental cultures will be considered after the qualitative changes caused by the drug have been discussed.

It is clear that if the drug neutralized hemolysin or reduced the formation of hemolysin out of proportion to the reduction in the number of organisms, the hemolytic index of experimental colonies would be lower. This is not the case, however. Consequently, we can only conclude that such reduction in hemolysis as is observed is secondary to the bacteriostatic effect of the drug.

Most of the strains available to us grow with diffuse peripheries in this medium, provided the inoculum is not too large. Some strains, for example strain 2, are not constant in this regard, at times showing peripheries and at other times growing as compact colonies.

We have never seen a normal diffuse periphery in a culture containing sulfanilamide unless the effects of the drug were antagonized by the presence of tissue.²⁷ The drug inhibits the rapid invasion of the clot usually seen around control colonies.

As already noted, an inhibited colony may show a variable number of long, heavy chains projecting from some point on the periphery or, rarely, a complete periphery composed of a loose network of such chains.

In considering possible explanations for the higher hemolytic index observed for colonies growing in cultures containing sulfanilamide, the qualitative change in colony form usually caused by the drug must be taken into account. It has been pointed out that the drug inhibits the development of the wide, diffuse periphery usually seen around colonies of beta streptococci in this medium. As may be seen by comparing the control colonies shown in tables 3 and 4, this diffuse periphery is not as active in producing hemolysis as the more dense central part of the colony. In the experiment detailed in table 3, strain 2 grew with the usual peripheries. The hemolytic index reached a maximum of 1.69. An experiment with the same strain is shown in table 4, in which the colonies are of the compact type showing a maximum hemolytic index of 4.72. From these facts it is evident that a more compact colony has a higher hemolytic index.

It is possible that the higher hemolytic index observed in cultures containing sulfanilamide is due to the formation of a more compact colony. It is clear that this factor is important when the controls grow with the usual diffuse peripheries, as in the experiment shown in table 3. The interpretation is complicated however by the fact that, even when the control colonies fail to develop diffuse peripheries, sulfanilamide causes a higher hemolytic index. In this case it is not evident that the drug causes the development of more compact colonies, but the possibility cannot be ruled out.

We have considered the possibility that erythrocytes might be more vulnerable to lysis by streptococcus hemolysin in the presence of sulfanilamide. There is, however, no experimental evidence to support this theoretical possibility.

Another possible explanation is based on the fact that sulfanilamide is known to form numerous conjugation products. Czarnetsky and his associates²⁸ have found that certain derivatives of the streptococcus will conjugate with the drug to form hemolytic products. It is therefore possible that the drug combines with some product of bacterial metabolism to form a hemolytic agent. Should this ultimately prove to be true, it is interesting to speculate what bearing it might have on the cause of the severe anemias now known to occur occasionally during administration of the drug.

SUMMARY

A tissue culture study has been made of the bacteriostatic and antihemolytic properties of sulfanilamide.

All strains of beta streptococci studied were inhibited.

The bacteriostatic effect varied directly with the concentration of the drug and inversely with the number of bacterial colonies.

Reduction in hemolysis was observed to accompany bacteriostasis.

Correlation of the reduction in hemolysis with the observed bacteriostasis leads to the conclusion that the antihemolytic effect is secondary to bacteriostasis.

The drug regularly inhibits the wide, diffuse peripheries usually seen around colonies of beta streptococci growing in clots of tissue culture.

The drug causes the development of abnormal, long chains of streptococci.

CONCLUSIONS

Sulfanilamide is bacteriostatic for the strains of beta streptococci studied. The effect varies directly with the concentration of the drug and inversely with the number of bacteria.

The antihemolytic effect is secondary to the bacteriostatic effect. There is no evidence that the drug neutralizes hemolysin or reduces its formation beyond what can be accounted for on the basis of the reduced number of organisms involved.

The drug modifies the normal mode of division and reduces the ability of the organisms to invade the clot.

28. Czarnetsky, E. J., and Calkins, H. F.: Some Reactions of Sulfanilamide with Nucleoproteins and a Suggested Mechanism of Action of Sulfanilamide, *J. Bact.* 36: 330 (Sept.) 1938.

Life History of the Housefly.—The housefly passes through a complex metamorphosis, i. e. egg, larva (maggot), pupa and adult or fully winged insect. Under warm summer temperatures the egg stage requires about twenty hours, the larval stage about five days, the pupa about four days, a total of about ten days from egg to adult insect. This allows for the development of from ten to twelve generations in one summer.—Hermes, William B.: *Medical Entomology*, New York, Macmillan Company, 1939.

EXPERIMENTAL CHEMOTHERAPY WITH
SULFANILAMIDE AND RELATED
COMPOUNDS

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Bacterial chemotherapy has emerged from the laboratory. It is primarily in the laboratory that progress must be made in the development of more effective compounds and of compounds active against diseases as yet not influenced by chemical treatment. It is also in the laboratory that a better understanding of the mode of action of these drugs and of their toxic effects can be obtained.

I wish to discuss some aspects of the problem from a laboratory point of view. This new field has been characterized by too hasty clinical application of experimental results. Some shortcomings in our knowledge and some of the difficulties encountered in transferring results from one species to another will be brought out. This paper is not intended to be a comprehensive review of the field of bacterial chemotherapy but a discussion of certain phases of the subject with which I have had experience in the laboratory.

PHARMACOLOGIC CONSIDERATIONS

The acute toxicity of sulfanilamide for several species of higher animals has been adequately established. Given in single doses by mouth, it is tolerated in amounts of from 1.5 to 3 Gm. per kilogram, depending on the species. The work of Marshall¹ and his colleagues has added much to an understanding of the acute toxicity, absorption, distribution in the body and excretion of sulfanilamide. It must be pointed out that these toxicity values were established on normal animals. My associates and I have observed that in mice rendered extremely ill by infection and toxins, such as is seen following the injection of large numbers of meningococci of low virulence to mice, deaths were often encountered following one third of the maximum dose normally tolerated.

Of more importance to the clinician is the question of chronic toxicity, and in this our knowledge is inadequate. Marshall, Emerson and Cutting² found sulfanilamide well tolerated over a period of weeks by the rat and dog. Molitor and Robinson³ have quite recently studied the acute and chronic toxicity of sulfanilamide and benzysulfanilamide in mice, rats, dogs and rabbits. With large doses of sulfanilamide cumulative toxicity and pathologic changes were manifest. Their chronic toxicity studies on rabbits were unsatisfactory. Contrary to prevalent opinion, water increased the toxicity of sulfanilamide in their experience. We⁴ have found that in the rabbit under certain dietary restrictions from 0.5 to 1 Gm. per kilogram for two weeks produced toxic symptoms and frequent deaths.

Read before the Section on Pathology and Physiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Marshall, E. K.: Bacterial Chemotherapy: The Pharmacology of Sulfanilamide, *Physiol. Rev.* **19**: 240 (April) 1939.

2. Marshall, E. K.; Emerson, Kendall, and Cutting, W. C.: The Toxicity of Sulfanilamide, *J. A. M. A.* **110**: 252 (Jan. 22) 1938.

3. Molitor, Hans, and Robinson, Harry: Some Pharmacological and Toxicological Properties of Sulfanilamide and Benzysulfanilamide, *J. Pharmacol. & Exper. Therap.* **65**: 405 (April) 1939.

4. Rosenthal, S. M.: Studies in Chemotherapy: VIII. Some Toxic Effects of Sulfanilamide and Sulfanilyl Sulfonamide to Rabbits and Chickens, *Publ. Health Rep.* **54**: 22 (Jan. 1939).

Chickens on this dosage showed emaciation, motor weakness and a high mortality. Halpern and Mayer⁵ and Rich⁶ have also noted cumulative toxic effects in the guinea pig. Still another illustration of species variation in toxicity is seen in that frequent toxic manifestations observed in human beings such as fever, dermatitis and hematologic changes are encountered rarely or not at all in experimental animals. However, cyanosis has recently been produced in rats and chickens, and susceptible species may be found in which the other toxic effects seen in man may be produced.

In dealing with compounds of low water solubility this discrepancy between acute and chronic toxicity may be even more marked. Thus with sulfanilyl sulfanilamide the enormous single doses tolerated by animals give a misleading indication of the results obtained on repeated administration. It must therefore be concluded that the acute toxicity of this group of drugs is no reliable criterion of the effects to be obtained on their repeated administration and that considerable variation in toxic manifestations may be encountered from one species to another.

THERAPEUTIC RESULTS IN ANIMALS

There is a definite need for some standardization of the experimental assay of chemotherapeutic activity of these new drugs. Widely divergent results have been obtained in different laboratories. Apart from such factors as toxicity and the rate of absorption and excretion, therapeutic effectiveness is influenced by the dosage, the route of administration, the onset and duration of therapy, the period of observation following therapy, the strain of organism, the infecting dose and virulence of the organisms, the species and number of the animals and the condition of the animals employed.

While there is universal agreement on the activity of sulfanilamide in experimental beta hemolytic streptococcus infections, the dosage required to bring about the survival of the majority of infected mice varies from one third to one tenth of the maximum tolerated dose. At best this is not an impressive therapeutic index and emphasizes from the laboratory point of view the necessity for large doses to bring about good therapeutic results.

On pneumococcal infections in mice sulfanilamide has a less marked action, bringing about chiefly a prolongation of life.⁷ That this degree of activity cannot be accepted as valid for man is shown by the fact that sulfanilamide has a much better action in pneumococcal infections in rabbits, and in rats a high percentage of cures can be effected.⁸

The increased effectiveness of sulfapyridine against pneumococcal infections was first demonstrated by Whitby.⁹ While preliminary experiments have not

5. Halpern, B. N., and Mayer, R. L.: Toxicité expérimentale comparée de quelques substances antistreptococciques, *Presse méd.* **45**: 747, 1937.

6. Rich, A. R., and Follis, R. H., Jr.: Inhibitory Effect of Sulfanilamide on the Development of Experimental Tuberculosis in the Guinea Pig, *Bull. Johns Hopkins Hosp.* **62**: 77 (Jan.) 1938.

7. Rosenthal, S. M.; Bauer, Hugo, and Branham, S. E.: Studies in Chemotherapy: IV. Comparative Studies of Sulfonamide Compounds in Experimental Pneumococcus, Streptococcus, and Meningococcus Infections, *Publ. Health Rep.* **52**: 662 (May 21) 1937. Cooper, F. B.; Gross, Paul, and Mellon, R. R.: Action of *p*-Aminobenzenesulfonamide on Type III Pneumococcus Infections in Mice, *Proc. Soc. Exper. Biol. & Med.* **36**: 148 (March) 1937.

8. Gross, Paul, and Cooper, F. B.: Efficacy of *p*-Aminobenzenesulfonamide in Experimental Type III Pneumococcus Pneumonia of Rats, *Proc. Soc. Exper. Biol. & Med.* **36**: 225 (March), 535 (May) 1937. Cooper, F. B., and Gross, Paul, *ibid.* **36**: 678 (June) 1937. Gross, Paul, Cooper, F. B., and Peebles, M. L., *ibid.* **36**: 311 (April) 1937. Kreidler, W. A.: Treatment of Pneumococcal Infections in Rabbits with Sulfanilamide, *Proc. Soc. Exper. Biol. & Med.* **37**: 146 (Oct.) 1937. Rosenthal, Bauer and Branham.⁷

9. Whitby, L. E. H.: Chemotherapy of Bacterial Infections, *Lancet* **2**: 1095 (Nov. 12) 1938.

confirmed the uniformly high curative effects of this compound reported by him in mouse infections, results have shown a definite superiority over sulfanilamide.

The effectiveness of sulfanilamide in experimental meningococcal infections, demonstrated first by Buttle, Gray and Stephenson,¹⁰ has been amply confirmed. It should be noted that the two infections most susceptible to therapy in the laboratory, streptococcal and meningococcal, have given the most encouraging results in the clinic.

On staphylococcal infections in mice sulfanilamide has only a slight activity, but more favorable effects have been obtained with sulfanilyl sulfanilamide,¹¹ and recently with sulfapyridine.¹²

Space will permit only brief mention of the positive laboratory results in other infections. Following the successful clinical use in gonorrhea, Levaditi¹³ first demonstrated marked curative action of sulfanilamide and some related compounds in gonococcal "toxi-

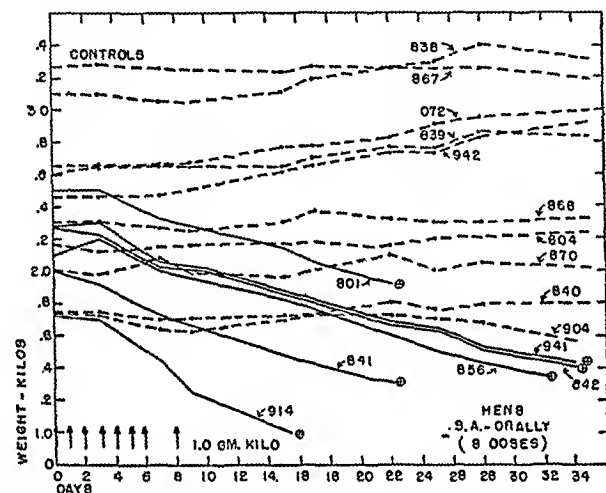


Chart 1.—Eight daily doses of 1 Gm. per kilogram of sulfanilamide to chickens caused progressive loss of weight, weakness, particularly marked in the legs, and delayed death.

infection" in mice. Levaditi¹⁴ had also demonstrated for several bacterial endotoxins a true antitoxic action for some sulfur compounds, although no effect could be shown against bacterial exotoxins.

Favorable laboratory results have been reported in infection with *Clostridium welchii*,¹⁵ *Escherichia coli*,¹⁶ brucellosis,¹⁷ *Bacillus aertryke*, *B. typhosus*¹⁸ and *B. pestis*.¹⁹ An inhibitory but not curative effect has been found in experimental tuberculosis in guinea pigs.⁶

10. Buttle, G. A. H.; Gray, W. H., and Stephenson, Doris: Protection of Mice Against Streptococcal and Other Infections by β -Aminobenzenesulfonamide and Related Substances, *Lancet* 1:1286 (June 6) 1936.

11. Mellon, R. R.; Shinn, L. E., and McBroom, Josephine: Therapy of Experimental Staphylococcus Infections with Sulfonamide Compounds, *Proc. Soc. Exper. Biol. & Med.* 37:563 (Dec.) 1937.

12. Whitby, Mayer.¹³

13. Levaditi, Constantin, and Vaisman, Aaron: La toxi-infection gonococcique expérimentale et son traitement chimiothérapique, *Presse méd.* 45:1371 (Sept. 29) 1937.

14. Levaditi, Constantin, and Vaisman, A.: Chimiothérapie antiendotoxique, *Ann. Inst. Pasteur* 61:635 (Dec.) 1938.

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Against malaria some effect has been found in monkeys but none in bird malaria.²⁰ Dr. Wooley and I have recently confirmed our earlier results²¹ of a slight protective action with Domagk's original prontosil against infections in mice with the virus of lymphocytic chorio-

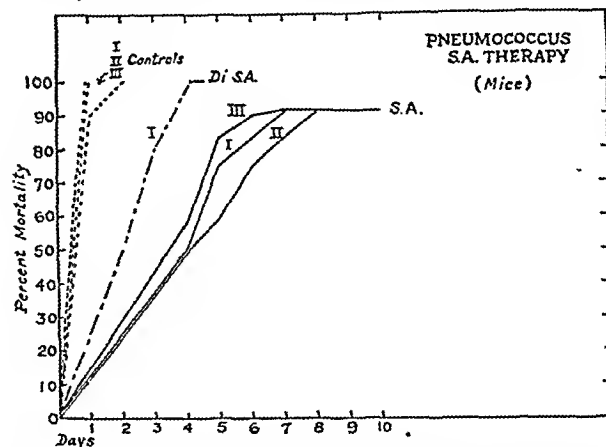


Chart 2.—Sulfanilamide and sulfanilyl sulfanilamide therapy of pneumococcal infections (Mulford strains types I, II and III) in mice. Sulfanilamide from 0.5 to 1 Gm. per kilogram given subcutaneously for from four to six days following intraperitoneal inoculation of organisms.

meningitis. Sulfanilamide was inactive. Among other virus diseases a definite curative action with sulfanilamide and some derivatives has been shown by Levaditi²² for lymphogranuloma venereum. Suggestive results with some sulfanilamide derivatives in influenza virus infections in mice have been reported by Climenko, Crossley and Northey²³ and by Oakley.²⁴ On the virus

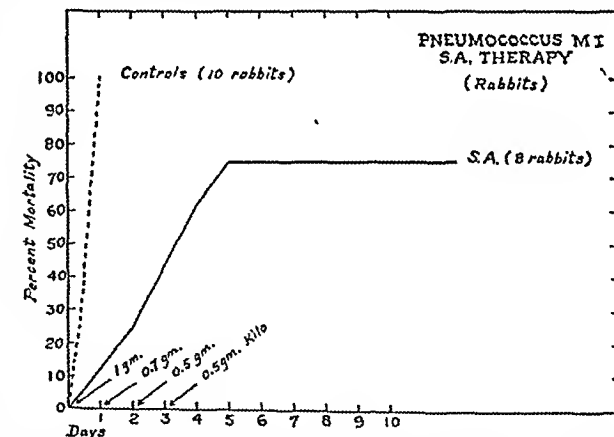


Chart 3.—Sulfanilamide therapy of type I pneumococcus in the rabbit. Infecting dose of organisms 1.5 cc of 10^{-4} intraperitoneally. Drug given subcutaneously as indicated.

of canine distemper conflicting results have been obtained since Dochez and Slanetz²⁵ first reported successes with sulfanilyl sulfanilate.

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EXPERIMENTAL CHEMOTHERAPY—ROSENTHAL

1712

COMBINED DRUG AND SERUM THERAPY

Although the opportunities previous to the discovery of prontosil for studying the relationship between drug therapy and therapy with specific serum have not been numerous, two earlier examples of a synergistic effect have been demonstrated in the laboratory. Moore²⁶ employed ethylhydrocuprine plus antiserum in pneumococcic infections in mice. In both instances a higher curative effect was obtained with combination therapy than with the use of drug or serum alone.

In our limited investigations, the results with the use of a combination of sulfanilamide and streptococcic infections in mice demonstrated in each instance a synergistic effect. The curative action was greater than the additive effects of the two agents used separately. Similar results for pneumococcic infections in mice were reported by Gross and Cooper,⁸ for streptococcic infections by Brown.³² Osgood,³³ and for meningococcic infections by Brown.³² Osgood,³³ working with in vitro cultures of bone marrow, has also reported augmented effects on pneumococci when both drug and specific antiserum were present. These results are in harmony with the concept that the drug acts directly on the organisms, in some way

infections it is difficult to bring about sterilization of the animal by brief periods of therapy, and under these circumstances a high percentage of relapses and late deaths occur. In the presence of severe infections this would emphasize the need for continued drug therapy, so that the defense forces of the body may be given

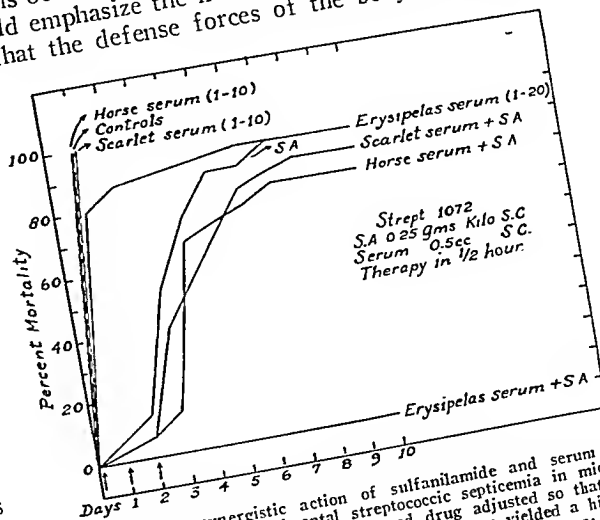


Chart 5.—The synergistic action of sulfanilamide and serum (antibacterial) therapy in experimental streptococcic septicemia in mice; ten mice to each group; dosage of serum and drug adjusted so that either alone had little curative action; combination therapy yielded a high percentage of cures; treatment given at times indicated by arrows; streptococcus originally isolated from a case of scarlet fever; similar results obtained with streptococci isolated from erysipelas and from general sepsis.

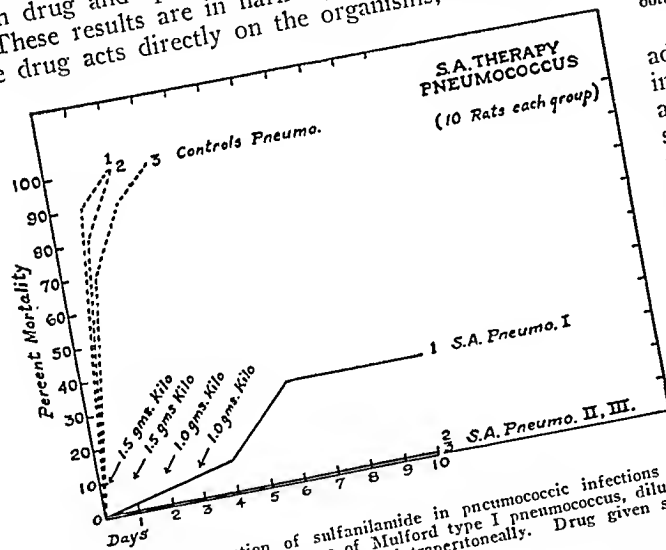


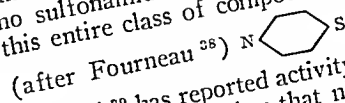
Chart 4.—The action of sulfanilamide in pneumococcic infections in rats. One cc. of broth culture of Mulford type I pneumococcus, diluted 1:10; type II, 1:10; type III, 1:10; intraperitoneally. Drug given subcutaneously as indicated at arrows.

damaging or inhibiting them, so that the final eradication of the infection can be brought about by the natural defense mechanisms of the body.³⁴ In experimental

adequate opportunity to mobilize; when such forces are inadequate, experimental observations suggest the favorable effects of employing specific serum therapy, when such is available, in addition to drug therapy. While preliminary clinical use of combination therapy is suggestive, particularly in such conditions of high mortality as pneumococcic meningitis,³⁵ further laboratory and clinical experience is needed to evaluate this procedure.

THE RELATION OF CHEMICAL STRUCTURE TO CHEMOTHERAPEUTIC ACTION

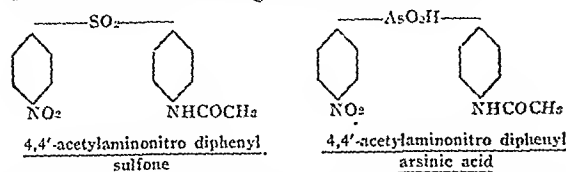
Since the discovery of prontosil, an impressive number of compounds have been investigated for antibacterial action. Of the numerous derivatives of sulfanilamide few possess greater activity than the parent compound against streptococci, but sulfapyridine is an illustration that derivatives can be obtained with enhanced activity against specific infections. The discovery by Buttle³⁶ and Fournau³⁷ that 4,4'-diaminodiphenylsulfone and certain derivatives were many times as active against streptococci as sulfanilamide marked an important advance, since these compounds contain no sulfonamide group. The active radical common to this entire class of compounds may be characterized as



Levaditi³⁹ has reported activity for dihydroxy diphenylsulfone, demonstrating that nitrogen is not in all cases necessary for activity.

26. Moore, H. F.: The Chemotherapy of Experimental Pneumococcal Infections, *J. Exper. Med.* **22**: 389, 1915.
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32. Brown, T. M.: Protective Action of Sulfanilamide and Antimeningococcus Serum on Meningococcus Infections in Mice, *Comp. Study of Hopkins Hosp.* **61**: 272 (Oct.) 1937.
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That sulfur is not essential for activity has been shown by Rosenthal and Bauer⁴⁰ in that asymmetrical arsenic derivatives analogous to the sulfones



possess antistreptococcal action. We⁴⁰ also found simultaneously with Mayer and Oechsli⁴¹ that *p*-nitrobenzoic acid



has a slight action against pneumococcal and streptococcal infections in mice. These brief examples serve to illustrate the wide chemical front along which the conquest of bacterial infections may be approached.

A survey of the numerous derivatives brings out the importance of an amino or nitro group in the para position in the benzene ring. Substitutions in the amino group of sulfanilamide are much more prone to diminish antibacterial activity than substitution in the sulfonamide group. Mayer⁴² has found that an intermediate oxidation product of the amino group, the hydroxylamine (NHOH) derivative of sulfanilamide, is highly active in the test tube against streptococci. Mayer has postulated the slow formation in the body of this derivative as the basis for activity of sulfanilamide. The hydroxylamine derivative as such (*p*-hydroxylamino-benzene sulfonamide) is unstable when injected into the body; the feeble therapeutic activity shown when this compound itself is employed is believed by Mayer to be due to its rapid breakdown. Mellon and

Following the administration of sulfanilamide, not all of the compound can be recovered as the free or acetylated derivative.¹ It is thus of importance to know more of the fate of that portion of the drug which is unaccounted for.

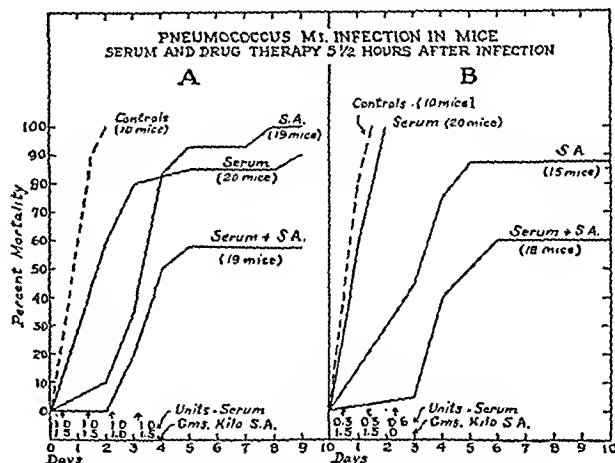


Chart 7.—The increased effectiveness of combined drug and serum therapy in type I pneumococcal infection in mice. Treatment subcutaneously begun five and one half hours after inoculation. Units of serum (Felton) and dosage of sulfanilamide are indicated by arrows on the chart.

We⁴⁴ have recently devised tests for the estimation of aromatic hydroxylamines and for further oxidation products of aromatic amino groups, that can be carried

Presence in Urine of an Hydroxylamine Derivative of Sulfanilamide Following Oral Administration of 1.5 Gm. of Sulfanilamide in 100 Cc. of Water to Two Rabbits of 2.8 and 2.65 Kg. Weight

	Urine Volume	Free Sulfanilamide	Total Sulfanilamide	Hydroxylamine Sulfanilamide
2 hrs.....	30 cc.	30 mg.	60 mg.	0.45 mg.
4 hrs.....	93 cc.	93 mg.	177 mg.	2.14 mg.
6 hrs.....	25 cc.	87 mg.	168 mg.	2.4 mg.
2 hrs.....	52 cc.	52 mg.	78 mg.	1.0 mg.
4 hrs.....	45 cc.	45 mg.	95 mg.	2.1 mg.
6 hrs.....	28 cc.	56 mg.	126 mg.	2.8 mg.

out in the presence of sulfanilamide or other aromatic amino compounds. Following the administration of sulfanilamide to rabbits, it has been possible to demonstrate from 1.5 to 5 per cent of the free sulfanilamide in the urine present as a compound giving the reactions characteristic of the hydroxylamine derivative (shown in the accompanying table).⁴⁵ This of course does not finally prove that the hydroxylamine derivative is the active agent, but it should now be possible to correlate the presence of this compound with bacteriostatic effects and to investigate further the relation of hydroxylamine derivatives and of further oxidation products of the amino group to toxicity and to therapeutic activity.

SUMMARY

The acute toxicity of sulfanilamide and related compounds is no reliable index of the toxicity to be encountered on continued administration, particularly under adverse conditions of infection or dietary restriction. Variations in the toxic manifestations of sulf-

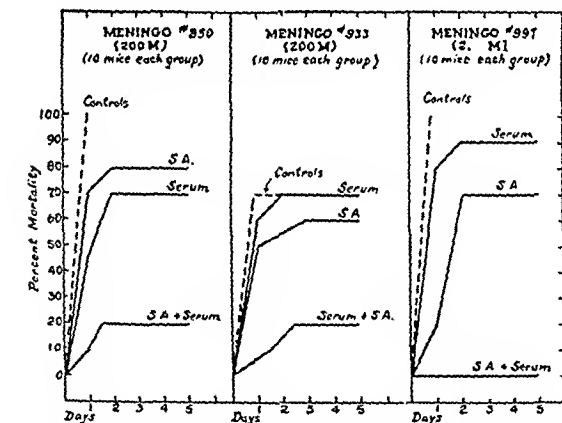


Chart 6.—Three experiments with meningococcal infections showing the marked curative effects of combined drug and serum therapy when each alone yielded poor results; treatment subcutaneously two hours after infection with 0.8 Gm. per kilogram of sulfanilamide and 0.5 cc. of 1:5 dilution of meningococcal serum.

his co-workers⁴³ have also suggested that the hydroxylamine derivative may be the active agent by virtue of its anticalase activity.

40. Rosenthal, S. M., and Bauer, Hugo: Studies in Chemotherapy: IX. Antibacterial Action of Some Aromatic Arsenic, Sulfur and Nitro Compounds, Pub. Health Rep. 54: 1317 (July 21) 1939.

41. Mayer, R. L., and Oechsli, C.: Sur une nouvelle classe de corps antibactériens: l'acide *p*-nitrobenzoïque et ses esters, Compt. rend. Soc. de Biol. 130: 211, 1939.

42. Mayer, R. L.: Recherches sur le mécanisme de l'action antistreptococcique de l'aminobenzènesulfamide et ses dérivés, Bull. Acad. de méd. 117: 727 (June 22) 1937.

43. Shinn, L. E.; Main, E. R., and Mellon, R. R.: Anticatalase Activity of Sulfanilamide and Related Compounds: II. Relation to Growth Inhibition in Pneumococcus, Proc. Soc. Exper. Biol. & Med. 29: 591 (Dec.) 1938.

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45. Similar reactions have also been obtained in the urine of dogs, of rats and of man following sulfanilamide administration.

anilamide occur in different species of animals. There is inadequate knowledge of the chronic toxic effects on laboratory animals.

Relatively large doses of sulfanilamide and repeated therapy are required to bring about a high percentage of cures in streptococcal infections in mice.

With pneumococcal infections, marked variation in response to therapy occurs with different species of animals.

Combination of sulfanilamide therapy with specific antiserum in pneumococcal, meningococcal and streptococcal infections in mice brings about more favorable results than those obtained with either type of therapy used alone.

It has been shown that sulfur is not essential to therapeutic activity. Antibacterial properties have been demonstrated for some aromatic arsenic compounds, as well as for *p*-nitro benzoic acid.

Following the oral administration of sulfanilamide to rabbits, a small percentage of an oxidation product of the amino group (hydroxylamine) has been detected in the urine. Other investigations have suggested the possible significance of this derivative in the mechanism of action of sulfanilamide.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. KING ET AL. AND DR. ROSENTHAL

DR. CHARLES L. FOX JR., Boston: The paper of Dr. King and his co-workers is interesting but I would make one observation to be considered in evaluating some of his facts. Hourly bacterial counts of cultures with sulfanilamide (10 mg. per hundred cubic centimeters) and controls without sulfanilamide show these three features: For the first three hours growth is equal in the two. Then the control proceeds along the logarithmic phase of growth whereas the sulfanilamide culture grows but slightly until the eighth or ninth hour. Then this period of bacteriostasis (from the third to the ninth hour) ends and the sulfanilamide culture grows out equaling the control. If, therefore, one has not observed the culture between about three hours and about eight hours, one is likely not to see any bacteriostatic effect whatever. In table 5 which Dr. King showed, and in all his observations, I believe the first observation of the colony was at nine hours. His other observations were at about twelve hours. If one considers this fact, one will recognize that the major effect of the drug occurs between about the third and the ninth hour, but after nine hours one is not going to see so much effect. It may be possible to recognize that a culture the growth of which has been held up for three or four hours here at this time, at about seven or eight hours, is a younger and possibly a more actively growing culture than the control which has been growing vigorously during that period. There may be a possibility that this increased hemolytic effect of the organism grown in sulfanilamide is due to the fact that his observations, beginning at about nine hours, are on cultures with controls which are not growing as actively at this stage as the sulfanilamide cultures. In evaluating all sulfanilamide studies, I think it must be realized that the major effect of the drug occurs between about the third and the ninth hour.

DR. SANFORD M. ROSENTHAL, Washington, D. C.: I think we are all on the right track in mechanism, but I just want to add that most of our work has been in the test tube and that all mechanisms of action based on *in vitro* experiments remain theories until they are demonstrable in the living organism. I feel that we now have to take our test tube work over into the animals to see whether the same thing applies. I should like to ask Dr. Shinn whether he has studied the blood of animals or human beings under sulfanilamide for the catalase activity or for peroxide content.

DR. JOSEPH T. KING, Minneapolis: The question was raised by Dr. Fox whether with this method one might overlook an important phase of the bacteriostatic action of sulfanilamide

during the early part of the incubation period. Since the diameter of the colony is used as the index of growth rate in this medium, no information exists concerning growth until the colonies can be measured microscopically. In the medium without erythrocytes the colonies usually appear between the fourth and the sixth hour of incubation. On the basis of colony diameter the maximal bacteriostatic effect of the drug occurs at a point in time later than that at which colonies become measurable in both experimental and control cultures. Dr. Fox also pointed out that, although the growth curve of cultures containing sulfanilamide is usually greatly retarded in the early part of the incubation period, it may eventually rise above the control and he raised the question whether this might account for the higher hemolytic index observed in our cultures. With my technic I usually observe a decrease in the bacteriostatic action of the drug following the maximum, which usually occurs somewhere near the twenty-four hour period. This tendency is probably more pronounced when the cultures contain erythrocytes. I have never observed the bacteriostatic action to fail completely—the experimental colonies never become larger than the controls in this medium. This fundamental difference between fluid mediums and tissue culture clots where the organisms grow as colonies must be kept in mind when interpreting results. In any event this suggestion could hardly account for the fact that a higher hemolytic index is found in cultures containing sulfanilamide, since this term expresses the hemolyzing power of a colony in relation to its size, i. e. the diameter of the hemolytic zone divided by the diameter of the colony. The absolute amount of hemolysis is less in experimental cultures than in controls. The experimental colonies produce wide zones of hemolysis in relation to their size.

L. E. SHINN, PH.D., Pittsburgh: With regard to the paper of Dr. Rosenthal, I am glad to see some one embark on a study of compounds other than the interminable ringing of changes on the amino attached to the sulfur. So far as I know, no one has made any systematic efforts to get at the real fundamentals of the structure, replacing the sulfur with other substances and making the changes in the heart of the molecule, so to speak. We have begun work similar to that which he has discussed with regard to the benzoic acid. I am preparing to do some work on arsenicals in the belief that that group, the group which is now the sulfonamide group, is not in itself particularly important or critical. From my point of view, the action of that group probably lies in its influence on the amino group. Its effect is indirect, unstabilizing the amino group to just the right degree. Dr. Rosenthal asked whether I had examined the tissue fluids of animals or human beings with regard to the anticalase mechanism, production of hydroxylamine, and so on. I must say that I have not. I had considered it hopeless to hunt for the hydroxylamine derivative *in vivo*. The question was raised as to what is going to be done with some other organisms—the staphylococcus, the diphtheria bacillus, *B. coli* and the gonococcus. On that question I cannot say very much. I feel that we are going to find in those organisms factors which will allow the application of this or a very similar theory in explanation of mechanism. For example, the gonococcus is presumed to be a producer of an appreciable amount of catalase and, since it is a producer of catalase, one must presume that that catalase serves some purpose. The indication would be that the organism is extremely susceptible to hydrogen peroxide and therefore that interference with catalase may be even more effective.

DR. I. S. RAVDIN, Philadelphia: The workers who believe that anticalase activity is responsible for the mode of action of sulfanilamide must explain why this drug is effective against the colon bacillus, which grows well in the presence of hydrogen peroxide. The explanations advanced this morning must not be accepted as proofs of the mode of action of these very interesting and useful substances but further work must be awaited.

DR. FOX: Dr. Rosenthal said he would like further evidence as to the presence in the blood of patients or animals of some of these compounds which assumedly are formed from sulfanilamide *in vivo*. That evidence has been difficult to get.

We have taken specimens of blood of sulfanilamide treated patients and, by using the recording spectrophotometer at the Massachusetts Institute of Technology, have been able to get a smooth line curve of the transmission spectrum of the blood of these patients. Such blood almost always contains methemoglobin, as many others have shown, and sometimes sulfhemoglobin, but, in addition, in the red end of the spectrum, where hemoglobin absorbs but slightly, there is a residual absorption. The human eye is but slightly sensitive, and the ordinary spectrophotometer is less accurate in the region above 650 millimicrons. With the recording spectrophotometer we have gone from 400 to 700 millimicrons. From about 650 to 700 millimicrons there is definite absorption strikingly similar to the absorption by the products of the ultraviolet irradiation of sulfanilamide. Important additional evidence for the presence of these oxidation products in patients' blood is that, added *in vitro*, these products convert hemoglobin to methemoglobin. Sulfanilamide itself has absolutely no such effect. Dr. Rosenthal said that the compound nitrosobenzene, the oxidized form, is bacteriostatic. I have found that addition of a paradimethylamine group produced a compound 100 times more bacteriostatic than nitrosobenzene. These substances are reversible oxidizing systems and *in vitro*, in mice, produce fatal methemoglobinemia so that therapeutic tests were unsuccessful.

SEROLOGIC DISCREPANCIES IN SYPHILIS

THE POSITIVE HINTON-NEGATIVE WASSERMANN PROBLEM

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AND

LEON F. RAY, M.D.

PORTLAND, ORE.

The occurrence of a positive Hinton with a negative Wassermann reaction in patients with late syphilis gives rise to delicate problems of diagnosis as well as to the question of activity in old cases and the advisability of further treatment. The first technic of the Hinton test¹ was adopted for routine use at the Massachusetts General Hospital in 1929. The present method,² which is comparable to the Eagle, Kahn, Kline and Kolmer tests as to specificity and surpasses them in sensitivity,³ is similar in principle to the Eagle, Kahn and Kline tests. When the Hinton test was first used at the Massachusetts General Hospital it was applied to all bloods in conjunction with the Wassermann test. The technic of the latter test is a modification of the standard Wassermann test.⁴ A general agreement between the two tests led to the practice of omitting the Wassermann test unless the Hinton test was positive. When an additional check was desired, a portion of the specimen was sent to the Massachusetts State Board of Health Laboratory, where the Hinton technic is under the supervision of its originator. With the pas-

sage of time, however, cases exhibiting a disagreement between the two tests gradually accumulated.

In new infections, the development of increased sensitivity in tests for syphilis facilitated diagnosis. In late syphilis, however, more delicate tests increased the importance of demonstrating clinical evidence of the disease. The specificity of blood serologic reports might otherwise be open to question. The results of nationwide serologic conferences for evaluation by the United States Public Health Service indicate that these highly sensitive technics are accurate. The extensive application of such methods of blood examination has given rise to many intricate and perplexing problems. Some doubts arose when new technics produced a positive reaction accompanied by a simultaneous negative report with an older standard test. In early syphilis "serologic cures" were delayed, with a corresponding increase in serofast cases. In late syphilis, especially the asymptomatic group, still more difficulties appeared. It was questioned whether persistently positive serologic examinations by such delicate technics meant continued activity of the disease. Criteria of adequate therapy were consequently open to further consideration. Many old Wassermann-negative cases exhibited positive reactions to the new tests. Likewise, numerous unsuspected cases appeared which were negative by older methods. Some clinicians doubted that a positive report by such sensitive procedures meant syphilis in the face of a negative Wassermann reaction unless other evidence was provided. Cannon⁵ stated that a properly controlled "4 plus" Wassermann reaction meant active syphilis in need of treatment, with certain exceptions including yaws and leprosy. Can his statement be applied as well to the more sensitive tests? Kolmer⁶ expressed the opinion that serologic positivity in an apparently healthy person, even with previous adequate therapy, indicated the persistence of syphilitic infection. He further stated that serologic relapse meant renewed activity of foci of the disease. Kolmer also indicated that therapy was needed to aid immunity and prevent progression of the disease. Can such beliefs be applied to cases exhibiting a positive serologic reaction by sensitive methods when the Wassermann reaction is negative? The questions are partially answered by the ratings of accuracy attained by many of the sensitive tests in the reports of serologic congresses. We have attempted to clarify some of these problems from the clinical aspect by the following work.

DATA

In the period from July 1936 to July 1938 there were 2,862 new admissions to the syphilis clinic at the Massachusetts General Hospital. Excluding early syphilis, there were 335 cases (11.7 per cent of the total) which were found to have a positive Hinton and a negative Wassermann reaction on the first blood serologic examination. During the same period 1,078 cases of syphilis were diagnosed, so that these 335 patients comprised 31 per cent of the actual cases of syphilis admitted. This group was chosen for the present study without further criteria of selection. Early syphilis of less than two years' duration was excluded because such cases would present more of a question of adequacy of therapy than a serologic problem. During the same period of time approximately 40,000 specimens of blood

From the Massachusetts General Hospital, Department of Dermatology and Syphilology, Dr. C. Guy Lane, chief.

Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

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SEROLOGIC DISCREPANCIES—CRAWFORD AND RAY

Jour. A. M.
Nov. 4, 19.

were tested in the hospital laboratory; 21,073 of these were on new cases admitted to various departments. By a thorough investigation of the 335 patients with late syphilis exhibiting a positive Hinton and a negative Wassermann reaction, it was hoped that a base line could be established as to the meaning of such a serologic status. They were considered especially in the light of diagnosis, activity of syphilis and need of further

evidence was gathered, analysis revealed that the diagnoses were made as indicated in table 2. The average age of these 155 patients was 43.7 years. In ninety-six cases in which the duration was known the disease had been present for an average of 23.7 years. There were twenty-five patients with congenital syphilis whose average age was 24.7 years. Among the males with an average age of 50.4 years; the ages of fifty-one females averaged 42.3 years. Further study of the latent, active and congenital subdivisions revealed some pertinent information: It was of interest to note that of thirty-nine patients with evidence of activity of the disease the average duration in eighteen known instances was 21.5 years. Among ninety-one inactive cases, the average duration in fifty-three in which those observers who feel that syphilis does not actually become "latent" and that some therapy, if tolerated, should be continued as long as there is detectable reagin in the blood. Also it was found that the thirteen patients with active congenital syphilis averaged 25.3 years of age. This is indicative of the necessity of lengthening the time wherein many observers feel that active syphilis exists. We are inclined to agree with those who believe that there is no time, regardless of the duration of the infection, at which syphilis may be trusted to remain inactive. This may apply to congenital as well as to acquired cases. The older group of patients with congenital syphilis should not be therapeutically neglected merely because they have grown to maturity without disabling lesions.

The effect of previous treatment is illustrated in table 3. These calculations bear out the already proved fact that any treatment is better than none. Among the untreated cases 33 per cent were active, whereas of those with even less than twenty-five injections less than 15 per cent showed active syphilis. This group of cases, wherein much confirmatory evidence was found,

TABLE 1.—A Study of the Positive Hinton-Negative Wassermann Problem

	Number of Cases	Per Cent
A. Positive Hinton plus positive evidence of syphilis	155	46.3
B. Positive Hinton plus suspicious evidence of syphilis	36	10.7
C. Positive Hinton plus no evidence of syphilis	54	16.2
D. Doubtful or undecided cases	42	12.5
E. Not syphilis	48	14.3
Totals	335	100.0

TABLE 2.—Bases of Diagnoses in Group A

	No. of Cases
Three or more positive Hinton reactions plus:	
1. History of syphilis	63
2. Physical evidence	8
3. Positive Wassermann	11
4. History and physical evidence	32
5. History and positive Wassermann	18
6. Physical and positive Wassermann	6
7. Physical and positive spinal fluid	8
8. History, physical evidence and positive Wassermann	6
9. History, physical evidence and positive spinal fluid	4
Total	155

treatment. At the outset relatively few cases presented distinct evidence of syphilis; the positive Hinton reaction was the only reason for observation of the disease was seriously doubted. After more careful history taking, physical examinations, repeated serologic checks and other diagnostic measures, definite additional proof of syphilis appeared in nearly half of the cases. The final grouping of the series appears in table 1. The diagnosis of syphilis was made in groups A, B and C, in which each patient had three or more positive Hinton reactions. In groups D and E there was disagreement in blood reports. Each group will be considered separately.

Group A.—In this group of 155 patients positive evidence of syphilis was found, each case averaging 2.4 indications of the disease in addition to the positive Hinton reaction. In the history the additional evidence consisted of a story of a primary sore, secondary manifestations, tertiary lesions, disturbances of the central nervous system, miscarriages, stillbirths, interstitial keratitis or previous therapy. The family history included known syphilis in the husband or wife, child, sibling or parent. On physical examination the additional signs consisted of mucocutaneous scars, osseous lesions (septal perforations, saddle nose, dental changes and Charcot's joints), ocular lesions (pupillary changes, interstitial keratitis, optic atrophy, choroiditis), neurosyphilis. Laboratory evidence of syphilis other than the positive Hinton reaction included subsequent positive Wassermann reports, positive changes in the cerebrospinal fluid, x-ray evidence of syphilitic cardiovascular lesions and one autopsy showing syphilis. When all the

illustrated not only the value of routine serologic tests of the blood but also the importance of a good follow-up in establishing a diagnosis of syphilis. Group B.—The thirty-six patients in this group all had four or more positive Hinton reactions and presented in addition some suggestive evidence of syphilis. The blood Wassermann reaction remained negative in all cases. A summary of this group is presented in table 4.

TABLE 3.—Results of Previous Treatment

Amount of Treatment	Active Cases	Inactive Cases	Total Cases
Twenty-five or more injections	7	38	45
Less than 25 injections	5	29	34
None	25	51	76

TABLE 4.—Group B: Bases of Diagnoses

	Cases
Four or more positive Hinton reactions plus:	
1. History suggesting syphilis	15
2. Physical conditions suggesting syphilis*	9
3. Suspicious history and physical evidence	12
Total	36

* Two cases also showed roentgenologic evidence suggesting cardiovascular syphilis.

The average age of group B patients was 47.1 years. Since the history and physical evidence were not conclusive, cases of congenital syphilis could not be definitely segregated. A suggestive history consisted of dubious genital lesions, indistinct eruptions, possible iritis, and miscarriages or stillbirths of doubtful significance. There was a suspicion of syphilis in some member of the family in one fifth of these cases.

TABLE 5.—Group B: Additional Studies

	Cases
1. Corroboration of positive Hinton by other laboratories.....	25
2. Spinal fluid examinations (all negative).....	19
3. Cardiovascular x-ray studies (2 suspicious and 8 negative)...	10

TABLE 6.—Group C: Additional Studies

	Cases
1. Corroboration of positive Hinton reaction by state laboratory	35
2. Spinal fluid examinations (all negative).....	28
3. Cardiovascular x-ray studies (all negative).....	12

Indecisive physical lesions were inconclusive scars, osseous changes, dental changes, facies, pupillary aberrations, dubious old choroiditis or optic atrophy, other suspicious neurologic lesions, questionable cardiovascular damage and gastritis. Additional investigations are given in table 5.

GROUP C.—The fifty-four cases included here were diagnosed as syphilis on the basis of persistently positive Hinton reactions alone. This seemed justified in the light of such observers as Moore,⁷ who stated that, if a precipitation test is reliable, a series of positive reactions must be considered of the same significance as a series of positive Wassermann reactions. The Hinton test appeared to fulfil this criterion and should mean syphilis when persistently positive, regardless of negative Wassermann reactions. Five or more positive reactions were obtained here in each case; no evidence other than this was afforded. The average age in this group was 46.3 years. Additional investigations are given in table 6.

After having studied and tabulated the first two groups of cases (A and B) there was no hesitancy in our minds about making a diagnosis of syphilis in group C. Yaws and leprosy could be eliminated without difficulty; malaria was ruled out as far as possible by the anamnesis. The five blood examinations which gave consistently positive results were done over an average period of 9.8 months in all cases. This time factor should rule out the few diseases which are thought to cause a temporary positive reaction. The cases in this group comply with the criteria generally used to denote true latent syphilis.

GROUP D.—In this group there were forty-two cases that have not been classified. It was impossible to decide whether these patients had syphilis or were free of the disease. After the initial positive Hinton reaction the reports vacillated repeatedly. There was nothing in the personal or family history to suggest syphilis, nor was there a story of any disease which might have given rise to a "false positive" report. No physical evidence was found to suggest syphilitic damage. The

average age was 40.2 years. These patients have been followed for an average period of 10.2 months each. A summary of the data in this group appears in table 7.

Disagreements in the blood serologic reports were pronounced in this group. Additional checking by sending split samples simultaneously to two laboratories did not settle the question in these cases because of the failure of the results to coincide. This fact is demonstrated in table 8.

An example of the type of case encountered in this group is given in table 9.

It is possible that many of these patients had syphilis and perhaps some did not. From the clinical standpoint there was no way to decide. From a purely serologic aspect the discrepancies in reports precluded an accurate decision. It seemed that ten months should be long enough in which to decide whether most patients had syphilis, but when the data given were considered from the practical point of view the problem was not always clear.

GROUP E.—It was felt that in all probability the forty-eight patients in this group did not have syphilis. In each case there was a single positive Hinton reaction followed by several negative reactions. The initial positive reaction was followed by three or four negative reactions over a period of 10.5 months average time. Here again there was no history or physical evidence of syphilis in any case. The average age was 38.4 years. Every attempt was made to rule out any condition which might possibly have given rise to a tem-

TABLE 7.—Group D: Forty-Two Undecided Cases with Serologic Discrepancies

Blood Serologic Data	Average No. per Case
1. Positive Hinton reactions.....	2.1
2. Doubtful Hinton reactions.....	0.6
3. Negative Hinton reactions.....	3.1
Total average number of tests.....	5.8
Additional Studies	Cases
1. Hinton test done by state laboratory.....	31
2. Spinal fluid examinations (all negative).....	10
3. Cardiovascular x-ray studies (all negative)	4

TABLE 8.—Comparison of Discrepancies in Two Laboratories in Group D*

	Cases
State laboratory (31 cases)	
1. Hinton positive	7
2. Hinton negative	24
3. Subsequent disagreement in the same laboratory.....	5
Massachusetts General Hospital laboratory (42 cases)	
1. Hinton positive	40
2. Hinton negative	2
3. Subsequent disagreement in the same laboratory.....	26

* Discrepancies between reports from the two laboratories occurred in twenty-four cases.

porary false report, since haptens or "partial antigens" are thought to cause such reactions in some diseases. Table 10 presents the data on these patients. Serologic discrepancies were less pronounced in this group, as is reflected in table 11.

The question of "false positive" reactions arose in this group, and the series of subsequent negative tests in these cases indicated such a situation. These forty-eight patients comprised 13.7 per cent of the 335 cases

7. Moore, J. E.: The Modern Treatment of Syphilis, Springfield, Ill., Charles C. Thomas, 1933, p. 465.

studied, which was an undue number of false positive reactions for a test which has stood high in the conferences on serologic tests recently held. When computed on the basis of the state laboratory reports alone, in which only three positive reactions were obtained, less than 1 per cent of false positive reactions would exist. This was in agreement with the accepted status of the Hinton test. Some degree of error exists, however, in that not all cases were checked by the state laboratory. This situation implies that the Hinton test

reports on these ninety patients was 171. If computed on the basis of this number of tests against the total number of blood specimens examined by the laboratory during this period, approximately the same percentage of false positives is calculated.

The occurrence of false positive reactions can be attributed with certainty to such oriental diseases as yaws, relapsing fever and trypanosomiasis. Leprosy and malaria show false positive reactions less often. Hyperpyrexia, hemorrhagic diseases and jaundice are highly controversial. All these conditions were ruled out as far as possible in the present study. When a case showed occasional positive results interspersed among several negative ones, it may have been due to a fluctuating and very low reagin titer. Some good authorities construe such cases as being definitely syphilitic. Other observers feel that these serums contain some unknown substance which may be detected by a given test and that in the absence of clinical corroboration there is no syphilis present. There were nineteen cases in group D which exhibited this vacillating type of serologic status. Perhaps these were the only truly false positive cases. The rest of group D showed two

TABLE 9.—*Example of Case in Group D*

	Date	Serologic Tests	
		Hinton	Wassermann
History: L. A., a man aged 42, in February 1938 complained of discomfort in the lower part of the abdomen of 4 years' duration; the past, family and marital histories were entirely negative for syphilis			
Physical examination: Three complete physical examinations by three different physicians over a period of 10 months were entirely negative for clinical evidences of syphilis	2/ 8/38 2/11/38 3/ 5/38	Pos. Pos. Pos.	Neg. Neg. Neg.
Laboratory studies:		(State)	
Spinal fluid:	3/ 5/38	Neg.	
Cells 0			
Total protein 21			
Wassermann reaction negative	3/10/38	Pos.	Neg.
Colloidal gold curve 0000000000			
Blood counts, urine and stool were normal	5/31/38	Neg.	Neg.
Gastrointestinal and cardiovascular x-ray studies were negative			
Gastroscopic examination showed superficial and hypertrophic gastritis	7/ 7/38	Pos.	Neg.
Serologic examination on wife negative	12/10/38	Neg.	Neg.

as done in the laboratory at the Massachusetts General Hospital was lacking in specificity. A tabulation of the chronologic occurrence of these false positive reactions, compared with the number of reports received per month, showed a direct ratio of incidence. That is, more were found in those months during which most of the cases were picked up.

This group showed the value of comparative serologic data between laboratories, even for the better hospitals. It also emphasized the absolute necessity of checking and rechecking a positive serologic reaction of the blood when other evidence is lacking.

"FALSE POSITIVES"

In order to compute the true percentage of false positive reports it was necessary to use the total number of new bloods tested in the laboratory during the

TABLE 10.—*Group E: Forty-Eight Patients Not Having Syphilis*

Blood Serologic Data	Average No. per Patient
1. Positive Hinton tests.....	1.0
2. Doubtful Hinton tests.....	0.2
3. Negative Hinton tests.....	4.0
Total average number of tests.....	5.2
Additional Studies	Cases
1. Hinton test done by state laboratory.....	34
2. Spinal fluid examinations (all negative).....	4
3. Cardiovascular x-ray studies (all negative).....	9

twenty-four months which this study included. There were 21,073 new patients who had serologic examinations of the blood during this time. To allow for the widest possible margin of error, all of both groups D and E were included, which made a total of ninety possible cases, which would be 0.42 per cent of false positives. The total number of positive and doubtful

TABLE 11.—*Comparison of Hinton Reports from Two Laboratories*

	Cases
State laboratory (34 cases)	
1. Hinton positive	3
2. Hinton negative	31
3. Subsequent disagreement in the same laboratory..... (Two positives later negative, one not repeated at state laboratory)	2
Massachusetts General Hospital laboratory (48 cases)	
1. Hinton positive	40
2. Hinton negative	2
3. Subsequent disagreement in the same laboratory..... (All positives later repeatedly negative)	40
Discrepancies between the two laboratories.....	34
No case positive in both laboratories	
Only 2 cases positive at state laboratory and negative at Massachusetts General Hospital laboratory	

or more positive or doubtful reactions followed by several negative reactions. It is possible that such patients showed a fading reagin titer just at the time at which it passed below a detectable level. A mistaken report or technical error occurring twice per case seemed most unlikely in so many instances.

The cases in group E, however, were in all probability merely falsely positive in the sense of "technical errors." A single positive reaction was followed by repeated negative reactions in each instance. Possible disease causes of a temporary false positive reaction were ruled out. Technical errors in such cases may be due to improper technic in the performance of the test, the skill of the individual technician, human fallibility in reading the tests, errors in labeling the tubes and mistakes in reporting the results. The occurrence of only forty-two such cases among 21,073 new serologic examinations provided the extremely low figure of 0.2 per cent in the two year period. Other situations that give rise to false positive or anticomplementary reactions in the complement fixation tests do not need to be considered here. These include bacterial or chemical contamination, the presence of a high concentration of a drug in the serum and an excess of native amboceptor. Many such factors which may inhibit complement fixation have no effect on the flocculation phenomenon and hence may be disregarded.

SEROLOGIC DISCREPANCIES—CRAWFORD AND RAY

1719

SUMMARY

Of 2,862 new patients admitted to the syphilis clinic at the Massachusetts General Hospital in a two year period, 335 late cases showed a positive Hinton and a negative Wassermann reaction. This group was studied exhaustively for additional evidence of syphilis. Nearly 50 per cent of these patients were found to exhibit a history or physical or laboratory evidence of the disease along with a repeatedly positive Hinton reaction. Another 25 per cent of these patients were diagnosed as syphilitic on the basis of a persistently positive Hinton reaction alone. In 12.5 per cent of the 335 cases a vacillating serologic reaction and lack of other evidence created indecision as to the presence or absence of syphilis. In the remaining 14.3 per cent of these cases the one initial positive reaction followed by repeated negative reactions was held to be a technical error.

The average age of the entire group was 42.8 years. The known average duration of syphilis in the clinically active group was 21.5 years in acquired cases. The average age of congenital syphilitic patients with active disease was 25.3 years, the eldest of whom was 30.

False positive reports were computed to allow for the widest possible margin of error. All undecided cases and all technical errors were included. Comparing this number to all new specimens examined by the laboratory during the time of the study, a figure of 0.42 per cent of false positives was obtained. This corroborated clinically the high degree of specificity attained by the Hinton test in congresses on serologic tests.

ABSTRACT OF DISCUSSION

DR. C. GUY LANE, Boston: The paper of Dr. Crawford and Dr. Ray adds to the evidence, if any is necessary, of the value of serologic tests in the detection of syphilis. Secondly, this work indicates the frequency with which confirmatory evidence can be found on careful study. We are impressed with the development of other manifestations of syphilis when patients with positive serologic reaction are examined carefully, and the authors have given us additional evidence of the possibility of the detection of such manifestations. In this particular series, some 50 per cent of the cases in which a positive serum reaction of the blood is present in the beginning can be taken out of the group of latent cases and diagnosed as symptomatic tertiary cases by the finding of other evidence. These figures also emphasize the importance of the latent group of syphilis today. While there are only some 14 per cent of true latent cases in this series, a review of the records in our clinic at the Massachusetts General Hospital over a five year period in which some 2,800 cases have been diagnosed as syphilis discloses that about 1,600, or 60 per cent, are diagnosed as latent syphilis. This study also shows again the unreliability of a single serologic examination. This fact must be reiterated to general practitioners, to other physicians and to the public as well. A press release of the Public Health Service the other day depicted premarital and antepartum serologic examination or blood test without reference to other examination or the need for checking up on those particular tests. The same flaw appears in the premarital and antepartum laws in the various states. There should be equal emphasis at least on further examination and further check-up of cases in which a single serologic positive is found. Finally this paper emphasizes the desirability of more than one type of test in our judgment of cases. For example, take the figures of our own clinic, with about 1,000 cases a year admitted for examination with reference to syphilis. Here are about 350 cases of serologic discrepancy in a two year period, a rather large percentage of cases in which a discrepancy has arisen. Therefore a test by a second method is of value in that it may in the first place aid the diagnosis by agreement; secondly, the second test may point to the diagnosis by the development of other evidence perhaps because of the mere positivity of the

second test and a negativity of the first test; and thirdly, the mere fact of the disagreement between the two tests may lead to a further detailed examination which may be entirely negative, and therefore the patient can be discharged because of the lack of evidence.

DR. G. V. KULCHAR, San Francisco: Drs. Crawford and Ray have well emphasized the necessity for repeated serologic examinations for the diagnosis of syphilis in the absence of clinical evidence. That is a fact that needs reemphasis. One would expect every case that gives a positive Hinton reaction to give a positive Wassermann reaction. This is not true, and it is explainable on the fact that the Hinton test as shown by the serologic ratings is much more sensitive than some of the older Wassermann tests. Does a positive Hinton reaction always mean syphilis? I have shown that there is a reagin-like substance in the serum of normal persons. Accepting that, it seems conceivable, though the data are not convincing as yet, that some intercurrent condition such as diabetes, menstruation or infectious mononucleosis fever may cause an increase in this reagin substance such as occurs following the injection of neoarsphenamine in nonsyphilitic persons to bring it up well within the range of positivity to the ordinary serologic test. I think this may explain the positive, transitory-positive Wassermann reactions that are observed during febrile states, in tuberculosis, and particularly in diabetes, in infectious mononucleosis. There is another angle. The frequent positive Wassermann reaction noted in malaria in the absence of syphilis is thought to be due to a reversal of the normal serum albumin-globulin ratio. A reversal of this serum albumin-globulin ratio, of course, takes place in other diseases. Changes in the serum albumin-globulin ratio occur in lymphopathia venereum. Lymphopathia venereum is one of the diseases reputed to have given a false positive Wassermann reaction. So we must look on the Wassermann test not as a specific but as a nonspecific test, which, like all nonspecific tests, is subject to error. Does a positive Hinton reaction necessarily mean active syphilis in a syphilitic patient? Now the studies of the Cooperative Clinical Group I think have indicated pretty definitely the benignity of late latent syphilis. Taking this along with the studies of Bruusgaard, there seems no great need of treating patients in late latency. In a person who is first seen twenty years or more after his infection, in whom the cerebrospinal fluid is negative, who is long past his period of infectivity and who through fluoroscopy and as far as one can go through physical examination presents no evidence of cardiovascular syphilis, we know his chances of developing a serious lesion from syphilis are relatively slight. So it does seem rather unnecessary to subject these patients to the hazards of treatment. Their possibilities of going through life without any evidence of syphilis so far as their physical well being is concerned are relatively good and the occasional patient who will develop a tertiary skin lesion does not justify treating every one of these patients.

DR. CHARLES R. REIN, New York: Drs. Crawford and Ray have again shown the importance of more sensitive serologic tests for the detection of syphilis. With the use of such tests they were able to detect cases of serologic syphilis which would have passed undiagnosed with the less sensitive tests. Recent serologic conferences held in the United States have demonstrated that there are at least five tests commonly used in this country which possess satisfactory specificity and adequate sensitivity. Dermatologists, however, should encourage the development and use of still more sensitive tests with satisfactory specificity by serologists. Such tests would detect more cases of so-called seronegative syphilis. The interpretation of the results obtained with such tests should be made by specialists.

DR. ARTHUR SCHUCH, Dallas, Texas: One word of criticism can be offered in spite of the fact that this is an excellent study: the serologic tests done in this particular study were based on comparatively few standard serologic tests. I mean the study as presented by the authors was based on the Hinton flocculation test and some Wassermann procedure. There are at least five standard serologic tests—the Kolmer Wassermann, the Hinton, the Kline, the Kahn and the Eagle. To base a study on two of the five and draw the conclusions that have been drawn seems specious. For the last few years we in Dallas who have been working with syphilis patients have used as a routine at

least three of these tests, and incidentally the technic is exactly as described by the originators, namely Kolmer, Kahn and Kline, and in the last two years we have added to that the Eagle complement fixation test and Eagle flocculation test. Now our routine procedure is to do not two or three sero-diagnostic tests on the blood but five in parallel. This has taught us a few things. It has taught us much about the relative sensitivity of these various tests. It has taught us something about false positive tests in what we think are apparently normal individuals. I am talking from the standpoint of the clinician and not from the standpoint of the serodiagnostician. At the serologic conference in Hot Springs last fall the clinicians were in the minority. Here the laboratory diagnosticians are in the minority. So I think it is a matter of one's point of view as to whether we regard group C, D and E the authors had on slide 1 in the doubtful group, or whether we include just group D and E. Group C was the group in which the diagnosis of syphilis was made solely on a positive Hinton test or a very sensitive flocculation test for syphilis. It will take observation over a long period of years to determine whether group C, as the authors presented it, did have syphilis or did not. The group of individuals that Dr. Ryan spoke about indicating that it all depends on how sensitive a serologic test is as to whether or not it has prognostic import, with special reference to early syphilis, I think can be placed to one side. We have dark field examination to help us there make a definite diagnosis. The important group to consider is not the early syphilitic patient who is beginning to go into serologic positivity, but the enormous group that Dr. Lane spoke of. In my experience it is at least 60 per cent of our entire clinic clientele, and in the last two years we have thoroughly examined, not merely serologically and cursorily speaking from a clinical standpoint, 5,400 new patients with syphilis.

DR. G. MARSHALL CRAWFORD, Boston: Thank you for this generous discussion. Dr. Lane brought out two points that I didn't have time to emphasize: the matter of having several tests to establish the diagnosis and also to use different laboratories. I am also indebted to Dr. Kulchar for mentioning the reagin-like substance. I covered that in one sentence, saying that some men believe there is a substance which will occasionally show positives by certain tests. The elaboration by Dr. Kulchar was quite enlightening. I should like to repeat that the observation of these cases extended over a period of nine to ten months, so that temporary causes of an increase in their reagin-like substance should be eliminated. Whether a positive Hinton reaction means activity of syphilis and whether these patients should be treated were points I expected to see raised and was glad to hear. We do not feel that all these patients should be given intensive therapy. It has been our policy to treat only definitely active syphilis intensively and the others on an intermittent plan. Some very notable observers say that the human mechanism is not capable of conquering the syphilitic infection without help. We usually give them a short course once or twice a year. The hazards of the complement fixation test were also mentioned; they are largely avoided by the flocculation or precipitation test. I was glad to hear Dr. Rein mention the possibility that there is no seronegative stage. As long as there is some reagin present there must be something going on to produce that reagin. Dr. Rein may be forecasting the day when we shall simply make a diagnosis of syphilis and disregard stages except for infectiousness. Dr. Schoch's comments were very apropos. We are envious of him, having five serologic tests at his command. We do a routine Hinton and when that is positive always do a Wassermann; when there is a question we get as many checks as possible in another laboratory. While we don't think that some of our conclusions are far fetched on a few tests, they certainly could be improved if we had more. I should like to quote a few figures, as yet unpublished, from the last Serologic Congress. The Hinton test was done by five laboratories and there was not a single false positive or false doubtful from any of the five laboratories. There was no other test showing a complete absence of false positives. The Hinton test was 83.9 per cent sensitive on known positive specimens. The Kline exclusion test was close to that and the other five tests submitted to that congress were grouped in the 70's of percentage.

ACUTE PERFORATIVE DIVERTICULITIS OF THE COLON IN YOUNG PERSONS

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BOSTON

Based on reports of unselected postmortem examination¹ and on x-ray studies of the gastrointestinal tract of patients with abdominal symptoms,² the incidence of diverticulosis of the colon averages about 5.9 per cent. The average incidence under the age of 30 years is about 0.31 per cent of all diverticulosis patients;³ therefore, the frequency of diverticulosis in persons under 30 years of age would be about 18 per hundred thousand of population.

In an average of about 15 per cent of patients with diverticulosis diverticulitis develops,⁴ and approximately 21 per cent of these require surgical intervention,⁵ or about 3 per cent of diverticulosis patients. For the entire population the incidence of operation would be about 186 cases per hundred thousand of population, and for persons under 30 years of age, diverticulitis requiring operation would occur in no more than 5.7 patients in 1,000,000 of population.

It is possible, however, that diverticulosis and diverticulitis occur more frequently in young adults than has been indicated by these reports. Postmortem studies do not portray the true incidence of diverticulosis in young persons, since there is only an approximate mortality of 0.4 per cent of the population who are under 30 years of age.⁶ Likewise, the facts obtained from x-ray studies of the gastrointestinal tract are open to criticism. The average age of patients who have x-ray examinations made of the gastrointestinal tract has been given as 45 years.^{2c} Diverticula may not be visible unless special efforts are made to demonstrate them, and repeated x-ray examinations of the gastrointestinal tract may be necessary. To ascertain the approximately correct incidence of diverticulosis in persons under 30 it would be necessary to have x-ray studies of the gastrointestinal tract made for diverticula of all persons during their first three decades of life.

Furthermore, Judd and Pollock⁷ reported that of 118 operations for diverticulitis two, or 1.7 per cent, were performed on patients under 30 years of age. Also, in the course of my own private practice I have operated on three young adults for perforated diverticulitis with abscess, two of these patients being operated on within a period of two years.

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8. Judd, E. S., and Pollock, L. W.: Diverticulitis of the Colon, *Ann. Surg.* 80: 425 (Sept.) 1924.

REPORT OF CASES

CASE 1.—Mrs. J. P., aged 30, a housewife, admitted Jan. 21, 1925, had been taken ill five days previously with vomiting and constant abdominal pain, which was localized to the left lower quadrant. The patient was rather short and obese. The temperature was 102 F. There was considerable tenderness but no spasm in the left lower quadrant of the abdomen; no masses could be felt. Directions were given regarding the nonsurgical management of acute diverticulitis of the colon. Three days later the temperature was 102 F. and the pulse rate 120. An exquisitely tender mass the size of a large grapefruit was palpated for the first time in the left lower quadrant of the abdomen.

Operation was done the following morning. The mass consisted of omentum, adherent to the sigmoid, which was greatly thickened, particularly on the mesenteric border, and was covered with much fibrin. Associated with the mass was an abscess cavity containing about 8 ounces (240 cc.) of foul smelling pus. This was aspirated, and drainage was instituted. The patient made a satisfactory convalescence and was discharged from the hospital thirty days after operation. Gastrointestinal roentgenograms three and one-half months after the operation showed a diverticulum of the sigmoid.

CASE 2.—J. M., a man aged 23, admitted June 12, 1936, complained of intermittent abdominal pain of three weeks' duration which came on suddenly in the region of the umbilicus. He complained of diarrhea and vomiting on the day of the consultation as well as the day before. X-ray studies of the gastrointestinal tract showed moderate dilatation of several loops of small intestine; no diverticula of the colon were visible but the pattern of the mucosa seemed to be accentuated. A barium sulfate enema had been given and fluoroscopic examination showed tenderness at the junction of the descending colon and sigmoid. The patient was well developed and well nourished. The temperature was 99.6 F. Examination of the abdomen revealed exquisite tenderness and resistance at the left lower quadrant. Rectal examination disclosed a mass that could just be reached by the examining finger.

At operation a moderate amount of straw-colored fluid was found in the peritoneal cavity. The descending colon was adherent to the lateral parietal peritoneum, where there was a mass the size of a baseball. Within this mass was an abscess cavity from which about 4 ounces (120 cc.) of foul smelling pus was aspirated. A cigaret wick was placed into the cavity. The convalescence was fairly uneventful and the patient left the hospital on the thirty-seventh postoperative day. Roentgenograms of the gastrointestinal tract six months after the operation showed a diverticulum of the descending colon.

CASE 3.—Miss E. G., aged 19, a bookkeeper, admitted March 26, 1937, complained chiefly of abdominal pain, which after onset four days previously had localized to the right lower quadrant. Two days before admission she had an evening temperature of 101 F. There was no nausea and no vomiting. The patient was well developed and well nourished. The temperature was 100.5 F. Examination of the abdomen revealed tenderness, resistance and an indefinite fulness to the right of the umbilicus. Rectal examination was negative.

Operation revealed a mass the size of a tennis ball in the region of the ascending colon. Within the mass was an abscess cavity from which about 1 ounce (30 cc.) of thick, foul smelling pus was aspirated. A cigaret wick was placed into the cavity. The convalescence was relatively uneventful, and the patient was discharged from the hospital three weeks later. Roentgenograms of the gastrointestinal tract ten months after the operation showed a diverticulum of the ascending colon.

COMMENT

The causation of diverticulosis is still obscure. Although various explanations have been offered for the development of diverticulosis, such as old age, constipation with increased gaseous pressure within the colon, excessive fat or emaciation, and even a disturbance of the sympathetic nerves of the colon,^{2a} it

seems that the most applicable cause in young persons is an inherent weakness in the structure of the colon, which is usually at the point of entrance or exit of the blood vessels.⁸ The possibility of diverticula being congenital should also be considered, since cases have been reported in children and even in infants.⁹

In young adults, as in older patients, diverticula rarely give rise to symptoms until there are inflammatory changes. These changes may be brought about by trauma,¹⁰ such as repeated straining at stool, enemas given at high pressure, the use of drastic cathartics, and strenuous exercise. Food may also be a factor in causing diverticulitis;^{2a} red meats, for instance, may increase the bacterial activity within the intestine, and potatoes and milk may cause irritation by forming a relatively large mass. The possibility of an infection from a distant focus¹¹ should also be considered.

In diverticulitis the symptoms may closely resemble those of acute appendicitis. Pain, the outstanding symptom, may vary in intensity and may be intermittent or constant. Nausea and vomiting may be present. There is always localized abdominal tenderness and at times rigidity as well as distention. The temperature is usually elevated and there is an accompanying leukocytosis.

When diverticulitis involves the ascending colon, as in case 3, the diagnosis may be confused with an appendical abscess until the abdomen is opened. If, however, the lesion is on the left side a correct pre-operative diagnosis is frequently made. At times an abscess associated with diverticulitis can be felt by rectum. Fluoroscopic and sigmoidoscopic examinations may be of help in making an accurate diagnosis but are not without risk; if too vigorous, rupture of the abscess may result.

In early diverticulitis, that is, before perforation and abscess formation, inflammation may subside under nonsurgical management. This treatment should consist of rest in bed, practically nothing by mouth for a day or two, and ice bags or heat to the seat of pain. The heat may include short wave diathermy, electric pads, hot packs, Elliott treatment or rectal irrigation of warm physiologic solution of sodium chloride or olive oil. After the inflammation begins to subside, olive oil (2 or 3 ounces) or liquid petrolatum may be given by mouth, and later food, the diet at first being practically free of residue. Subsequently the patient should be put on an anticonstipation diet and given oil or agar by mouth.

If an abscess is present when the patient is first seen, as in the cases reported, or if in spite of medical treatment perforation and abscess formation take place, operation for the drainage of the abscess is indicated. If obstruction is present, cecostomy should also be done and, if the obstruction persists after the acute inflammation has subsided, resection of the obstructed area may be necessary.

Following recovery from an operation for perforated diverticulitis, the patient should be advised that

8. Hansemann and Klebs, cited by Judd and Pollock⁷ and by David.^{2b} Rankin and Brown.^{1b} Judd and Pollock.⁷ David.^{2b}

9. Hartwell, J. A., and Cecil, R. L.: Intestinal Diverticula, *Am. J. M. Sc.* 140:174, 1910. Ashhurst, A. P. C.: Sigmoid Diverticulitis (Mesosigmoiditis) in a Child, *Ann. Surg.* 47:300, 1908. Ransohoff, J.: Acute Perforating Sigmoiditis in Children, *Ann. Surg.* 58:218, 1913. Goebel, cited by Ransohoff. Erdmann, J. F.: Acute Diverticulitis of the Colon, *New York State J. Med.* 109:969 (June 7) 1919. Judd and Pollock.⁷

10. Telling, W. H.: Acquired Diverticula of the Sigmoid Flexure, *Lancet* 1:843, 1908; Multiple Diverticula of the Sigmoid Flexure, *Brit. M. J.* 2:1346, 1908.

11. Rogers, J. T.: Diverticulitis of the Colon, *Minnesota Med.* 6:35 (Jan.) 1923. Spriggs and Marxer.^{2c}

diverticulosis is still present. In order to avoid further development of diverticula or a recurrent diverticulitis, large doses of kaolin,¹² bismuth subnitrate or barium sulfate¹² once or twice a week may be helpful. Particular attention should be given to regularity at stool; agar may be taken for bulk and soft stools.^{3a} An effort should be made to improve the intestinal flora.^{2b} It would be well for the patient to exclude from the diet coarse and indigestible foods and to include cooked fruits and finely chopped vegetables.^{3a}

SUMMARY

1. Diverticulosis and diverticulitis of the colon probably occur more frequently in young persons than reports would indicate.

2. In this report young adults required operation for perforated diverticulitis of the colon with abscess.

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EPIDEMIC ENCEPHALITIS IN
NORTH DAKOTA

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During July, August, September and October 1938 an epidemic of acute encephalitis, which clinically resembled the St. Louis type, was observed in North Dakota. According to information supplied by Dr. John Cowan, of the North Dakota Department of Health, 101 instances were reported, of which fifty-two occurred in Minot and the surrounding rural territory, which includes the ten counties in the northwestern portion of the state. Twenty-three of these patients were cared for in Trinity Hospital by the members of the medical staff, and the material of this report was obtained from their clinical records. Nine entered the hospital from Minot, while fourteen came from farm homes located within a radius of 65 miles of the city. The rural patients lived from 10 to 120 miles apart, and in only two instances did more than one patient come from any single locality.

Nineteen patients were adults and four were children. Arranged according to age groups, the incidence among adults was evenly distributed from 20 to 70 years. Nine of the adults were men and ten were women. The four children ranged from 2 months to 8 years in age. Two were boys and two were girls. Most of the city patients were engaged in business or professional pursuits, and one was a nurse who had cared for patients ill with encephalitis. The severity of the symptoms was not related to age and was just as marked in the younger as in the older patients. Five died of the illness and were respectively 25, 26, 36, 57 and 60 years of age.

The illness was characterized by an acute onset with generalized severe headache and fever. The temperature when first taken at home ranged from 101 to 105 F., the average being about 102 F. The commonly used analgesics gave no relief from headache. The patients complained of severe generalized muscular pains and backache. Chills and chilly sensations

occurred when the temperature elevation was marked. Nausea and vomiting occurred in about one half of the patients early in the illness. Dizziness and drowsiness appeared within the first three days, but in spite of the drowsiness the patients were unable to sleep. After the fourth day, coarse or fine muscular tremors of the arms and face were present in about three fourths of the adult patients. The tremors were of the intention type and were absent at rest.

The symptoms of individual patients varied considerably. One became comatose on the first day of the illness while the mental symptoms of ten others did not progress to a state of delirium. Eight of the adult patients became irrational and delirious on the fourth or fifth day, and this condition was followed by coma within two days of all but one of these patients. For a time they could be aroused momentarily to take food, but later coma became deeper and incontinence of urine and feces occurred. Coma was a grave prognostic sign and five of the eight comatose patients died, four within two days after the onset of coma and one after eleven days. Two of the five had repeated convulsions before death and one had a right hemiplegia which could not be explained by cerebral hemorrhage or thrombosis at the postmortem examination. A third patient died of paralysis of the respiratory center, the respirations gradually slowing to 4 or 5 a minute. In only one instance was there a terminal bronchopneumonia.

In the children the onset was sudden with high fever. Vomiting, nervous irritability and convulsions were the most frequent symptoms, while coma of only one patient occurred. Spasmodic muscular contractions of the right arm and leg of one infant were noted. Recovery of children was rapid, and the course of the illness was several days shorter than that of adults.

Most of the patients had been ill three or four days before admission to the hospital. Physical examination disclosed no constant changes in the heart, lungs or abdomen. Rigidity of the neck, the most characteristic physical finding, appeared early in the illness and was present in fifteen cases. This sign was elicited by any passive effort to bring the head forward on the chest. Coarse intention tremors of the hands and face, particularly of the lips, were observed in all but seven cases, and in four there was slurred speech, apparently related to the tremor of the lips and tongue. The abdominal reflexes were absent in ten instances and later became absent in two more. The Kernig sign was positive in six of the cases in which there was rigidity of the neck. The Babinski reflexes were positive in only four cases and varied from time to time. There were no characteristic abnormalities of the patellar and achilles tendon reflexes. Lateral nystagmus was present in two cases, and in two others a fixation nystagmus was demonstrated. In one of the latter there was a transient divergent squint.

The temperatures on admission to the hospital ranged from 100.6 to 105.6 F., most of them being between 102 and 104 F. In those cases in which recovery occurred the temperature remained elevated from three to seven days after the onset and then subsided to normal within two or three days. The average duration of fever was about eight days. The pulse and respiratory rates were increased proportionately to the temperature.

Recovery from delirium, somnolence, muscular tremor and rigidity of the neck were complete within

12. Friedenwald, J., in discussion on Lynch, J. M.: Diverticula and Diverticulitis, J. A. M. A. 98: 793 (March 19) 1932.
From the Medical Service and Laboratory of Trinity Hospital and the Northwest Clinic.

one week after the temperature became normal. In one instance muscular tremor persisted for about six weeks. The average duration of the illness before convalescence was well established was fifteen days.

LABORATORY EXAMINATIONS

The average white blood cell count was 12,200, the lowest being 5,200 and the highest 22,700. The differential blood counts disclosed no constant change.

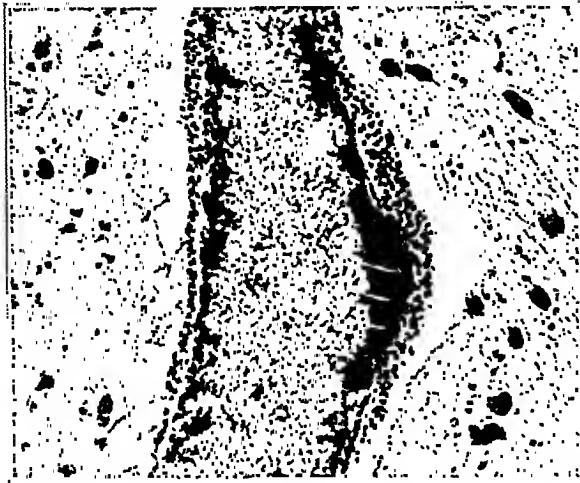


Fig. 1.—High power microscopic field demonstrating perivascular round cell infiltration.

Examination of the urine revealed albuminuria in eleven instances, the amount varying from 10 to 800 mg. per hundred cubic centimeters, but in most cases it was not more than 50 mg. per hundred cubic centimeters. Two patients showed traces of dextrose in the urine, and a third showed a large amount of dextrose with acetone and diacetic acid. This patient's blood sugar was 240 mg. per hundred cubic centimeters and death occurred on the ninth day of illness, although hyperglycemia and glycosuria were controlled by insulin.

In one fatal instance, the blood culture was repeatedly positive for the hemolytic streptococcus, and in four cases in which typhoid was suspected the Widal test was negative.

The average white cell count of the spinal fluid was 130, and it varied from 2 to 525 cells in individual instances. In adults about 80 per cent of the cells were lymphocytes and the rest polymorphonuclear leukocytes, while in children about 50 per cent of the cells were polymorphonuclear leukocytes. The spinal fluid sugar content, not including that of the diabetic patient, ranged from 45 to 104 mg. per hundred cubic centimeters, the average concentration being 72 mg. per hundred cubic centimeters. The cerebrospinal fluid pressure with the patient lying on the side ranged from 100 to 230 mm. of spinal fluid. The Nonne test was faintly positive in seven cases, and Lange's colloidal gold test was negative in five. The spinal fluid was cultured in seven instances and found sterile.

PATHOLOGY

Postmortem examination was performed on all five patients who died. The characteristic pathologic changes were limited to the central nervous system, and examination of the thoracic and abdominal tissues disclosed only such changes as might have been found in any severe toxic illness. When the dura was reflected from the brains a marked hyperemia of the leptomeninges was the most noteworthy change. There was

some flattening of the cerebral convolutions and narrowing of the sulci, and on surfaces made by cutting, the tissue of the brains was pink.

Histologically the leptomeninges were diffusely infiltrated with lymphocytes, although plasma cells and epithelioid cells were occasionally seen. The infiltration was most marked over the base of the brain, while over the vertex the cellular exudate was most abundant opposite the cerebral sulci. The small blood vessels of the brain and of the leptomeninges were widely distended with erythrocytes. Thrombi were found in a few small arteries in the basal ganglions of one brain and were associated with small recent hemorrhages in the surrounding tissue.

The most striking microscopic change was a marked perivascular round cell infiltration. This occurred in all parts of the brain but was less marked in the cerebral cortex and medulla than in the basal ganglions, pons and medulla oblongata. Occasional lesions were found in the cerebellum. The round cell exudates occupied the so-called Virchow-Robin spaces and only rarely were round cells found between the blood vessels and the brain substance. The cells were chiefly lymphocytes but plasma cells, epithelioid cells and polymorphonuclear leukocytes were occasionally identified.

A second characteristic change consisted of aggregates of mononuclear cells widely distributed in the gray and white matter of the brain. These lesions varied in size but ordinarily were not more than 250 microns in the greatest diameter. The mononuclear cells were apparently of glial origin. Their nuclei were rather large, round or oval, and often indented. The cytoplasm was scanty, irregular in outline and poorly defined. In the larger cell aggregates occasional lymphocytes were identified. The cell masses were not related to the vascular lesions and occurred independently of them.

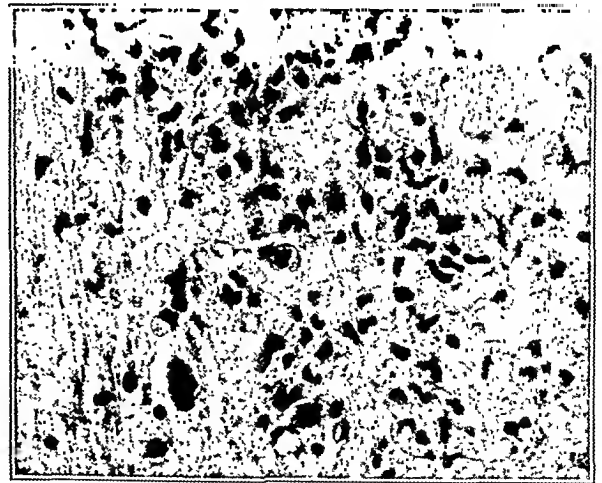


Fig. 2.—High power microscopic field from region of glial proliferation.

phocytes were identified. The cell masses were not related to the vascular lesions and occurred independently of them.

In all five brains degenerative changes of the large nerve cells were observed in the basal ganglions and pons, medulla oblongata and occasionally the cerebral cortex. The changes consisted of swelling and rounding off of the cell bodies with disappearance of the Nissl granules. The nuclei of these cells stained more deeply than normal, and the nuclear outlines were indistinct. In some no nuclear substance was visible and the rounded or irregular cell remnants were stained deep pink in hematoxylin and eosin preparations. Such cell

remnants were most frequently found in or near the regions of glial cell proliferation but were also found in the more normal tissue.

An unusual feature of the histologic preparations from the basal ganglions, pons and medulla oblongata was the presence of foci of demyelination in which the normal brain tissue was replaced by a pale staining spongy fibrillar mass. These lesions were no larger than a miliary tubercle. Many of them were densely infiltrated with mononuclear cells similar to those found in the regions of glial proliferation, but it was not unusual to find foci containing almost no mononuclear cells. The lesions were irregularly distributed in the tissue. Some were arranged along the course of the blood vessels, but others occurred as isolated lesions unrelated to the blood vessels. Foci of demyelination were not observed in the medulla or cortex of the cerebrum or cerebellum. The lesions were found in all five brains but the frequency with which they occurred varied considerably. They were numerous in three, while in the other two many microscopic sections were carefully examined before the lesions were demonstrated.

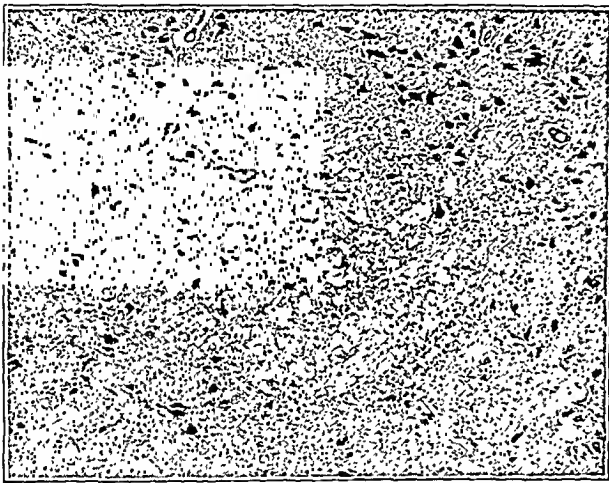


Fig. 3.—Low power microscopic field from lentiform nucleus, demonstrating region of demyelination.

In three brains marked glial proliferation, perivascular round cell infiltration and degenerative changes in the nerve cells were noted in the olfactory bulbs.

Serums from six patients who recovered were examined in two laboratories. Dr. Edwin H. Lennette, of the Department of Pathology of Washington University School of Medicine, St. Louis, reported that four of the serums failed to neutralize the virus of Western equine encephalomyelitis or of lymphocytic choriomeningitis. Three of the four failed to neutralize the St. Louis encephalitis virus, while the fourth on repeated tests gave equivocal results.

Serums from the same four patients in addition to two others were examined in the laboratories of the National Institute of Health, of the U. S. Public Health Service in Washington, D. C., and Dr. Charles Armstrong was kind enough to report that in only one instance were neutralization tests with St. Louis encephalitis virus strongly positive. This serum was from the same patient in whom equivocal results had earlier been obtained by Dr. Lennette. Serum from four of these six patients was found to contain neutralizing antibodies against the Western virus of equine encephalomyelitis.

COMMENT

Acute epidemic encephalitis, as it was observed in North Dakota in the summer of 1938, resembled that reported in the St. Louis region in 1933.¹ The symptoms, physical manifestations and clinical course were similar. The seasonal incidence and the distribution of the cases in the community were much the same.²

The pathologic changes in the central nervous system, however, differed from those occurring in the St. Louis patients³ in that small regions of demyelination were found in the basal ganglions, pons and medulla oblongata. Because of the difference in the pathologic condition it was suspected that the illness in North Dakota patients might be caused by a virus different from that responsible for the St. Louis epidemic. As already stated, the serum from only one of six patients who recovered neutralized St. Louis encephalitis virus.

In view of the fact that encephalitis in human beings has been reported as caused by the virus of both Eastern and Western equine encephalomyelitis,⁴ it is interesting to note that Western equine encephalomyelitis was prevalent in North Dakota in the summer of 1938. Serums from six of our patients who recovered were tested against the Western virus of equine encephalomyelitis, and Dr. Armstrong reported that the neutralizing antibodies were moderately positive in two instances and positive in two others.

The mortality in our series of patients was about 22 per cent. This figure is probably too high, since only seriously ill patients were brought to the hospital. The incidence of less severe acute encephalitis in the community could not be determined. The increased severity in the older age groups noted in St. Louis was not apparent in our patients.

In children the illness was first thought to be acute anterior poliomyelitis without paralysis, but later, because of the marked similarity of the clinical course to that in adults, the diagnosis was changed to acute encephalitis. Since all the children recovered, the pathologic changes could not be investigated.

SUMMARY

Twenty-three instances of acute epidemic encephalitis not previously observed occurred in North Dakota.

Clinically the illness resembled the St. Louis type of acute encephalitis.

Pathologically the North Dakota encephalitis differed from the St. Louis type in that foci of demyelination occurred in the basal ganglions, pons and medulla oblongata.

Serum from only one of six patients who recovered neutralized the virus of St. Louis encephalitis, while serum from four of these six patients neutralized the Western equine encephalomyelitis virus. The virus of lymphocytic choriomeningitis was not neutralized by serum from these six patients.

The mortality in the reported series was 22 per cent.

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DESOXYCORTICOSTERONE ESTERS

CERTAIN EFFECTS IN THE TREATMENT OF
ADDISON'S DISEASE

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During the past decade there have been two material advances in the treatment of patients suffering from Addison's disease. The first of these was the recognition of the abnormalities of electrolyte metabolism present in addisonian patients and the correction of these disturbances primarily through the addition of large amounts of sodium salts to the diet¹ and also through a reduction in the intake of potassium.² The second advance came through the elaboration of extracts of the adrenal cortex,³ which are life sustaining, at least in adrenalectomized animals.

Despite the progress made through these contributions, the treatment of Addison's disease has continued to be only moderately satisfactory at best. In the past three years the isolation of a series of crystalline steroids of great physiologic activity from adrenal cortical material has been accomplished by Kendall,⁴ by Wintersteiner and Pfiffner⁵ and by Reichstein.⁶ This work aroused the anticipation that one of these active steroids might be synthesized in sufficient amounts to make possible the treatment of adrenal insufficiency in man. This hope has been realized in the synthetic preparation of esters of desoxycorticosterone by Reichstein,⁷ and the present report deals with the results obtained following their use in a series of thirteen patients with Addison's disease. These results are in general agreement with those reported by Thorn⁸ and his associates and by Cleghorn and his colleagues.⁹

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Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL by the omission of ten case reports. The complete article appears in the authors' reprints.

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9. Read before the American Society for Clinical Investigation, May 1, 1939.

EXPERIMENTAL

Observations were made of the effects of desoxycorticosterone esters¹⁰ on various blood constituents including sodium, potassium, calcium, chloride, bicarbonate, nonprotein nitrogen, serum proteins, sugar and cholesterol. The effects on the excretion of water, sodium, potassium, total nitrogen and riboflavin were studied, and observations were made on changes in hematocrit, serum volume as measured with the blue dye method of Gregersen and Gibson, and total interstitial fluid volume as determined by the sodium thio-cyanate method. Finally, in a number of instances the effects of desoxycorticosterone on the basal metabolic rate and carbohydrate metabolism were recorded.

In this study, six patients were placed on standard regimens in the metabolism service. Their diets were essentially constant as to the types and amounts of the various foodstuffs, caloric values and mineral content. These patients also received a constant fluid intake and

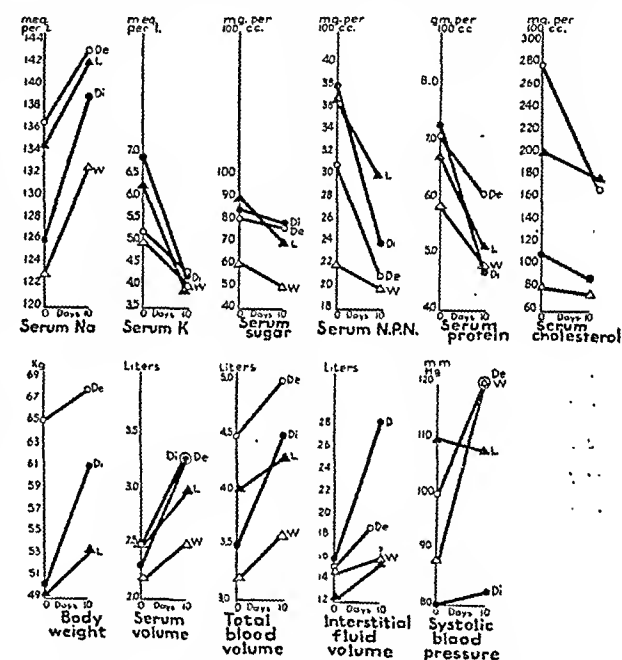


Fig. 1.—Summary of certain effects of desoxycorticosterone propionate observed after ten days' treatment of a group of patients with Addison's disease maintained on a standard regimen.

were given in addition to their food, which was prepared "salt free," a constant intake of sodium chloride. In addition to these rigidly controlled cases, observations were made on other addisonian patients who were allowed to eat and drink as they desired.

After a foreperiod of varying duration, the hospitalized patients received, as a rule, 25 mg. of desoxycorticosterone acetate or propionate daily for four days and then from 10 to 25 mg. daily for five days more. (The hormone, dissolved in sesame oil, was injected subcutaneously or intramuscularly once a day and each cubic centimeter contained 5 mg.) After this time the patients were allowed to eat as they desired and the dose of synthetic hormone was continued at a maintenance level. We have failed to detect any definite difference in activity between the acetate or propionate esters of desoxycorticosterone. The details of treatment are presented in the individual case histories.

10. The desoxycorticosterone esters used in this work were furnished by Roche-Organon, Inc. The term "doca" is employed as a contraction of the full chemical name.

RESULTS

The results are shown in part in the table and in figure 1 and can be summarized as follows:

Salt and Water Retention.—Desoxycorticosterone esters cause a striking retention of salt and water. The rate of retention of the sodium ion usually exceeds that of water, so that as a rule the serum sodium concentration increases to normal and is maintained at a normal level as fluid retention continues. In case 4 (fig. 2) water appeared to be retained more rapidly at first than the sodium ion, resulting in an actual decrease in the sodium level of the blood for three days. Following this the concentration rose to normal despite further water retention. In case 6, of extensive tuberculosis, it was never possible to raise the sodium concentration above 132 milliequivalents per liter although the retention of water was sufficient to cause pulmonary

hours and the chloride excretion underwent a comparable change.

As a result of these changes there were marked increases in the extracellular fluid volume in the various cases as measured by the sodium thiocyanate method. These increases were in general agreement with the gains in body weight except in case 1, in which repeated observations suggested an increase in extracellular fluid volume of 8.0 liters but a gain of only 3.3 Kg. in body weight. This discrepancy is not at present explainable. The data for salt and water retention in this case indicate that the validity of the thiocyanate figure is questionable.

The blood serum volumes increased between 0.3 and 1.2 liters during the first ten days of treatment in the six cases in which these measurements were made. These increases are in close agreement with the

Summary of the Maximal Effects of the Administration of

Case	Age	Sex	Blood Pressure, Mm. Hg	Weight, Kg.	Edema	Interstitial Fluid Volume, Liters	Serum Volume, Liters	Hematocrit, per Cent	Red Blood Cells, Millions	Serum Protein, Grams per 100 Cc.	Serum Albumin, Grams per 100 Cc.	Serum Globulin, Grams per 100 Cc.	Venous Pressure, Mm. H ₂ O	Vital Capacity, Cc.	Circulation* Time, Sec.	Serum Sodium, mEq. per Liter
1. S. McD.	35	♂	90/52 142/86†	50.3 53.3	0 0	15.0 23.0	2.0 3.0	48.0 32.0	4.48 4.00	6.7 5.7	...	...	65 75	2,250 2,450	12 13	135.8 140.8
2. R. W.	47	♂	96/64 146/108	70.2 74.3	0 ±	20.5 22.3	3.4 4.6	42.0 29.0	5.10 3.90	6.7 5.2	...	...	55 55	2,250 2,850	23 16	134.4 139.1
3. M. D.	27	♂	78/50 96/64	50.1 64.4	0 ++++	15.9 28.3	2.3 3.3	36.0 27.0	4.71 2.88	7.2 4.7	4.4 2.8	2.8 1.9	80§ 158	4,250§ 1,250	..	126 136.6
4. F. D.	41	♂	96/58 120/85	63.8 75.1	0 ±	15.1 18.7	2.5 3.3	44.5 34.0	3.70 3.60	7.1 6.0	...	...	...	...	..	130.3 143.2
5. M. L.	50	♀	100/68 160/82	50.2 53.8	0 ++	12.0 15.6	2.5 3.0	42.0 29.0	3.85 3.73	6.0 5.1	...	...	...	...	..	133.0 142.2
6. H. W.	30	♂	80/52 120/84	...	0 ++++	14.7 15.7	2.2 2.5	31.0 28.0	3.80 3.36	6.5 4.7	3.0 2.5	2.0 2.2	75§ 140	000§ 600	..	122.4 132.1
7. M. C.	37	♀	100/70 118/80	45.4 50.7	0 0	...	...	...	...	6.2 5.7	4.2 4.3	2.0 1.4	...	...	..	137.7 141.2
8. A. W.	50	♂	100/60 104/65	55.4 59.5	0 +	...	...	...	4.48 3.42	6.5 5.0	4.8 3.5	2.0 1.5	...	3,000	..	141.1 143.4
9. H. B.	33	♂	100/72 106/70	60.8 62.1	0 0	...	...	...	4.84 4.70	7.0 5.9	...	...	...	...	..	...
10. A. G.	35	♂	105/65 132/90	51.1 55.5	0 ++	...	...	...	...	7.4 6.5	...	...	...	...	..	...
11. R. F.	33	♂	94/70 160/110	61.1 63.8	0 ++	...	...	...	...	7.0 6.0	...	...	...	...	..	143.5
12. G. B.	32	♀	82/60 132/88	50.1 54.0	0 ++	...	...	...	...	7.0 6.3	...	...	...	...	..	...
13. M. J.	43	♀	94/60 80/60	38.6 40.0	0 ++	...	...	...	...	6.8 6.2	...	...	...	...	..	...

* Circulation time with 0.5 Gm. of calcium gluconate.

† Figures in bold face type are following desoxycorticosterone propionate or acetate and represent maximal effects.

congestion, hydrothorax, generalized edema and a temporary elevation of venous pressure to 140 mm. of water.

The amount of salt and water retained varies greatly in different cases and cannot be correlated with the initial sodium or serum protein concentrations or with the initial plasma volumes. Patient 3 (fig. 3) gained 11 Kg. in ten days, during which time he received a total of 190 mg. of the hormone. In contrast, patient 1 gained but 2 Kg. in thirty days, during which time he received 725 mg. of hormone. Both of these patients received the same amounts of sodium and potassium salts in their diets.

Coincident with the retention of salt and water and gain in weight, there was in every case a considerable decrease in the urinary excretion of sodium, chloride and water. For example, in case 3 the urine output fell from an average of about 1,500 cc. daily to as little as 410 cc. during the period of administration of 15 mg. of hormone each day. The sodium excretion fell from the average control period level of 159 milliequivalents to as low a value as 28 milliequivalents in twenty-four

decreases in hematocrit and serum protein concentration and indicate that no significant change in red cell volume occurred.

No consistent alterations of albumin-globulin ratios occurred in the four cases in which this determination of the serum was made. These included the two cases in which the serum protein concentrations fell respectively from 7.3 to 4.7 and from 5.9 to 4.8 Gm. per hundred cubic centimeters.

Potassium Excretion.—Synthetic desoxycorticosterone esters cause a striking decrease in the concentration of potassium of the serum and frequently reduce it to abnormally low levels. Thus, in eight of nine cases the potassium concentration after treatment was lower than 4 milliequivalents per liter, the lower limit of our normal values. In no instance, however, did the potassium concentration fall below 2.9 milliequivalents per liter.

The urinary excretion of potassium increased on the first day of hormone injection in the six cases in which this was studied. Thereafter the potassium excretion was extremely variable. For example, in one case there

resulted an increase in excretion of potassium far in excess of that which could be accounted for by a decrease in concentration in the interstitial fluid and also greatly in excess of that which might have been liberated by cell breakdown as judged by a slight increase in excretion of nitrogen. In another case the excess potassium excreted could be entirely accounted for on the basis of that lost from the interstitial fluid alone. In a third case the excess excretion was even less than might have been anticipated from the decrease in serum potassium level.

Nitrogen Excretion.—The nonprotein nitrogen level of the serum decreases even when it is within normal limits at the beginning of treatment.

Total nitrogen excretion may not be affected, but as a rule there is a slight increase not exceeding 2 Gm. in the first two or three days of treatment.

respiratory quotients measured before and after two weeks of hormone treatment in this case were 0.85 and 0.78 respectively—a change of questionable significance. In another case two hypoglycemic episodes occurred during which the blood sugar levels were 40 and 38 mg. per hundred cubic centimeters. This patient had been receiving 10 mg. of desoxycorticosterone daily for more than two weeks. This dose was insufficient to raise the blood sodium level above 122 milliequivalents per liter, although it was enough to cause excessive fluid retention.

Blood Pressure.—The effect of desoxycorticosterone derivatives on blood pressure is undeniable, although it does not appear as promptly as do the effects on salt and water metabolism. In all of the thirteen cases the blood pressure reached normal levels in the course of two to four weeks and in three cases it has risen gradu-

Desoxycorticosterone Esters Observed in Patients with Addison's Disease

Serum Chloride, mEq. per Liter	Serum Carbon Dioxide Content, mEq. per Liter	Serum Potassium, mEq. per Liter	Serum Calcium, Mg. per 100 Cc.	Serum Non-protein Nitrogen, Mg. per 100 Cc.	Serum Dextrose, Mg. per 100 Cc.	Serum Cholesterol, Mg. per 100 Cc.	Basal Metabolic Rate, per Cent	Comment
92.5	27.6	5.0	10.0	29	72	172	-14	Gained only 3 Kg. in 3 weeks despite 25 mg. Docea† and 11.6 Gm. of salt daily
107.7	26.5	3.7	9.1	22	61	151	-17	
98.0	31.0	4.8	10.3	33	74	188	-8	Gained only 3 Kg. in 12 days despite 25 mg. Docea and 7.9 Gm. of salt daily
103.0	29.0	3.5	9.0	29	87	163	± 0	
100.0	20.3	7.7	10.1	41	78	134	....	Gained 11 Kg. in 10 days with about 20 mg. of Docea daily; gained 0.3 Kg. regularly with 5 mg. of Docea without salt added to diet
106.7	25.6	4.0	8.6	24	82	89	....	Gained 2.2 Kg. in 10 days on 20 mg. of Docea and 11.6 Gm. of salt daily
100.0	26.3	5.2	....	31	82	279	....
108.8	27.0	3.9	....	21	77	168	....
100.0	22.4	6.3	....	38	78	212	....	Gained 3.7 Kg. in 10 days on 20 mg. of Docea and 6.6 Gm. of salt daily
109.4	25	3.9	....	30	76	178	....
94.0	23	5.1	8.7	27	63	81	....	Died; marked hydrothorax and ascitic fluid; massive edema; extensive tuberculosis of adrenals, peritoneum and spine; had fever and ate poorly in last weeks
102.0	27.2	3.9	8.0	17	35	66	....
108.0	22.5	3.9	10.1	28	70	193	....	Gained 3 Kg. in the hospital on 12.5 mg. of Docea and 10 Gm. of salt daily; maintained in office on 15 mg. of Docea every two days and 5 Gm. of salt daily
113.0	25.7	3.6	8.9	23	71	165	....	In hospital, gained 4.5 Kg. in 10 days on 15 mg. of Docea and 10 Gm. of salt daily
106.0	25.6	4.7	10.0	25	55	143	....
112.0	26.6	3.7	9.0	22	88	140	....
101.0	....	....	....	30	63	....	....	Patient treated in clinic; gave himself 12.5 mg. Docea every other day; taking 2 teaspoonsful of salt daily
108.0	....	....	....	21	80	....	....
98.8	....	....	....	27	71	....	....	Patient given 15 mg. of Docea daily for 2 weeks and then 12.5 mg. every other day; taking 5 Gm. of salt daily
105.3	....	....	....	23	71	....	....
105.0	....	....	....	27	64	....	....	Patient treated in clinic; after 2 mo. on 15 mg. of Docea every other day and 10 Gm. of salt daily, he was admitted with marked congestive heart failure; died
109.0	....	2.9	....	22	83	....	....	Patient treated in clinic; getting 15 mg. of Docea every other day and 10 Gm. of salt daily; 6 wk. after start she died suddenly at home; death was unexplained
108.0	....	....	....	..	87	....	....	Treated at home with 15 mg. every 2 days and 8 Gm. of salt daily for 2 weeks; because of local reaction, Docea stopped for 2 weeks; last 3 weeks on 10 mg. of Docea every 2 days and 5 Gm. of salt daily
108.4	....	....	....	..	75	....	....
100.0	....	....	....	26	69	....	....
104.0	....	....	....	22	81	....	....

§ After return to normal.

† Docea = Desoxycorticosterone acetate or propionate (Roche-Organon).

In the two cases in which determinations were made it appears that ammonia excretion increases within twenty-four hours after desoxycorticosterone has been administered.

Blood Calcium and Cholesterol.—The serum calcium concentration decreases following administration of the hormone. This was observed to be true in each of six cases in which determinations were made before and ten days after the initiation of treatment. This change may be attributed to hemodilution with its attendant decrease in serum albumin concentration.

The cholesterol content of the blood also decreases, probably as a result of hemodilution.

Carbohydrate Metabolism.—No evidence has been found to suggest that desoxycorticosterone esters have any effect on carbohydrate metabolism. The fasting blood sugar level is often as low or even lower after from ten to forty days of treatment. In case 1, in which 25 mg. of hormone was administered daily for thirty days, the fasting blood sugar level was 74 mg. and four hours after the ingestion of 100 Gm. of dextrose it was 46 mg. per hundred cubic centimeters. The

ally to 160/92, 160/110 and 146/108 respectively. It does not seem likely on the basis of the history that any of these patients suffered from hypertensive vascular disease before the onset of Addison's disease.

Miscellaneous Effects.—In addition to the objective changes described, all of the patients feel stronger and their characteristic early morning asthenia and nausea disappeared during the course of treatment with the synthetic hormone. No definite effect on pigmentation has been noted beyond that attributed to rehydration and no change in riboflavin excretion has been observed.

Effect of Progesterone.—In view of recent observations on the similarity of action of progesterone and desoxycorticosterone¹¹ in animals, their relative effects were compared in three cases of Addison's disease. The results in two of these are shown in figures 3 and 4. It is clear that the daily subcutaneous administration of

11. Thorn, G. W., and Engel, L. L.: The Effect of Sex Hormones on the Renal Excretion of Electrolytes, *J. Exper. Med.* 68: 299 (Sept.) 1938. Gaunt, Robert; Nelson, W. O., and Loomis, Eleanor: Cortical Hormone-like Action of Progesterone and Nonspecific of Sex Hormones on "Water Intoxication," *Proc. Soc. Exper. Biol. & Med.* 39: 319 (Nov.) 1938. Greene, R. R.; Wells, J. A., and Ivy, A. C.: Progesterone Will Maintain Adrenalectomized Rats, *ibid.* 40: 83 (Jan.) 1939.

progesterone in doses of 30 mg. given for seven or eight days was entirely without either subjective or objective effect. Whether larger doses might have had some effect is not known.

COMPLICATIONS

In view of the high degree of physiologic activity of desoxycorticosterone esters, it could be expected that overdosage might result in the appearance of disturbing complications. Indeed, ten of thirteen patients developed edema varying from mild and transient puffiness of the face and ankles to massive anasarca. Patients 3, 6 and 11 developed respiratory distress, tightness in the chest, a rise in venous pressure and a decrease in vital capacity associated with x-ray evidence of pulmonary congestion, as shown in the table. Patient 3 also developed striking dilatation of the right side of the heart (fig. 5). In this patient the rapid increase in blood volume from 3.6 liters up to 4.5 liters was associated with the development of hypoproteinemia, circulatory

basis for the dilatation of the heart, although mild hypertrophy was present.

The mechanism for the development of cardiac insufficiency in these three cases is not clear. A rapid and extensive increase in circulating blood volume is a possible factor, although in case 6 the increase in blood volume caused by the hormone was only 300 cc. at the time when the venous pressure was elevated and symptoms were most marked. The possibility of vitamin B₁ deficiency as an etiologic factor has been considered but, with the exception of relatively low excretion of thiamin in the urine, we have no evidence to support this idea.

REPORT OF CASES

CASE 3.—History.—M. D., a man aged 27, unmarried, a soda clerk, whose history prior to the present illness contained no significant facts, for about ten years had tanned easily and noticed that the tan did not fade normally. One year before admission he consulted a physician because of weakness, anemia (hemoglobin 75 per cent, erythrocytes 3,700,000) and he improved following treatment. The present illness was finally precipitated by a reaction to tetanus antitoxin given for a hand injury; after considerable vomiting he received a saline infusion with spectacular benefit and the diagnosis of Addison's disease was made. In spite of the use of salt and small amounts of adrenal cortex extract he continued to fail and a perirectal abscess accelerated this trend. He lost 19 pounds (8.6 Kg.) in the four months before coming to the Presbyterian Hospital. On admission he was thin, markedly pigmented both in skin and mucous membranes, and obviously ill; the blood pressure was 80 systolic, 40 diastolic, and there was acrocyanosis and a fistula in ano. There was no evidence of tuberculosis. His sedimentation rate on admission was 68 mm. in one hour, but he was afebrile. The basal metabolism was —8 on February 27. Chemical studies on admission showed the serum sodium 126 milliequivalents per liter, potassium 7.7 milliequivalents per liter, blood sugar 78 mg. per hundred cubic centimeters and nonprotein nitrogen 41 mg. per hundred cubic centimeters.

This was a typical case of Addison's disease, probably due to atrophy of the adrenals and complicated by a rectal fistula.

Treatment with Desoxycorticosterone.—The patient was placed on a constant diet with measured and constant intake of sodium (12.3 Gm.), potassium and water. He was then given 30 mg. of progesterone daily intramuscularly for eight days and no demonstrable effect was noted on weight, blood pressure, excretion of urine chloride or in serum electrolytes. He was then given 25 mg. of desoxycorticosterone subcutaneously for four days. His weight increased 1.7 Kg., the urine volume was halved and there was no marked change in urinary nitrogen. Urine chloride excretion was decreased 30 per cent, sodium excretion 60 per cent, and urine potassium excretion was increased about 60 per cent. Serum cholesterol decreased from 112 to 102 mg. per hundred cubic centimeters, serum sodium rose from 126 to 132 milliequivalents per liter, chloride from 100 to 104 milliequivalents per liter, bicarbonate from 20 to 23 milliequivalents per liter, serum potassium fell from 6.9 to 4.3 milliequivalents per liter, protein 7.3 to 5.6 per hundred cubic centimeters, nonprotein nitrogen from 38 to 30 mg. per hundred cubic centimeters. The serum sugar was not changed. The extracellular fluid volume rose from 15.9 to 19.8 liters. The hematocrit reading fell from 34 to 27.5 per cent cells. The blood pressure was not altered. The patient was then given between 10 and 15 mg. of desoxycorticosterone subcutaneously daily for the next seven days and gained 9.1 Kg. more weight. At this time there was marked edema of the face, saerum and ankles. The venous pressure was elevated (158 mm. water), the vital capacity was lowered to 1,250 cc. and he had developed an acute dilatation of the right side of

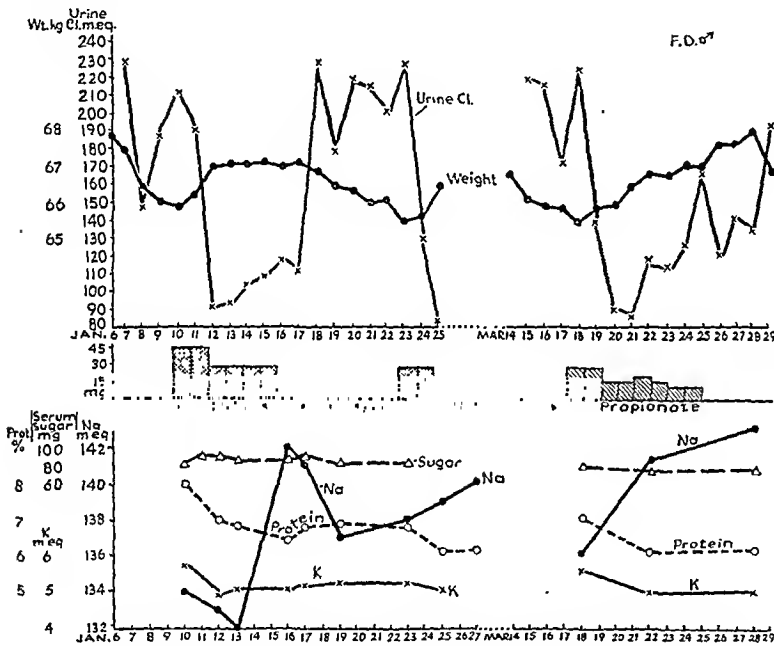


Fig. 2 (case 4).—Effects of desoxycorticosterone acetate and propionate.

embarrassment and edema. It was necessary to resort to the restriction of fluid and salt to do away with this "edema of adrenal origin." He improved promptly, and in the course of fourteen days his venous pressure dropped from 157 mm. to 80 mm. of water, his cardiac dilatation disappeared (fig. 6), his vital capacity rose from 1,250 cc. to 4,250 cc., and except for slight puffiness of his face and ankles his edema disappeared. It is of interest to note that after this improvement had taken place the circulating blood volume was still 4.5 liters.

In case 11, serious cardiac insufficiency associated with a rise in venous pressure to 250 mm. of water and a rise in arterial pressure to 160/110 mm. of mercury developed at a time when the patient was taking only 15 mg. of desoxycorticosterone every other day and from two to three teaspoonfuls of salt in his diet. The difference in the size of his heart before and after treatment may be seen in figures 7 and 8. Following phlebotomy and the limitation of salt and water the venous pressure fell but the patient succumbed with a terminal pneumonia. The details are described in the case record. Autopsy revealed no adequate organic

the heart (fig. 5). During this period the urine output was about one half of that in the foreperiod. The excretion of urine chloride varied but was usually below that of the foreperiod by about 45 per cent. Excretion of urine sodium was 30 per cent of that during the foreperiod and urinary potassium was about 20 per cent less than during the foreperiod. His serum sodium had risen to 138.6 milliequivalents per liter from 131.6, chloride to 107 milliequivalents per liter from 104, bicarbonate to 25.6 from 23.1 milliequivalents per liter. The serum potassium remained about the same after the first four days and at this time was 4.2 milliequivalents per liter. The serum

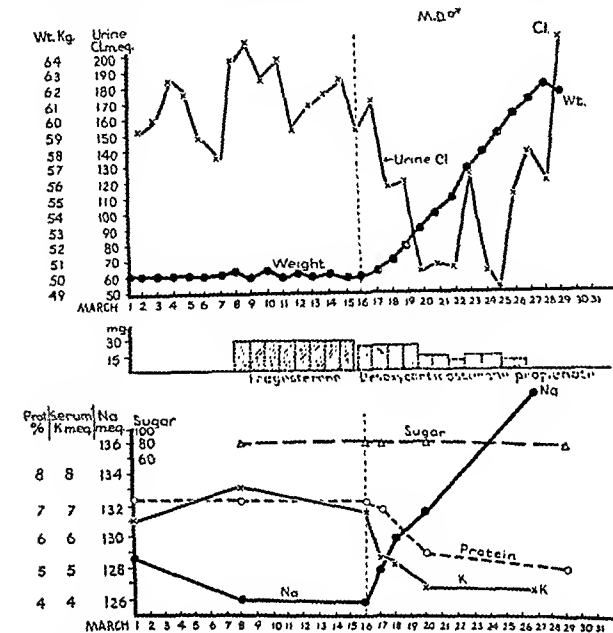


Fig. 3 (case 3).—Comparison of effects of progesterone and desoxycorticosterone propionate.

protein continued to fall from 5.6 to 4.7 per hundred cubic centimeters, the nonprotein nitrogen fell to 24 mg. per hundred cubic centimeters from 30, and the serum sugar continued to remain the same. The serum volume had risen to 3.3 liters from 2.3 liters at the start of the administration of desoxycorticosterone. The extracellular fluid volume had risen from 15.9 at the start to 28.3 liters. The blood pressure remained about the same. The serum cholesterol had fallen to 89 mg. per hundred cubic centimeters from 102. The restriction of salt and water for three days was necessary to stop progressive gain in edema and cardiac insufficiency. Thereafter the patient was on an unlimited diet and fluid intake. Salt was restricted somewhat and he was given 5 mg. of desoxycorticosterone every two to three days. He gradually lost his edema, his venous pressure and vital capacity returned to normal, his cardiac dilatation disappeared (fig. 6) and about six weeks after the first injection of desoxycorticosterone he had gained 14 Kg. and had no edema. His serum sodium remained about 135.5 milliequivalents per liter, potassium 4 milliequivalents per liter, the serum protein had risen to 6.6 per hundred cubic centimeters and the serum cholesterol to 134 mg. per hundred cubic centimeters. The extracellular fluid volume was 25.5 liters and the blood volume 4.6 liters as against 28.3 and 4.5 liters respectively at the height of his edema. At this time his blood pressure had risen about 15 mm. of mercury systolic but the diastolic had not changed and he still had a blood pressure consistently under 100. His general clinical status was as different from his original condition as possible and he felt perfectly well up and around. He was given a constant diet again for a six day period and given 25 mg. of desoxycorticosterone by mouth for three days. This was five times the amount needed to maintain him when given subcutaneously and had no effect on his chloride excretion or on his serum values. He lost weight and the serum potassium rose from 4.4 to 5.4 milliequivalents per liter on this regimen. He was returned to his former regimen of desoxycorticosterone 5 mg.

every two to three days and a regular diet with no added salt and had the fistula in ano repaired. He was under general anesthesia for an hour and withstood the operation uneventfully with only one saline infusion postoperatively. He is now still in the hospital, recovering from his operation, and two and one-half months after the start of desoxycorticosterone administration he has gained a total of 14 Kg. and has maintained his serum electrolyte values at nearly normal levels on 5 mg. of desoxycorticosterone every three days. More than this leads to edema. His blood pressure after ten weeks of desoxycorticosterone remains below 100. A dextrose tolerance curve done two months after the start showed a flat curve but no hypoglycemia four hours after ingestion of 100 Gm. of dextrose.

CASE 4.—History.—F. D., a man aged 41, married, an editor, had a nervous breakdown in 1920 and progressive leukoderma since 1921. In 1936 he noticed that his summer tan did not fade in the winter. Beginning in August 1937 he suffered from increasing weakness, anorexia and loss of weight (20 pounds, 9 Kg.) in all. On admission his blood pressure was 70 systolic, 60 diastolic, and his nonleukodermic skin was pigmented but there was no pigmentation of the mucous membranes. The blood count and urine were normal; the sedimentation rate was 20 mm. in one hour. Roentgenograms of the chest and adrenal areas were negative. The serum sodium was 127.7 milliequivalents per liter, potassium 5.6 milliequivalents per liter, the blood sugar 96 mg. per hundred cubic centimeters and the nonprotein nitrogen 47 mg. per hundred cubic centimeters.

On salt administration he improved greatly and the addition of cortical extract made little if any difference. He was followed in the hospital and clinic until Jan. 5, 1939, when he was readmitted for desoxycorticosterone administration. During this time he was able to work at intervals, his serum sodium remaining normal most of the time but his blood pressure usually being below 100 systolic.

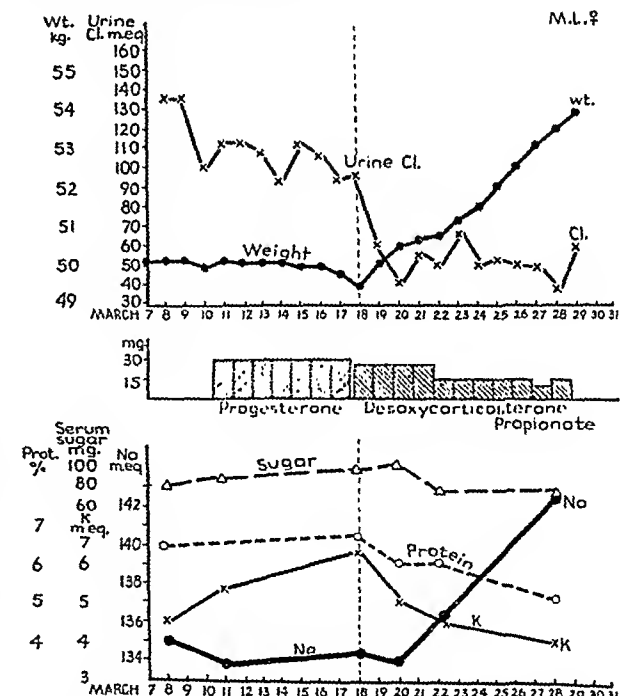


Fig. 4 (case 5).—Comparison of effects of progesterone and desoxycorticosterone propionate.

A man of 40 with Addison's disease greatly helped by salt administration but never returning to normal strength, his emotional make-up interfered with an accurate appraisal of his condition at times. There was no evidence of tuberculosis. Leukoderma was a coexisting condition.

Treatment with Desoxycorticosterone.—The patient was placed on a constant diet containing known amounts of sodium chloride (11.6 Gm.), potassium and water. He was then given 25 mg. of desoxycorticosterone intramuscularly daily for four days and gained 1 Kg. in weight. The urine volume was decreased by

about 10 per cent, the urine chloride by 50 per cent, the urine sodium by 70 per cent. The urine nitrogen was increased by about 10 per cent and the potassium by about 50 per cent. The serum sodium rose from 136.3 to 141.6 milliequivalents per liter, chloride from 100 to 104.8 milliequivalents per liter, bicarbonate from 26.3 to 26.7 milliequivalents per liter. The serum potassium was decreased from 5.2 to 4.4 milliequivalents per liter, the protein from 7.1 to 5.9 per cent, the cholesterol from 279 to 192 mg. per hundred cubic centimeters, the nonprotein

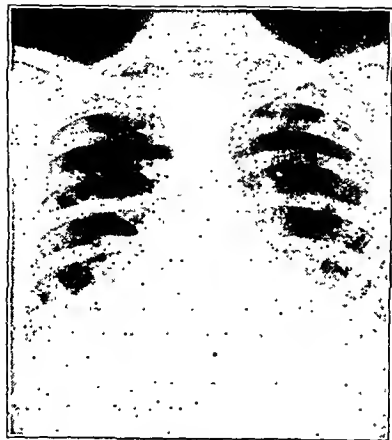


Fig. 5 (case 3).—Pulmonary congestion and dilatation of the right side of the heart associated with a gain of 11 Kg. during ten days' treatment with desoxycorticosterone propionate.

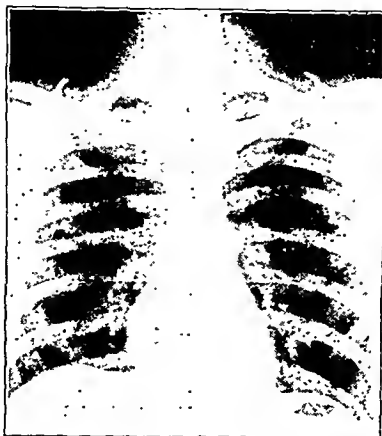


Fig. 6 (case 3).—Disappearance of pulmonary congestion and dilatation of the heart two weeks after the cessation of desoxycorticosterone propionate injections and the limitation of salt and water in the diet.

nitrogen and sugar remained about the same and the hematocrit reading fell from 44.5 per cent to 37 per cent cells. Desoxycorticosterone was continued for six more days, from 10 to 15 mg. daily, and he gained another kilogram and had no rise in blood pressure. The urine volume remained about 10 per cent less than in the foreperiod, the nitrogen was 10 per cent less than in the foreperiod, the chloride was about 50 per cent of that of the foreperiod, the sodium about 50 per cent and the potassium excretion was increased about 25 per cent. The serum sodium continued elevated at 143.2, chloride at 108.8 milliequivalents per liter, bicarbonate at 27 milliequivalents per liter, nonprotein nitrogen fell from 32 to 21 mg. per hundred cubic centimeters and serum potassium, protein and sugar did not change during this additional six days on desoxycorticosterone. For the whole ten day period the extracellular fluid volume rose 2.3 liters and serum volume rose 800 cc. The hematocrit reading fell from 44.5 to 34 per cent cells. He was discharged to the clinic on 12.5 mg. of desoxycorticosterone given subcutaneously by himself daily with between 5 and 10 Gm. of sodium chloride added to the diet and has continued to gain weight. When last seen, two months after the start of desoxycorticosterone administration, he was feeling well, was gainfully employed and was maintaining a blood pressure of 120 systolic, 85 diastolic as well as a serum sodium of 140 and a potassium of 3.9 milliequivalents per liter. He never developed any peripheral edema but at times noted that his face was puffy.

CASE 11.—History.—R. F., a man aged 33, married, an elevator operator, began to notice weakness, anorexia and loss of weight (60 pounds, 27 Kg., in all) in the fall of 1937. Over about the same period "brown spots" appeared on his skin. Following tonsillectomy on May 21, 1938, he began to have nausea and vomiting and was admitted to Bellevue Hospital, where he remained three and one-half months with the diagnosis of Addison's disease. The serum sodium at this time was 115.9 milliequivalents per liter. He responded well to sodium chloride but implantation of an adrenal gland into the right rectus was ineffective.

Sept. 12, 1938, he began visiting the Vanderbilt Clinic. He presented the classic picture of weakness, pigmentation of the skin and mucous membranes and a blood pressure of 95 systolic, 70 diastolic. He had a mild secondary anemia, x-ray examination of his chest showed healed tuberculosis at the left apex, and his adrenal areas contained shadows of calcium density. The serum sodium was 141 milliequivalents per liter, potassium 4.5 milliequivalents per liter, sugar 83 mg. per hundred cubic centimeters and nonprotein nitrogen 22 mg. per hundred cubic centimeters. On approximately 15 Gm. of sodium chloride and a low potassium diet he improved greatly.

Jan. 2, 1939, he was admitted to the Presbyterian Hospital acutely ill with hemolytic streptococcus sore throat. The serum sodium was 132 milliequivalents per liter. Again on February 20 he came into the hospital with fever. This lasted for more than a week and was never satisfactorily explained. Roentgenograms of the spine showed a destruction of the intervertebral disks between the fourth and fifth dorsal vertebrae suggesting tuberculosis, probably inactive. He was discharged March 11 with a relatively normal temperature, a blood pressure of 90/60, sedimentation rate 78 mm. in one hour and a calculated serum sodium of 137 milliequivalents per liter. He returned to the Vanderbilt Clinic for Doca administration April 3.

A man of 33, with classic Addison's disease due to tuberculosis, he survived two febrile episodes by the use of sodium chloride. He had inactive pulmonary and spinal tuberculosis.

Treatment with Desoxycorticosterone.—The patient was treated in the clinic. He was on his usual diet at home with from two to three teaspoonfuls of salt added to the diet. During the first week of the administration of desoxycorticosterone (15 mg. every two days) he gained 1.5 Kg. in weight and his blood pressure rose from 95/70 to 120/75. Serum chloride showed no change, his serum protein fell from 7.0 to 6.8 per cent, and his blood sugar remained constant at 65 to 75 mg. per hundred cubic centimeters. He was taught to inject the desoxycorticosterone himself at home and after seven weeks of 15 mg.

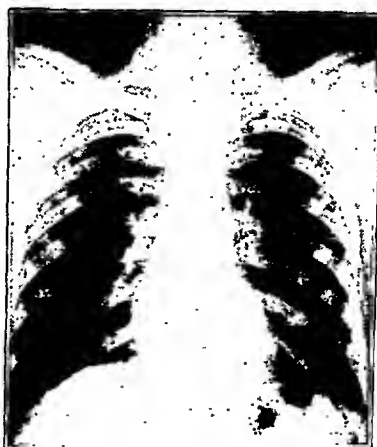


Fig. 7 (case 11).—Appearance of heart before treatment with desoxycorticosterone acetate.



Fig. 8 (case 11).—Appearance of heart after treatment with desoxycorticosterone acetate.

every other day he gained 2.6 Kg. and maintained his blood pressure at the normal level of 120/80. His serum protein had fallen to 6.4 per cent, nonprotein nitrogen from 27 to 22 mg. per hundred cubic centimeters and serum chloride remained the same, about 106 milliequivalents per liter. He felt much improved, developed a large appetite, and although he stated that his ankles had been swollen at night, this edema had never been observed in the clinic in the morning. Three weeks after his last clinic visit and approximately two months after he had begun to take desoxycorticosterone he was admitted to the ward

with a story of slowly increasing dyspnea for three weeks, severe enough in the past two weeks to confine him to his fifth floor room. This was accompanied by nonradiating squeezing, substernal pain. Two days before admission he had complained of nausea, vomiting and epigastric cramps. On examination he was dyspneic with slight cyanosis, and his face was puffy. Fine rales and dullness were present at the right base. The pulmonic second sound was greater than the aortic second sound. A tender liver was felt two fingerbreadths below the costal margin. There was no pitting edema. The temperature was 99.4, blood pressure 130/100, vital capacity 1,300 cc., venous pressure 140 mm. of water, rising to 200 following an infusion of 200 cc. of physiologic solution of sodium chloride. The circulation time was 64 seconds (calcium gluconate), serum sodium was 143.5 milliequivalents per liter, potassium 3.2 milliequivalents per liter, protein 6 per cent, sugar 80 mg. per hundred cubic centimeters. X-ray examination of the heart (fig. 8) showed marked increase in size both to the right and to the left, contrasting sharply with a normal cardiac contour shown on a roentgenogram taken four months earlier (fig. 7). An electrocardiogram showed little beyond the voltage lower than that of the record taken four months previously. The urine contained 3 plus albumin and no significant cells. Desoxycorticosterone and salt were withheld. On the day following admission, his blood pressure rose to 150/130 and because of increasing dyspnea and cyanosis together with a venous pressure of 250 mm. of water, he was digitalized parenterally, 400 cc. of blood was withdrawn by phlebotomy, and he was put in an oxygen tent. The following morning his temperature had risen to 103 F., venous pressure had fallen to 100 mm. of water and throughout the day his blood pressure fell from 130/80 to 60/40, responding only briefly to an infusion of 1,250 cc. of 5 per cent dextrose in saline solution. The heart sounds became poor, his pulse became irregular and he died the following morning after ten hours of coma with increasing tachypnea and irregular tachycardia. Postmortem examination revealed no gross cause for cardiac failure, although there was slight cardiac hypertrophy and marked dilatation. Only about 150 cc. of fluid was present in the pericardium, and a mild bronchopneumonia was also present. There was also advanced tuberculosis of both adrenal glands.

SUMMARY

1. The use of desoxycorticosterone esters in patients with Addison's disease produces striking clinical and physiologic effects.
2. Clinically there is unequivocal improvement far greater than has resulted from any therapy hitherto advocated.
3. The most striking physiologic effects are on salt and water metabolism. The administration of desoxycorticosterone esters causes retention of sodium and water. The result of this retention is an improvement in the patient's condition which is qualitatively identical with that following the administration of salt and water alone, but quantitatively it is far more marked.
4. No effect on carbohydrate metabolism has been observed.
5. Patients vary greatly in the amounts of desoxycorticosterone esters required to alleviate the manifestations of adrenal insufficiency.
6. Extreme caution must be exercised in the administration of desoxycorticosterone esters because excessive amounts may lead to the development of hypoproteinemia, marked edema and cardiac insufficiency.

ADDENDUM.—Since this article was written, it has been found that patients do most satisfactorily with small daily doses of synthetic hormone without the addition of salt beyond that of the usual diet. It may also be pointed out that patient 7 developed transient dilatation of the heart, relieved by the withdrawal of salt. Furthermore, patient 5 died suddenly at home while under treatment while the blood pressure was normal and without fever.

Clinical Notes, Suggestions and New Instruments

A DEVICE FOR TURNING THE FRAME PATIENT

HOMER STRYKER, M.D., ANN ARBOR, MICH.

Hospitals or physicians who use the anterior and posterior Bradford frames are confronted with the nursing problem of changing the patient from one frame to the other. A method which enables one nurse to turn any patient without lifting and with a minimum of discomfort to the patient is herein

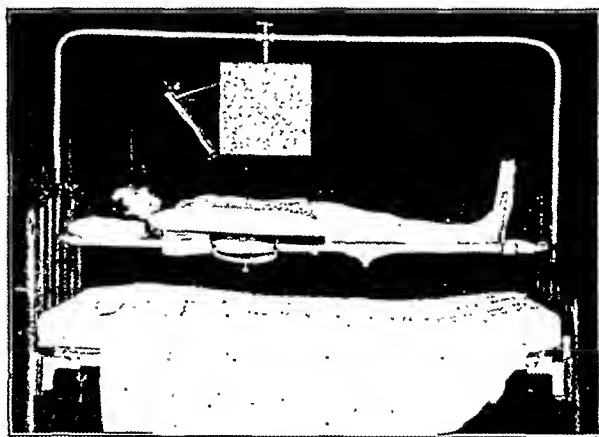


Fig. 1.—Patient on posterior Bradford frame with foot and arm supports attached. The frame is supported by the turning devices attached to the ends of the bed. These also support the overhead frame, from which is suspended a small cabinet the door of which serves as a reading board or, when lowered, a writing board.

described. It has been found satisfactory in the daily care of from fifteen to twenty such patients at the University Hospital. If a patient who requires frame care is allowed to remain a part of the day on his abdomen, he is more comfortable and is less liable to develop decubital ulcers or respiratory or renal complications.

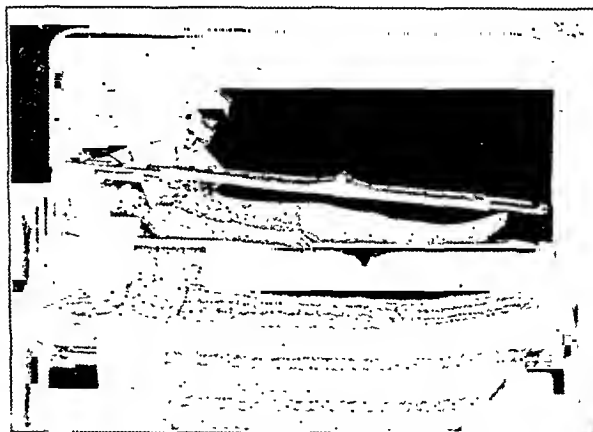


Fig. 2.—The nurse has removed the cabinet and the arm and foot supports and is placing the anterior frame down over the patient, where it is fastened by a wing nut at each end.

METHOD OF TURNING PATIENT

The patient is placed on his back on a posterior frame. This frame is then suspended about 1 foot from the mattress, each end being attached to a turning device which clamps on to the

From the Orthopedic Service of Dr. Carl E. Badgley.
From the Department of Surgery, University of Michigan Medical School.

head and foot of the bed. To turn the patient, the anterior frame is placed over him and pressed down firmly, pressing him between the two frames. The anterior frame is then locked in this position. The nurse then releases a spring lock at the end and revolves the two frames, with the patient between them, through an angle of 180 degrees, whereupon the frames automatically lock again, leaving the patient face downward on

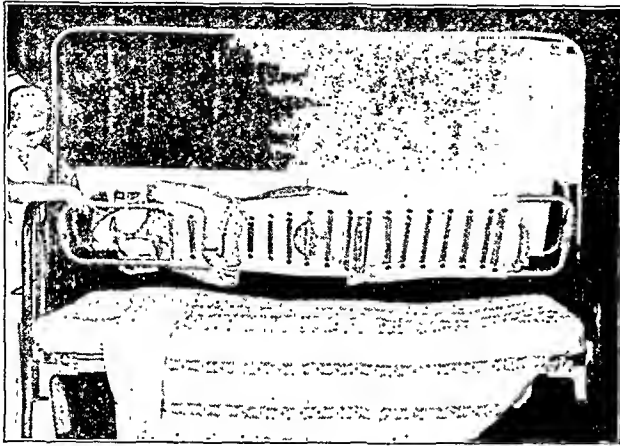


Fig. 3.—The nurse has released the lock and is turning the frames with the patient compressed between them. When face downward the frames automatically lock and the posterior frame is then released and lifted off. The face support and rubber bands which hold the canvas taut are shown in this view.

the anterior frame. Since the patient simply revolves on his long axis without change of the center of gravity, little effort is required for the turning. The upper frame (posterior) is now released and lifted off.

While on the anterior frame, the head is supported by an adjustable face piece which lies on the anterior frame and takes the weight on the cheeks and forehead. It is padded with sponge rubber and has flannel covers which may be removed

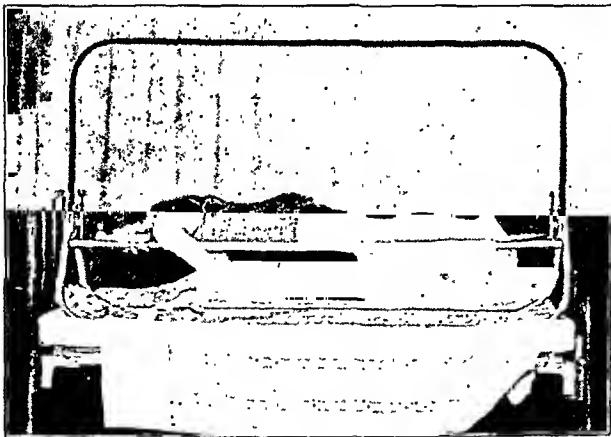


Fig. 4.—Patient on anterior frame. This is the portable unit in which the turning devices, instead of clamping on the bed ends, are supported by a base which sets on the bed. It may be transported as a unit and rests on any level surface.

for washing. The eyes are about 15 inches from the mattress, a comfortable distance for reading and writing. The anterior frame is narrowed at the shoulders to allow the arms to be brought down over the sides for comfort. In some cases frequent turning may be required, but usually the patient remains on the anterior frame during the day. At night the patient is turned in the same manner to the posterior frame.

TYPE OF FRAMES

By means of turn buckles at each end, the adult frames are adjustable in width between 12 and 17 inches, children's from

7 to 12 inches. No patient requires a frame more than 17 inches in width—over this it becomes a hammock and no longer effectively supports the spine.

Our frames are made of light weight tubing but gas pipe frames of proper length may be used with the turners by drilling a five-eighths inch hole in the center of each end by which they are fastened to the turning disk. For a standard bed they should be 6 feet 3 inches long and for the portable unit they are 6 feet 1 inch long.

COVERING OF FRAMES

The frames are covered with heavy canvas, with eyelets at 4 inch intervals along each side, and wide enough to fold over the sides of the frame when set at its greatest width. Bands of rubber stretched across the back between the eyelets are used in place of laces or straps with buckles. This keeps the canvas perpetually and evenly taut, provides for personal variations in contour and allows changing the width of the frame without removal of the frame covers. They are easily applied or removed and eliminate the necessity of frequent adjustment. A spreader is placed beneath the center of each frame to maintain uniform width. The canvas is padded with celotex or 1 inch sponge rubber, over which a draw sheet is placed and pinned beneath the frame. A 6 inch opening at the center allows toilet service. The small (6 inch diameter) chamber

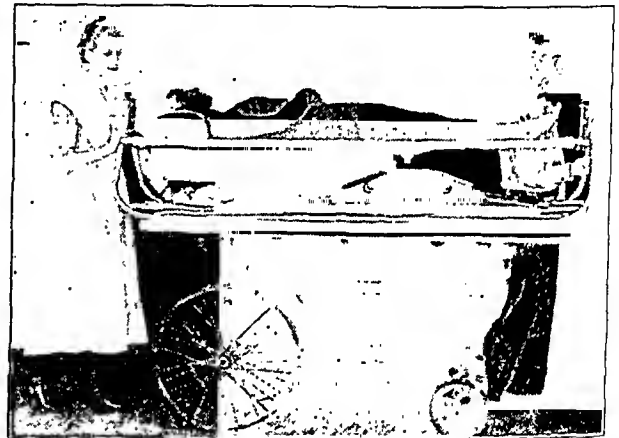


Fig. 5.—Patient on portable unit being transported to ambulance. The overhead frame, anterior frame and accessories have been detached for transportation.

mug commonly used for infants will be found more satisfactory than the conventional bedpan. It can be lifted up through the opening overlapping the edge of the canvas, which prevents soiling.

SUPPORTS FOR ARMS AND FEET

Attachments are provided for the support of the feet at right angles and for the arms at the sides of the frame. These are easily applied or removed while the patient is on the frame. The arm supports may also be used to hold the tray at mealtime.

TYPE OF BED

The turners fit on the head and foot of any standard hospital bed of either round or square design. A socket is provided on top of each turning device for the insertion of an overhead frame if desired. The turners may be used for this purpose with or without the Bradford frames. A cabinet with a reading board may be suspended from the overhead frame.

PORTABLE UNIT

For those patients who require a continuation of frame care at home or elsewhere, a portable unit is provided in which the turning device is fastened to a base which sets on the bed at the hospital or at home and may be transferred with the patient as a unit in an ambulance or invalid car. This has been especially appreciated when there is only one person available in the home to care for the patient.

1101 Baldwin Avenue.

THREE FATAL CASES OF SODIUM NITRITE
POISONING

LOUIS R. PADBERG, M.D., AND THOMAS MARTIN, M.D.
Coroner and Autopsy Physician, Respectively
St. Louis

Sodium nitrite and other inorganic nitrites are used mainly in the manufacture of dyestuffs and more recently as anti-corrosives in automobile anti-freeze mixtures. Inorganic nitrites are rarely encountered as the cause of human poisoning. It is therefore considered of value to report the following cases:

Three white men, J. N., aged 55, T. H., aged 65, and A. K., aged 70, were inmates of a cheap lodging house near the river front, the location of several wholesale chemical companies, one of which is a large distributor of sodium nitrite. Oct. 27, 1938, at about noon these three men were observed preparing a meal consisting of "beef stew" in the room of J. N. Four hours later the landlady of the house saw A. K. staggering down the stairs; when he reached the bottom he collapsed without making a statement. The landlady stated that the man's face was very pale and that his lips and the areas around the lips were purplish. The City Hospital ambulance was called, and all three men were pronounced dead on arrival at the hospital.

The bodies were immediately taken to the city morgue, where autopsies were performed.

SUMMARY OF AUTOPSIES

Gross examination of the three bodies showed the following conditions in each body:

The skin was very cyanotic, about the color of slate; the blood was thin and did not coagulate and was a dark brown, simulating prune juice.

Specifically the results of the examination in each are recorded as follows:

J. N. was 5 feet 8 inches (173 cm.) tall and weighed 140 pounds (63.5 Kg.). The hair was white and the eyes were blue; the left forearm had been amputated below the elbow. Dense fibrotic adhesions were seen in the right pleural cavity and old fibrosis was present throughout the right lung, particularly in the apex. The capsule of the kidney was adherent and did not strip readily. Other than this there were no gross abnormalities.

T. H. was 5 feet 11 inches (180 cm.) tall and weighed 175 pounds (79.4 Kg.). The hair was white and the eyes were blue. There was edema of the brain and lungs, hypertrophy of the heart, moderate sclerosis of the vessels and degenerative changes within the kidney.

A. K. was 5 feet 10 inches (178 cm.) tall and weighed 180 pounds (81.6 Kg.). The hair was white and the eyes were blue. There was edema of the brain and lungs, hypertrophy of the heart with atheromatous changes in the aorta and sclerosis of the coronary. The arteries were moderately sclerosed and the kidney showed some parenchymatous changes. Other than these abnormalities the gross examination of all viscera except the stomach was negative.

The three deaths occurring almost simultaneously after a meal might have been suggestive of botulism except that the time factor was too short and the food eaten was known to have been cooked. The viscera and blood samples of the three men together with a portion of the "stew," a box of salt and pepper and an ice cream carton containing a yellowish white crystalline substance were submitted to the coroner's toxicologist for chemical examination. Within forty-eight hours the following report was received:

On acid steam distillation of 100 Gm. portions of each portion of stomach and contents there was chemically detected in the dilute sodium hydroxide of the receiver the presence of a nitrite. A portion of this nitrite was subsequently isolated as silver nitrite and so identified. A quantitative analysis was performed on steam distillates from weighed portions of stomach and contents by the method of Lunge. Approximate amounts of nitrite, calculated as sodium nitrite and based on total weights of stomach and contents, are as follows: in J. N., 0.5 Gm. of sodium nitrite; in T. H., 0.7 Gm., and in A. K., 0.1 Gm.

Samples of the blood of the three men were submitted to spectroscopic examination for the presence of methemoglobin:

A strong absorption band of methemoglobin (630) was observed at 1:100 dilution, μ_n 7.1, in all three samples.

A portion of food containing meat and tomatoes was submitted to acid steam distillation and the presence of a nitrite was detected in the distillate.

The sample of salt and pepper was examined and found to be sodium chloride and finely ground black pepper.

Seventy-five Gm. of a yellowish white crystalline substance contained in an ice cream carton was submitted to analysis and found to be almost chemically pure sodium nitrite.

A thorough investigation was made as to the motive, but up to the present time these cases are unsolved, i.e. as to whether they were accidental, suicidal or homicidal.

1300 Clark Avenue.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING REPORTS. HOWARD A. CARTER, SECRETARY.

POLYTHERM SHORT WAVE APPARATUS ACCEPTABLE

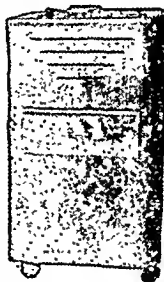
Manufacturer: Polytherm, Incorporated, 707 Broadway, Paterson, N. J.

The Polytherm Short Wave Apparatus considered in this report includes the "Advance," "Standard Cabinet" and "Portable" models. These units are identical in circuit and component parts. They are designed for use in medical and minor surgical diathermy. Standard equipment includes pad electrodes, felt spacers and surgical accessories.

Two tubes (211-B) are employed in a typical tuned-plate, tuned-grid circuit, operating at approximately 14 meters wavelength. There is a ventilator to dissipate heat from the tubes by convection. The bipolar surgery which is optional on any unit is the introduction of one terminal which is a tap on the output or pick-up coil.

The Council tests showed that with an input of 610 watts and an electromotive force of 120 volts, the maximum output obtainable was 245 watts. After two hours of operation at a maximum input of 610 watts the Council tests demonstrated a final temperature in the outside windings of the transformer which stayed within allowable limits.

The firm submitted evidence to substantiate the efficacy of the machine in producing a temperature rise in the human thigh



Polytherm Short
Wave Apparatus.

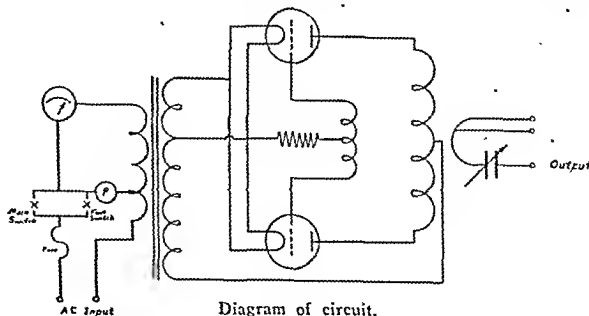


Diagram of circuit.

with the cuff technic. A reliable investigator was secured by the firm to perform these tests. Six tests were carried out and three normal male subjects were used. Cuffs measuring $17\frac{3}{4}$ by $4\frac{3}{4}$ inches were wrapped about the thigh, $7\frac{1}{2}$ inches apart. The average spacing was $1\frac{1}{4}$ inches for the right and $1\frac{1}{4}$ inches for the left. Temperature measurements were taken by thermocouples before and after twenty minute treatments. The thermocouples were inserted into the subcutaneous and intramuscular

tissue in the usual manner. Rectal temperatures were observed. The average room temperature was 76 F. The room humidity was 72 per cent.

Average temperatures (F.) of six observations after applying heat for twenty minutes are given in the accompanying table.

Average Temperatures of Six Observations

Deep Muscle		Rectal	
Initial	Final	Initial	Final
97.9	107.2	99.5	99.6

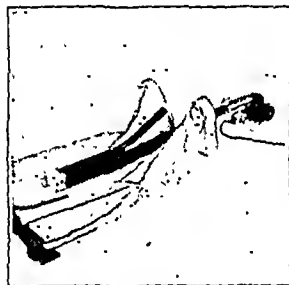
The unit was investigated clinically by the Council and found to give satisfactory service.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Polytherm Short Wave Apparatus, "Advance," "Standard Cabinet" and "Portable" Models, for inclusion in its list of accepted devices for use with the cuff technic.

TROPIDORES ACCEPTABLE

Manufacturer: Hill Laboratories Company, 128 Lancaster Avenue, Wayne, Pa.

The Tropidores is a device for continuous, local, heated air therapy. The system consists of the moving of warm air through flexible garments that may be applied locally and worn for as long as desired on the affected parts of the body. The unit is portable, the machine being small enough to be put on an ordinary bedside table. The complete assembly consists of (1) the motor, intake fan and heating coil chamber, (2) master conveying tube and connecting tubes, (3) two boots for the legs (hip length), (4) one sleeve and (5) jacket for the treatment of thorax and torso regions, supplied separately and made up according to specifications.



Tropidores.

The manufacturer states that the Tropidores is designed to induce heat controllable at any desired degree up to 145 F., which temperature is claimed to be safe when constantly applied on the full length of the extremities without danger of shock or evidence of rise of temperature in the mouth. Heated air by means of a fan with a capacity of 30 cubic feet per minute is blown through a tube. The total consumption of electricity when a standard coil is used is 230 watts an hour. The apparatus may be attached to an ordinary electric light socket by a 12 foot cable and will be supplied for alternating or direct current as specified.

The large hose from the machine is fitted into a three way connection leading to smaller hose and to the vestibules, which are at one end of each garment and allow the passage of air into the garments through numerous holes. All vestibules are removable to permit sterilization. The garments are of canvas and supplied with flannel trimmings at all body contact points, slide fasteners and draw strings. They are supposed to provide freedom of arm and leg movement and to allow the patient to turn in bed without readjusting the apparatus. The hose are also flexible. Heavy woolen stockings and gloves should be worn under Tropidores garments for the purpose of absorbing perspiration, which acts as a humidifier of inducted air. Slide fasteners should be left partly open to permit a constant flow of air.

An investigation of the unit was conducted by the Council, from which study it appeared probable that the Tropidores offers a convenient form of heated air therapy for those who are bedfast. It is necessary that an attendant, trained in the use of this apparatus, supervise the treatments, because it is possible to create unduly heated areas close to the entrance of the heated air into the garment. If the treatments are of long duration, caution must be exercised lest the sweating be so

prolonged as to cause weakness. Some restlessness and fatigue also were shown by those who were treated over four hours. It was found further, as might be expected, that there was a drop of temperature of about 15 or 20 F. from the original before the air reached the joints of the extremities.

In the light of the foregoing report, the Council on Physical Therapy voted to include the Tropidores in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
PAUL NICHOLAS LEECH, Secretary.

DILANTIN SODIUM

Sodium 5, 5-diphenyl hydantoinate, originally presented to the Council under the name "Dilantin" and marketed as "Kapseals Dilantin" by Parke, Davis & Company, has been redesignated "Dilantin Sodium" and is now marketed as "Kapseals Dilantin Sodium." Dilantin Sodium is an active anticonvulsant and relatively feeble hypnotic, used in the treatment of epilepsy. H. H. Merritt and Trace J. Putnam studied the anticonvulsant action of a number of drugs, including Dilantin Sodium,¹ and later they reported² the results of the treatment of 150 epileptic

The Comparative Effectiveness of Various Anticonvulsant Drugs in 595 Epileptic Patients

Investigator	Drug or Drugs Most Effective					Total No. of Patients
	A	B	C	D	E	
Weaver et al.....	6	..	2	..	..	14
Wexberg.....	2	2	..	..	2	7
Spurling et al.....	7	..	3	1	1	15
Bigler.....	9	1	1	2	4	19
Reese.....	42	4	2	3	1	61
Fetterman.....	10	1	..	..	..	20
Taylor.....	14	..	..	..	6	20
McNeill.....	4	12	..	..	..	16
Kimball.....	100	..	..	..	20	129
Dixon.....	22*	..	..	2	2	41
Osgood.....	24	4	..	..	13	43
Phillips.....	8	..	..	..	..	8
Merritt.....	156	3	..	..	27	202
Totals.....	404	27	8	6	1	595

A, Dilantin Sodium; B, phenobarbital; C, dilantin plus phenobarbital; D, phenobarbital plus bromides; E, bromides.

* The Council's referee accepted this figure without verifying it.

† Dilantin plus bromides.

patients with this drug. The Council also received a report of the treatment of fifty-two epileptic children by Dr. O. P. Kimball of Cleveland. While these clinical studies pointed to the therapeutic value of Dilantin Sodium the Council requested additional information, with especial reference to the toxicology, the side actions and the limitations of its usefulness.

Pharmacologic studies were conducted in the laboratories of Parke, Davis and Company, and clinical investigations were made in a number of institutions, five of them in institutions for the treatment of epilepsy and kindred conditions.

The pharmacologic studies show that Dilantin Sodium is of relatively low toxicity when administered orally to rats, rabbits and dogs, and much more toxic when injected intravenously. A special investigation was conducted to show whether Dilantin Sodium interferes with the utilization of ascorbic acid, after Kimball had reported hyperplasia of the gums suggestive of

1. Merritt, H. H., and Putnam, T. J.: A New Series of Anticonvulsant Drugs Tested by Experiments on Animals, *Arch. Neurol. & Psychiat.* 39: 1003 (May) 1938.

2. Merritt, H. H., and Putnam, T. J.: Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Disorders, *J. A. M. A.* 111: 1065 (Sept. 17) 1938.

scurvy. The results of the experiments on animals did not indicate that the drug has any influence on the utilization of ascorbic acid.

Physicians who studied Dilantin Sodium therapeutically were furnished with forms for recording data. Some sixty pages of these forms were submitted to the Council by the firm, which received them from ten observers who had treated 437 patients. The headings of the forms included history, age, sex, age at onset, etiology, type of attacks, reactions and treatment, including dosages and a comparison of results with phenobarbital and Dilantin Sodium.

The side actions reported by one or more include dizziness, dry skin, dermatitis, rash, itching, tremors, fever with temperature of 104 F. in one case, nausea, vomiting, blurred vision, fatigue, apathy, difficult breathing and swallowing, nervousness, mental confusion and active hallucinations. Hyperplasia of the gums has been reported by Kimball.

It would require much space to present a summary of the work of every one of the clinical investigators, but it is believed that the accompanying table submitted by Parke, Davis and Company (and confirmed by the Council's referee) affords a fair statement of the chief points of interest.

The Council voted that the firm be informed (1) that the available evidence justifies the recognition of Dilantin Sodium as a therapeutic agent of promising value in the treatment of many cases of epilepsy and (2) that Dilantin Sodium will be accepted for inclusion in N. N. R. provided the firm will agree to market it under rigid restrictions, including those which further experience shall indicate, as well as the following: (a) It shall not be recommended for use by the general practitioner unless he is able to maintain a close (daily) supervision of the patient, until the scope of its usefulness as well as its side actions have been determined more accurately; (b) it is not to be recommended for the treatment of those patients whose seizures occur only at long intervals unless moderate doses of phenobarbital are ineffective or induce disagreeable side actions. The firm has agreed to these conditions. The A. M. A. Chemical Laboratory has found the composition of Dilantin Sodium satisfactory.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

DILANTIN SODIUM.—Sodium 5,5-diphenyl-hydantoinate. — Sodium 2,4-diketo-5,5-diphenyl-tetrahydroglyoxaline. — The mono-sodium salt of 5,5-diphenyl-hydantoin,

$\text{Na}(\text{C}_6\text{H}_5)_2\text{C.NH.CO:N.C:O}.$

Actions and Uses.—Dilantin sodium is an anticonvulsant with a relatively weak hypnotic action. It is used in the treatment of epileptic patients who are not benefited by phenobarbital or bromides and those in whom these drugs induce disagreeable side actions. Dilantin sodium appears to be more effective in controlling seizures of the grand mal type than in those of the petit mal. It does not cure congenital mental defects or the mental deterioration often observed in the epileptic. Various side actions of different degrees of severity which have been observed include dizziness, dry skin, dermatitis, rash, itching, tremors, fever, nausea, vomiting, blurred vision, fatigue, apathy, difficult breathing and swallowing, nervousness, mental confusion and active hallucinations, and hyperplasia of the gums suggestive of scurvy, though its use does not interfere with the utilization of vitamin C. Dilantin sodium is strongly alkaline and it may give rise to gastric irritation.

Dosage.—The optimum dosage of dilantin sodium must be determined by the daily observation of its effects by the physician. The influence of the drug on seizures and the appearance of any of the side actions enumerated must be a guide to the dosage. Mild symptoms do not necessarily require that the dosage be stopped. The beginning adult dose is 0.1 Gm. (1½ grains) with at least half a glass of water three times daily. If necessary this dose may be increased gradually to 0.2 Gm. (3 grains) three times daily. Children above the age of 6 years may be given 0.1 Gm. (1½ grains) three times daily for one

week, after which it may be increased if necessary to 0.1 Gm. (1½ grains) four times daily with at least half a glass of water to prevent gastric irritation due to the alkalinity. Dilantin sodium is more rapidly effective if given before meals, but should it cause gastric irritation it should be given immediately after meals. Children under 4 years of age may start with 0.03 Gm. (one-half grain) mixed with cream (to disguise the bitter taste and to prevent gastric irritation) twice a day. Obviously such doses require the most careful supervision. If this dose is borne without side actions the dosage may be increased to 0.03 Gm. (one-half grain) three or four times a day. Every slight increase in dosage is made only after the physician is convinced that such increase is necessary and that no harm is to be anticipated.

The transition from phenobarbital, bromides or other hypnotic-type drugs to dilantin sodium should be made gradually with some overlapping in dosage. By this procedure the danger of phenobarbital or bromide withdrawal symptoms (increased number of seizures) is minimized, and side actions incident to the beginning administration of Dilantin Sodium are lessened.

Manufactured by Parke, Davis & Co., Detroit. No U. S. patent. U. S. trademark applied for.

Kapsals Dilantin Sodium 0.1 Gm. (1½ grains): Each kapsal (hermetically sealed capsule) contains 0.1 Gm. (1½ grains) of sodium 5,5-diphenyl hydantoinate.

Kapsals Dilantin Sodium 0.03 Gm. (½ grain): Each kapsal (hermetically sealed capsule) contains 0.03 Gm. (½ grain) of sodium 5,5-diphenyl hydantoinate.

Dilantin sodium occurs as an odorless, white, microcrystalline powder, possessing a slightly bitter taste. It is soluble in alcohol and glacial acetic acid; practically insoluble in ether, petroleum ether and benzene. Aqueous solutions of dilantin sodium yield an opalescent crystalline precipitate of diphenyl-hydantoin, which dissolves when the pH of the mixture is adjusted to 11.7.

Dissolve about 0.25 Gm. of dilantin sodium in 5 cc. of boiled water; the mixture should not require more than 1 cc. of tenth-normal alkali to produce a clear, colorless solution; add an excess of diluted hydrochloric acid, shake thoroughly, collect the precipitated diphenyl-hydantoin on a filter paper, wash with water and dry at 95 C.; it melts at 293-299 C. with decomposition.

Treat about 0.5 Gm. of dilantin sodium with 10 cc. of solution of sodium hypochlorite, heat to 50 C., pass in carbon dioxide; collect the precipitate formed on a filter paper. Dry the precipitate in a partial vacuum and recrystallize from chloroform; the melting point of the 5,5-diphenyl-1,3-dichloro-hydantoin lies between 163 and 167 C.

Incinerate about 0.2 Gm. of dilantin sodium; the residue responds to tests for sodium carbonate.

Dissolve about 0.5 Gm. of dilantin sodium in 100 cc. of water, add 5 cc. of diluted nitric acid, shake and filter through paper; separate portions of 10 cc. each of the filtrate yield no greater opalescence on addition of 1 cc. of silver nitrate solution than that produced by 0.25 cc. of tenth normal hydrochloric acid in 50 cc. of water (chlorides) or no appreciable turbidity on the addition of 1 cc. of barium nitrate solution (sulfates). Acidify about 0.2 Gm. of dilantin sodium in 50 cc. of water with diluted hydrochloric acid, using litmus paper as the indicator; filter through paper; a 10 cc. portion of the filtrate yields no color or precipitate on saturating with hydrogen sulfide (salts of heavy metals). Dissolve 0.1 Gm. of dilantin sodium in 5 cc. of sulfuric acid; the color produced should not be greater than that yielded by 0.1 mg. of benzoic acid in 5 cc. of sulfuric acid.

Heat about 0.5 Gm. of dilantin sodium, accurately weighed, to constant weight at 95 C.; the loss in weight should not exceed 2.5 per cent. Transfer about 0.25 Gm. of the dry dilantin sodium, accurately weighed, to a separatory funnel, add 50 cc. of water and 10 cc. of diluted hydrochloric acid; extract the mixture with 100 cc. of ether and repeat the extraction with four successive 25 cc. portions of ether; evaporate the combined ether extracts in a tared beaker and dry to constant weight at 95 C.; the 5,5-diphenyl-hydantoin should amount to not less than 90.6 per cent, nor more than 92.0 per cent of the dry sample, and should melt above 292 C.

FUNGUS EXTRACTS-ABBOTT.—Liquids obtained by extracting dried spores with a menstruum consisting of equal volumes of glycerin and a solution containing sodium chloride 5 Gm. and sodium bicarbonate 2.7 Gm. in distilled water 1,000 cc.

Actions and Uses.—See general article Allergic Protein Preparations, New and Nonofficial Remedies, 1939, p. 27.

Dosage.—See general article Allergic Protein Preparations, New and Nonofficial Remedies, 1939, p. 27.

Fungus Extracts-Abbott are marketed in 2 cc., 5 cc. and 30 cc. vials.

Manufactured by the Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

Alternaria spp. Fungus Extract-Abbott: *Aspergillus fumigatus* Fungus Extract-Abbott; *Aspergillus niger* Group Fungus Extract-Abbott; *Cephalothecium roseum* Fungus Extract-Abbott; *Hormodendrum* spp. Fungus Extract-Abbott; *Monilia sitophila* Fungus Extract-Abbott; *Mucor* spp. Fungus Extract-Abbott; *Penicillium rubrum* Fungus Extract-Abbott; *Ustilago zeae* (Corn Smut) Fungus Extract-Abbott; *Yeast* Fungus Extract-Abbott.

The yeast extract is prepared from dried brewers' yeast; the *Alternaria* spp. extract is prepared from the dried mass of spores with its supporting mycelium; the other extracts are prepared from the dried spores alone. The material is extracted at room temperature with a menstruum consisting of equal volumes of glycerin and a solution containing sodium chloride 5 Gm. and sodium bicarbonate 2.7 Gm. in distilled water 1,000 cc. for from four to five days and is clarified and sterilized by Berkefeld filtration. The finished liquid is a 5% W/V 0.05 Gm. of dried fungus material, each cubic centimeter representing

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SATURDAY, NOVEMBER 4, 1939

MEDICAL SERVICE IN A TEACHING HOSPITAL—DR. CHRISTIAN'S "FAREWELL REPORT"

Medicine has developed through the labor of many and under the leadership of relatively few. During the past half century medicine in general, and American medicine in particular, have undergone revolutionary changes. The mystic, religious and philosophical domination has given way to the influence of natural and social sciences. The beneficial yield of objectivity to human society has surpassed the most optimistic expectations. Will the importance of personal leadership wane in the light of these recent changes? A superficial analysis of this problem might suggest that the introduction of exact sciences into medicine has decreased considerably the need for leadership. A more detailed study of the question indicates however that, precisely because of the rapid growth and of the diversified interests represented in modern medicine, guidance and correlation in medical education and practice are becoming more important than ever.

The Peter Bent Brigham Hospital under the leadership of Dr. Henry A. Christian and the late Dr. Harvey Cushing assumed a significant role in the establishment of modern clinical medicine in America. When the doors of this university clinic opened in 1913, it was one of the few institutions in the country which especially cultivated scientific clinical medicine. Since then fortunately the situation has changed. Now there are a number of important medical centers which represent different experiments in medical education. For this reason Dr. Christian's "farewell report" in the twenty-fifth Annual Report of the Peter Bent Brigham Hospital is of particular interest.¹ Here is the advice of a physician in chief who during a quarter of a century observed intimately the development of American medicine.

Dr. Christian describes what he believes should be the aims and the spirit of a medical service in a hospital. He points out that he who directs a hospital

service must have a plan, a method, an ideal of perfection. The service must represent the highest accomplishment of leadership. Time and conditions change rapidly. Hence always there must be a willingness to meet changing conditions. A spirit of friendly helpfulness should pervade both the practical care of the patient and the scientific study of the medical problem. The best possible professional care should be administered to the patient in such a way that he feels that all in the hospital are interested in him as an individual. To the students and to the young physicians should be given a training with a broad foundation on which they can build themselves into the best type of clinicians. In such a training the art of good observation, the cultivation of memory, of logic and of technical skill, as well as the development of personality are essential. Diagnostic opinions should be expressed clearly and in writing. Dr. Christian states that ". . . often cowardice prevents such commitments." He criticizes the present tendency to say that the mass of literature is so great that no one can keep up with it. "To my mind this is but an excuse of the lazy." Specialization is essential but must be based on broad experience. He quotes Osler, who spoke of Jonathan Hutchinson as ". . . the only great generalized specialist which the profession has produced."

Dr. Christian, referring to himself, says ". . . the hospital physician busied daily in the care of patients, in contact with students, resident staff, associates and colleagues; this seemed to me the acme of attainment when in the days of my youth I dreamed dreams."

Traditions are to be cherished only if they represent the best in the professions. It is for this reason that Dr. Christian's report, an expression of need for a harmonious balance in medicine, is of importance to the profession.

A NEW INTERPRETATION OF A PARAGRAPH IN THE HIPPOCRATIC OATH

The paragraph referring to lithotomy in the Hippocratic Oath, οὐ τεμέω δὲ οὐδὲ μὴν λιθιῶντας, ἐκχωρήσω δὲ ἐργάτησιν ἀνδράσι πρῆξις τῆσδε, is one of the most confusing in classical literature. It has been generally assumed that the oath forbids the performance of lithotomy. The two usual justifications for this injunction are (1) that the operation was often fatal and was therefore delegated to another expert group, and (2) that the oath indicates the beginning of specialization in Greek medicine as already existed in Egypt. These appear to a recent student of history to be absurd. Savas Nittis¹ states that sufficient grammatical and linguistic consideration has never been given to this paragraph. Instead a meaning was assumed and explanations for the injunction against lithotomy were sought afterward. Nittis proposes a new interpretation of the paragraph. His translation, for which gram-

1. Report of the Physician-in-Chief, Twenty-Fifth Annual Report of the Peter Bent Brigham Hospital for the year 1938, 1939, p. 92.

1. Nittis, Savas: The Hippocratic Oath in Reference to Lithotomy: A New Interpretation with Historical Notes on Castration, Bull. Hist. Med. 7: 719 (July) 1939.

matal and etymological reasons are given, would be as follows: "I will not cut, indeed not even sufferers from stone, and I will keep apart from men engaging in this deed." Since surgery could not be forbidden in those early times, the injunction in the oath, it is said, must refer to some abomination, such as castration, since *τέμνειν* means "to castrate."

Lithiasis was a common complaint in the early centuries in the Near East and still is. It must have required much attention by physicians; then instruments were invented for locating stone in the bladder. Who would seriously contend, therefore, that the ethical surgeon who performed these diagnostic procedures was prevented from doing lithotomy by an oral oath or a written contract? Celsus, who described lithotomy in the first century, was copying from an earlier Greek source. Comment by Aretaeos indicates that lithotomy was frequently performed by the best representatives of the Hippocratic school. Naturally serious complications often followed such an operation. Death frequently ensued and, if the patient survived, a resulting fistula often made life unbearable. Since the only relief came from cutting in the region of the urethral orifice of the bladder, necrosis of the testicles must have frequently followed lithotomies as a result of occlusion of the spermatic artery. Since it would have been easier for the surgeon to remove the interfering external genitalia before the lithotomy was performed, Nittis suggests, that practice was probably followed by some surgeons. Indeed, Nittis asserts that castration probably was the most frequently performed operation in ancient times.

In the *Odyssey* there is mention of an establishment where men were sent for castration. Herodotus speaks of one Panionios, of Chios, who "made his living from a most unholy trade. Whenever he came into possession of boys with good looks he castrated them and, bringing them to Sardis and Ephesus, sold them for a good price." In Rome, where the vices of Greece were imitated, castration for commercial or immoral purposes was usually carried out by the *magrones*, a special group of practitioners. While the regular physician probably performed castrations occasionally for some legitimate cause, neither Hippocrates nor Aristotle advised castration. During the early Christian era the number of castrates must have been impressive, for the first Ecumenical Council of Nice provided in its first canon to permit holy orders to a man "if he had been castrated by a physician on account of illness." During the Middle Ages, castration was advocated for the cure or prevention of many diseases, and until recently it was sometimes performed for the cure of epilepsy. In Europe following the renaissance, castration found widespread application for the prevention and cure of hernia. The general opinion that the castrated singers in the churches of Rome did not suffer from hernia promoted the idea. During the eighteenth century this abuse reached alarming proportions. The

physician was free to use or abuse his judgment without legal restrictions in Greek society. Laws did not exist to penalize the physician or to award damages for malpractice to the patient or his family. In the oath, Hippocrates attempted to formulate the essential moral obligations of the physician and, according to Nittis, to prevent the practice of this abominable operation.

TRAVELING FACULTIES IN GRADUATE MEDICAL EDUCATION

The problem of continuation study for practicing physicians is no longer one concerned exclusively with education; transportation is beginning to be of considerable importance. A graduate program may be quite sound educationally and yet fail if it does not bring competent instructors to physicians desirous of continuing their studies. This is especially true in the more sparsely settled areas of the United States and in those states without medical schools.

For the past five years the physicians of Idaho have appreciated the need for continuation study. To meet this need they have brought to the five day annual meeting of their state association a flying medical faculty. Each year five or six instructors from one medical school have been invited to organize an integrated, correlated course of study of general interest to practicing physicians. Instruction in basic sciences has initiated discussions of clinical studies, and round table discussions have permitted attending physicians to participate. Expenses of the traveling faculty have been paid by the state association, since registration fees of \$5 or \$10 have been adequate to finance these programs.

In 1939 the state medical associations of Washington and Oregon arranged their annual meetings to utilize the same traveling faculty as was engaged in Idaho. Thus the physicians of three states have had the opportunity to attend, at their annual meetings, a continuation course. Attendance has been enhanced, and it has been possible to bring to each state systematic instruction at less expense than is ordinarily required.

Four other western states, Colorado, Utah, New Mexico and Wyoming, have pooled their interests in graduate studies to bring, every two years to one of their states, twenty out of state speakers to discuss problems of medicine and public health which are peculiar to the Rocky Mountain region. The medical society in each state has been represented on the executive committee and a different state society has acted as host every two years. The first Rocky Mountain Conference was held in Denver in 1937, the second in Salt Lake City in 1939, and the next meeting is scheduled for Wyoming. A registration fee of \$3 has been sufficient to finance this effort.

Thus seven states, five without a four year medical school within the borders of the state, have provided

See Graduate Medical Education: Idaho, Oregon and Washington, in the Organization Section, this issue.

graduate opportunities for practicing physicians. Frequently physicians travel from 100 to 250 miles to attend one or two day regional meetings.

There still remain, however, physicians who are unable to leave their practice even for a short time to travel the distance required. For them provision is now being made, the instructors traveling throughout the state so that continuation study may be brought to a greater number of communities.

Current Comment

NOBEL PRIZE TO PROFESSOR DOMAGK

The Nobel Prize for Medicine was recently awarded to Prof. Gerhard Domagk, whose name is indelibly associated with the drug sulfanilamide and its derivatives. Domagk was born in Lagow, Germany, in 1895. His principal early work was in the field of pathology. After teaching at Greifswald and Muenster universities he became director in 1927 of the Institute of Experimental Pathology of the I. G. Dye Works in Elberfeld. Late in 1932 he first demonstrated the curative effects of prontosil (now neoprontosil) in the streptococcal infections of mice. After many careful observations, the details of the new discovery were finally published by Domagk in medical and scientific journals early in 1935. He had earlier received the Emil Fischer Medal, highest award of the German Chemical Society, in 1937 and the Cameron Prize of the University of Edinburgh in 1939.

RABIES

The study of rabies conducted by the International Health Division of the Rockefeller Foundation in cooperation with the Alabama State Board of Health already has been prosecuted to the point where the building program has been completed.¹ The total expenditures for public health work in this field have come to more than \$108,000 for the four years 1935 to 1938 inclusive. Particular attention is being directed to a study of the efficacy of preventive measures in rabies. Alabama, with an estimated dog population of 450,000, vaccinated 220,000 dogs during 1937, the first year the compulsory law went into effect. During 1938, 134,000 dogs were vaccinated and nearly 18,000 killed as strays. Attempts have also been made to determine whether the rat plays a part in the spread of rabies, but so far experiments of this nature have been negative. All attempts to cultivate rabies street virus have been unsuccessful. A fixed strain obtained from the Alabama State Board of Health has been carried through sixty-eight transfers without difficulty. As yet it has been impossible to obtain growth on the chick embryo. A report on the effect of various diluents acting for short periods on the rabies virus in high dilutions has also been made. A fruitful outcome to these investigations would be of tremendous benefit to many portions of the country in which rabies remains endemic.

CHRONIC LEUKEMIA

Because of the characteristic insidious onset of the leukemias they are usually first recognized only after widespread anatomic and physiologic abnormalities have developed. Wintrobe and Hasenbush¹ reviewed all cases of chronic leukemia in adults observed at the Johns Hopkins Hospital between January 1926 and August 1938, collecting thirty-nine cases of myelogenous and forty-seven cases of lymphogenous leukemia for study. Five of the patients who subsequently developed typical chronic myelogenous leukemia were found to have unexplained leukocytosis in the absence of typical leukemic signs or symptoms. The discovery was made in the course of routine examination following pregnancy in one case, for sterility in another, because of symptoms suggestive of disease of the gallbladder in the third, for abdominal distress in the fourth, and because of uterine myomas in the last. A reasonable estimate of the time elapsing from the onset of chronic myelogenous leukemia until symptoms of the disease commonly cause the patient to seek medical attention is probably from two to five years or longer. Data concerning the early phase of chronic lymphogenous leukemia were available in sixteen cases. The disease was first discovered in three men aged 59, 67 and 72 when examined for symptoms due to prostatic hypertrophy. Other patients were examined because of sugar in the urine, a psychoneurotic disorder and "indigestion." Unlike myelogenous leukemia, the finding of unexplained leukocytosis was the first evidence of the disease in only about one third of the cases of early lymphogenous leukemia. In another third, glandular enlargement was the sign which first attracted attention. The time interval between the observation of signs suggesting lymphogenous leukemia and the development of symptoms of the disease was from one and one-half to two and one-half years. The earlier recognition of lymphogenous leukemia, as compared with that of myelogenous leukemia, is explained, these authors believe, by the greater frequency with which glandular enlargement sufficient to attract attention occurred in the patients with the former. Males predominated in both groups. In 72 per cent of the cases of myelogenous leukemia the age of onset was between 30 and 59 years, while in 61.7 per cent of the cases of lymphogenous leukemia symptoms began between 50 and 69 years. In addition to the unexplained leukocytosis so frequent in early chronic myelogenous leukemia, distinct lymphocytosis was found commonly characteristic of early lymphogenous leukemia even when the leukocyte count was relatively low. Solution of potassium arsenite was without value in lymphogenous leukemia and of less value than irradiation in myelogenous leukemia. Response to irradiation was slightly better in myelogenous than in lymphogenous leukemia. Contrary to the frequently expressed opinion, infections in the majority of cases did not produce a remission in physical signs or the blood picture. Persistent unexplained leukocytosis must therefore be considered a premonitory sign of chronic myelogenous leukemia, and persons in whom it occurs should be carefully studied with that disease in mind.

1. Annual report of International Health Division of the Rockefeller Foundation, 1938, p. 62.

1. Wintrobe, M. M., and Hasenbush, L. L.: Chronic Leukemia. Arch. Int. Med. 64: 701 (Oct.) 1939.

ORGANIZATION SECTION

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

WASHINGTON

WASHINGTON STATE MEDICAL ASSOCIATION

On Aug. 30, 1939, the House of Delegates of the Washington State Medical Association resolved that a program for providing postgraduate medical education in the state of Washington be developed by the postgraduate medical education committee under the general supervision of the board of trustees. This committee, with Dr. Homer D. Dudley as chairman, has considered the postgraduate experiences of various state societies. On the basis of these studies the committee has recommended the following program:

1. Continuation of the graduate medical course for physicians throughout the state given annually in cooperation with the King County Medical Society and the Extension Division of the University of Washington with the additional assistance of the postgraduate committee of the state medical association, the association aiding in the arrangements and in publicity.

2. Inauguration of circuit courses by out of state lecturers under the supervision of the committee by providing defined lecture districts, securing competent speakers for a series of five days' instruction in each locality, including clinics, stressing subjects chosen by the physicians of each district, and by charging registration fees adequate to finance the regional program.

3. Provision of speakers from the membership of the state association to supplement the out of state lecturers. This will be made from a list compiled by the association. From the list component county medical societies may choose competent Washington physicians, and each society will be expected to finance their expenses.

4. Desirability of having other committees concerned with medical education consult with the committee. The postgraduate committee has emphasized this so that all postgraduate activities within the state may be properly correlated and coordinated.

The 1939 annual meeting of the Washington State Medical Association, held in Spokane, was devoted to graduate instruction. Five instructors from Washington University School of Medicine, St. Louis, were engaged in a cooperative agreement with the state medical associations of Oregon and Idaho. At the three day annual meeting, subjects discussed included cancer, chemotherapy, cholecystography, infant feeding, pneumonia, puerperal infection and toxemias of pregnancy. Attendance totaled 460 physicians. Of the 2,123 physicians in the state of Washington, 1,468 are members of the state medical association.

WASHINGTON STATE DEPARTMENT OF HEALTH (Instruction in Obstetrics and Pediatrics)

Previous to 1938 the education program of the Washington State Department of Health for physicians practicing in the state had been carried on through itinerant child health conferences. It was proposed in 1938 that the itinerant conferences be held only as a means of introducing a clinic or of determining the need for a clinic in a given area, the educational program to consist largely of a refresher type of course by recognized authorities in obstetrics or pediatrics. An out of state physician and Washington physicians were to consider such subjects as endocrinology, internal medicine, nutrition and dental problems.

In May 1938 an out of state obstetrician gave three days of lectures and conferences in each of seven cities of the state. The committee on maternal and child welfare of the state medical association cooperated in sponsoring this program. A \$2 registration fee was charged. The course of six lectures was attended by 217 physicians.

The chairman of the committee on maternal and child welfare, Dr. H. H. Skinner, recommended in 1938 that the committee membership be made permanent and that the committee be composed of an equal number of obstetricians and pediatricians serving overlapping five year terms.

In 1938 a committee of eight was formed as a permanent committee on medical cooperation and participation in the maternal and child hygiene program of the state department of health. On this committee were three representatives of the Washington sections of the North Pacific Pediatric Society, three of the Washington State Obstetrics Association and the director of the state department of health and the chief of the division of maternal and child hygiene. This committee now acts in an advisory capacity to the health department.

During May 1939 the division of maternal and child hygiene of the state department of health and the committee of eight jointly sponsored a three day series of afternoon and evening lectures in seven cities of Washington and in Vancouver, B. C. The assistance of county medical societies was enlisted in each locality and the secretaries were provided with post card announcements. An out of state medical school instructor gave six lectures on heart diseases, hemorrhage and toxemias of pregnancy, obstetric analgesia and cesarean sections in each center. Six hundred and thirteen physicians was the total attendance recorded. No registration fees were charged, since the state department of health provided financial support.

UNIVERSITY OF WASHINGTON

The University of Washington, Seattle, in cooperation with King County Medical Society, has conducted a five day graduate medical course during July each year since 1916. Dr. David C. Hall is executive secretary of the course and Dr. Raymond L. Zech was chairman of the county society committee of fourteen in 1939. There is also a committee of five staff members of the King County Hospital responsible for organizing clinical instruction. Every year four or more out of state physicians are engaged as a faculty, and in July 1939 five members of the faculty of Northwestern University Medical School, Chicago, and a member of the United States Public Health Service participated. Local physicians supplement the guest speakers by providing clinics. Instruction is scheduled from 9 a. m. to 10 p. m. daily. Major subjects of medicine are included and in case discussions two or three physicians participate, stressing the various approaches to the problems presented. Lectures are held on the university campus and clinics and demonstrations are given at the county hospital by members of the staff. Didactic lectures are limited to from forty to fifty minutes and clinics to from ten to twenty minutes. Medical and surgical clinics considered thirteen of the various specialties of surgery and three of the special subjects of medicine in 1939. Daily demonstrations were held in pathology, roentgenology and anesthesia as well as scientific exhibits in other subjects.

The extension division of the university aids in administering the course. A registration fee of \$10 is charged which has provided sufficient support. Every physician in the state is sent a notice; announcements are published in *Northwest Medicine*. Annual attendance has ranged from 207 to 311 physicians.

LIBRARY SERVICE

The King County Medical Society, in addition to the active participation of its members in the annual graduate programs at the University of Washington, has provided library facilities for physicians practicing in the vicinity of Seattle. Space has been provided in the Cobb Building, Seattle, with adequate stacks and reading rooms. There are 11,468 volumes, three fifths of which are periodicals, a total of 233 being regularly

received. Ten dollars from the annual dues of every county society member supports the library. About two thirds of the members of the society used the library in 1938, as well as approximately 200 other physicians. The package lending service is available to individuals or to other libraries. Out of town physicians must supply postage. During 1938, 6,300 items were circulated.

Libraries with paid librarians are also maintained by the Spokane County Medical Society and the Pierce County Medical Society, the facilities being available to physicians practicing in the vicinity of Spokane and Tacoma.

OTHER GRADUATE ACTIVITIES

The Seattle Surgical Society provides a two day program each year. The Spokane Surgical Society, the Puget Sound Surgical Society and the Tacoma Surgical Society present annual graduate days. One or more guest speakers are provided to discuss cases presented by Washington physicians. Members of state medical associations are invited to attend. Registration fees vary from \$2 to \$3.

IDAHO

IDAHO STATE MEDICAL ASSOCIATION

At the September 1933 meeting of the House of Delegates of the Idaho State Medical Association, it was recommended by Dr. J. N. Davis that graduate study be considered and that the advisability and feasibility of securing members of medical school faculties for an annual continuation course be determined.

In September 1934 the house of delegates authorized the president of the state association, Dr. Charles R. Scott, to appoint a committee of six members to arrange a graduate course for the next annual meeting. Fifteen hundred dollars was the initial allocation for financing the state association's graduate program.

In planning the course of instruction certain principles were elaborated, since it was felt that the medical association had two primary obligations, first, to improve medical care and, second, to enlighten the public on personal and public health. It was decided that five days should be devoted each year to an integrated and correlated course of instruction in subjects of general interest selected on suggestions of physicians. Five instructors from a different medical school each year would organize as a traveling faculty, thus providing a harmonized course. Each day five or six fifty minute lectures would be scheduled with additional round table discussions.

The state association has assumed responsibility for financing its graduate program. In 1936, when the constitution and by-laws of the association were modified, the Idaho Medical Foundation was established with the members of the council as trustees of the foundation. A foundation fund of \$10,500 was established by contributions from members of the state association which constituted a percentage of fees which they had received for the care of special groups of patients. The income from the foundation's funds is available for financing graduate activities. This has not been necessary, however, since registration fees of \$5 or \$10 have been sufficient to meet each year's expenses. Each speaker is given an honorarium and his traveling expenses.

The committee on scientific work of the state association is a standing committee consisting of three members, one selected each year to serve three years. The present chairman of this committee is Dr. C. W. Pond. Ex officio members are the president and the secretary-treasurer of the association. The secretary acts with the committee on scientific work in arranging the annual graduate program.

Beginning in 1935 a traveling faculty from the following medical schools has participated each year: Northwestern University Medical School, University of California Medical School, University of Minnesota Medical School, University of Michigan Medical School and Washington University School of Medicine. In 1937 Idaho physicians presented clinical cases for discussion in local hospitals to supplement the faculty lectures. Attendance has varied from 116 to 144. Of the 406 physicians in Idaho, 272 are members of the state association.

IDAHO STATE DIVISION OF PUBLIC HEALTH

In November 1936 the Idaho State Division of Public Health, in cooperation with the Idaho State Medical Association, conducted an itinerant postgraduate lecture course in six cities of

the state. Three out of state physicians participated in the one and two day afternoon and evening sessions in obstetrics and pediatrics. The chairman of the state association's committee on scientific work arranged the program and selected the speakers. The county medical society in each locality arranged the details for each meeting. The course was attended by 181 physicians; no registration fees were charged. The health division financed this effort.

During 1937 instruction in pediatrics was provided in two cities of the state by one out of state physician. Attendance at these lectures approximated seventy-five.

In April and May 1938 four out of state physicians conducted a postgraduate course in pediatrics, dermatology and syphilology and orthopedics in five cities of the state. One day sessions were held in four places and two days were allowed in a fifth. Meetings were held in hotels and in two cities; clinical demonstrations were attempted. Approximately 150 physicians attended the 1938 itinerant course.

Lectures in syphilology, pediatrics, orthopedics and general medicine were given in the spring of 1939. Three out of state physicians participated in one day meetings held in five localities. One hundred and seventy physicians enrolled. No registration fees were charged.

IDAHO ANTI-TUBERCULOSIS ASSOCIATION

During the past two years the Idaho Anti-Tuberculosis Association has offered a consultation service to practicing physicians of the state in the interpretation of roentgenograms. The consultant also participates in the activities of the state division of public health.

OREGON

OREGON STATE MEDICAL SOCIETY

At the 1939 annual meeting of the Oregon State Medical Society three out of state faculty members who had participated in the annual meetings in Idaho and Washington took part in the scientific program. A fourth guest speaker was also included. This enabled the committee on scientific work to provide members of the association with an integrated general course of twelve lectures in pediatrics, obstetrics, surgery and medicine. Round table discussions were held and twenty-four contributions were made by Oregon physicians on other subjects. The three and one-half day session was devoted substantially to postgraduate instruction and, by the cooperative agreement with the medical societies of two adjoining states, it was possible to present a comprehensive and instructive program. There are 805 members of the Oregon State Medical Society of the 1,386 physicians in the state.

At the June 1939 meeting of the council of the state medical society the president of the society, Dr. Charles E. Sears, was authorized to appoint a committee on postgraduate medical education. Dr. Karl H. Martzloff was made chairman of a committee of five members. This committee met in September 1939 to discuss the establishment of a graduate program.

The Oregon State Medical Society, in cooperation with the Oregon State Board of Health, provided one or two days of lectures in obstetrics and pediatrics in nine cities of the state this year. The committee on maternal welfare, Dr. Raymond Watkins, chairman, with the director of the division of maternal and child health, Dr. G. D. Carlyle Thompson, arranged the lecture series for May 1939. Each component medical society which participated selected topics from a list of twelve subjects outlined by the out of state obstetrician and pediatrician engaged to give the instruction. From six to ten afternoon and evening lectures were held in each center, except one in which the instruction began at 9 a. m. Two hundred and seventy-seven physicians from twenty-one counties enrolled. No registration fees were charged, since the program was supported by federal funds.

The Oregon Academy of Ophthalmology and Otolaryngology and the University of Oregon Medical School have provided a week of lectures and clinics at Portland for ophthalmologists and otolaryngologists over the past four years. While the course is primarily intended for physicians in special practice, subjects of general interest to practicing physicians are included. Surgical anatomy of the head and neck is demonstrated at the medical school and two out of state speakers present didactic

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instruction. This is followed by round table discussions and outpatient clinical exercises. A registration fee of \$25 is charged. The average number of physicians attending is sixty. The University of Oregon Medical School has developed a traveling clinic under its child guidance program and during 1937-1938 established thirteen centers over the state. Teams consisting of three instructors from the medical school have

constituted the staff of this traveling clinic and when a district was visited these instructors were available for discussions and demonstrations before the local medical society. The University of Oregon Medical School provides library facilities for practicing physicians. During 1938-1939, 499 Oregon physicians and thirty-eight physicians from other states made use of the library.

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:
November 8—Public Health Meeting, Springfield, Mass.
November 16—Rush Medical College, Senior Students, Chicago.
November 28—Chicago Control of the Controllers Institute of America, Chicago.

DR. MORRIS FISHBEIN:
November 7—Tufts Medical School, Boston.
November 7—Greater Boston Medical Society, Boston.
November 8—Association for Advancement of Industrial Medicine and Surgery, New York.
November 9—Essex County Medical Society, Newark, N. J.
November 10—Hudson County Medical Society, Jersey City, N. J.
November 14—Northwestern University School of Journalism, Evanston, Ill.
November 21—Central Lions Club, Chicago.
November 28—Public Affairs Group, Chamber of Commerce, Omaha.

November 28—University of Nebraska College of Medicine, Omaha.
November 28—Crichton University School of Medicine, Omaha.
November 28—Omaha-Douglas County Medical Society, Omaha.
November 30—Rush Medical College, Chicago.

DR. EDWIN P. JORDAN:
November 17—Woman's Auxiliary, Aux Plains Branch, Chicago Medical Society, Chicago.

DR. R. G. LELAND:
November 21—Lake View High School Civic Forum, Chicago.

DR. ROCK SLEYSER:
November 10—Woman's Auxiliary to the Medical Society of Milwaukee County, Milwaukee.

November 16—County Medical Society, Springfield, Ill.
November 22—Southern Medical Association, Memphis, Tenn.

DR. PAUL A. TESCHNER:
November 6—North Shore Branch, Woman's Auxiliary of the Chicago Medical Society, Chicago.
November 8—George Williams College, Chicago.
November 16—Marion County Tuberculosis Association, Indianapolis.
November 21—West School Parent Teacher Association, Des Plaines, Ill.

DR. NATHAN B. VAN ETEN:
November 11—The Pittsburgh Academy of Medicine, Pittsburgh.

"BOOTLEG" AUTOMOBILE EMBLEMS

Years ago the American Medical Association had copyrighted the design used on the official A. M. A. auto emblem. The design comprised essentially the Aesculapian (knotty) rod entwined by one serpent placed on the center of a green cross, with the letters M.D. beside the rod. The use of this official emblem has been restricted to members of the American Medical Association and thousands of the emblems have been manufactured and distributed in this way to be placed on physicians' cars, sometimes including also the name of the constituent society of which the physician is also a member. Several imitations or bootleg auto emblems have since appeared on the market. The design used by the imitators is different, comprising a straight rod with wings at the top and entwined by two serpents. The bootleg emblem is distributed by unofficial agencies who make no effort to determine that purchasers are physicians. Members of the American Medical Association should beware of imitation emblems. The official auto emblem bears a serial number in the small panel, which is registered at the headquarters of the American Medical Association with the name of the user and thus becomes an authoritative means of establishing one's identity in troublesome traffic situations. Keen observers can readily distinguish between the official emblem and bootleg auto emblems.

WOMAN'S AUXILIARY

ANNUAL MEETINGS

Mrs. Rollo K. Packard, president of the Woman's Auxiliary to the American Medical Association, addressed annual meetings of auxiliaries to the following state medical societies: Kentucky at Bowling Green September 13, Michigan at Grand Rapids September 19, Pennsylvania at Pittsburgh October 2, Virginia at Richmond October 4 and Delaware at Wilmington October 10.

The annual meeting of the auxiliary to the Indiana State Medical Association was held in Fort Wayne October 10-12. Mrs. Maurice B. Van Cleave is the retiring president.

The annual meeting of the auxiliary to the State Medical Society of Wisconsin was held in Milwaukee September 12-14. Dr. Rock Sleyser, President of the American Medical Association, addressed the auxiliary. Mrs. Robert E. Fitzgerald is the retiring president and Mrs. Frank W. Pope is president 1939-1940.

The annual meeting of the auxiliary to the Utah State Medical Association was held in Salt Lake City, September 5-7, during the time of the meeting of the Rocky Mountain

Medical Conference. Speakers at the meeting were: Dr. Claude L. Shields, president of the Utah State Medical Association; Dr. E. M. Neher, chairman of the advisory council to the auxiliary; Dr. J. W. Aird, the oldest physician in the practice of medicine in Utah, and Dr. Edward Jackson, guest speaker from Denver. Mrs. W. M. Stookey, retiring president, presided. Mrs. J. J. Weight, Provo, is president 1939-1940.

Northeast Mississippi Thirteen Counties Auxiliary met in Aberdeen September 12. Mrs. V. B. Philpot is president of this group. Dr. W. H. Anderson, Boonville, president-elect of the Mississippi State Medical Association and editor of the *Mississippi Doctor*, spoke, presenting the objective of the state medical association. The auxiliary will assist the association in its program of securing satisfactory legislation on vital statistics, food and drugs, an antibarbituric acid law and the revision of the mortmain law, which at present forbids bequests of property to orphanages, hospitals, colleges and the like which are related to a church. Mrs. Hugh H. Johnston, president, reports a membership of 312.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

First Full Time Professor of Medicine.—Dr. Raymond L. Gregory, professor of medicine at Howard University College of Medicine, Washington, D. C., has been appointed professor and head of the department of medicine at the University of Arkansas School of Medicine, Little Rock, newspapers report. This is said to be the first full time appointment to the position. Dr. Gregory graduated at the University of Minnesota Medical School in 1929 and has served on the faculties of the medical schools of the University of Iowa and Louisiana University. He has been associated with Howard since 1937. Dr. Silas C. Fulmer has been professor of medicine at the University of Arkansas and acting part time head of the department.

CALIFORNIA

Society News.—The staff of Providence Hospital presented the following program before the Alameda County Medical Association in Oakland October 16: Drs. Philip J. Dick, "Rectal Polyps"; Malcolm B. Hadden, "Russell Traction and Treatment of Fractured Femurs"; Robert S. Peers, "Gout and Arthritis—Differential Diagnosis," and Lester B. Lawrence, "Intraspinal Tumors—Comments on Diagnosis."—At a meeting of the Los Angeles Surgical Society October 13 Drs. Rupert B. Raney spoke on "Complications of Cranioerebral Trauma Benefited by Surgery" and Mark A. Glaser, "A New Regime for Treatment of Head Injuries."—A symposium on sulfanilamide and sulfapyridine was presented before the San Francisco County Medical Society October 10 by Drs. Arthur Haim, Dwight L. Wilbur, Donald A. Dallas, Edward B. Shaw, Thomas E. Gibson and Jesse L. Carr.—The San Mateo County Medical Society was addressed in San Mateo October 25 by Drs. Mayo H. Soley and Paul A. Glielbe, both of San Francisco, on "Physiologic Syndromes Which Simulate Organic Disease."

Railway Surgeons' Meeting.—The thirty-seventh annual convention of the Pacific Association of Railway Surgeons was held at the Cliff Hotel, San Francisco, September 29-30 with the following speakers among others:

- Dr. Lionel D. Prince, San Francisco, A Method of Treatment of Fractures of the Patella.
- Dr. Ralph M. L. Dodson, Portland, Ore., Fractures of the Transverse Processes of the Lumbar Vertebrae.
- Dr. Howard A. Brown, San Francisco, The Neurologic Aspects of Low Back Pain and Sciatica.
- Dr. Leo L. Stanley, San Quentin, Testicular Substance Implantation.
- Dr. Charles R. L. Mathe and Robley C. Archambeault, M.A., San Francisco, Spectrographic Analysis of Urinary Calculi: A Preliminary Report.
- Dr. Edward M. Butt, Los Angeles, Virus Infections.
- Dr. Eugene S. Kilgore, San Francisco, The Management of Coronary Disease in Engineers.
- Dr. Grant L. Selfridge, San Francisco, Deafness.
- Drs. Charles A. Thomas and Shirley C. Davis, both of Tucson, Ariz., Tuberculosis in the Aged.
- Dr. Edmund J. Morrissey, San Francisco, A New Test for Circulatory Disturbances in the Hand.
- Dr. Lloyd B. Crow, San Francisco, Roentgenologic Demonstration.

Dr. Richard J. Flamson Jr., Los Angeles, gave the presidential address on "The Status of the Railway Surgeon."

FLORIDA

East Coast Meeting.—The Florida East Coast Medical Association will hold its annual meeting at Ponte Vedra November 10-11. The speakers will include:

- Dr. Clarence Larimore Perry, Miami, Differential Diagnosis and Treatment of Vulvar Granuloma Inguinale.
- Dr. Claude Anderson, Orlando, Intrathoracic Goiter or Adenoma of the Thyroid.
- Dr. Isaac M. Hay, Melbourne, Endometriosis.
- Dr. Eugene L. Jewett, Orlando, Fractures of the Femur.
- Dr. James C. Nowling, West Palm Beach, Acute Meningitis Caused by Influenza Bacillus.
- Dr. James J. Nugent, Miami, Pyelonephritis—Recent Improvements in Treatment.

A symposium on management of chest tumors will be presented by Drs. Louie M. Limbaugh, Raymond H. King, Wilfred McL. Shaw and Kenneth A. Morris. All are from Jacksonville. Dr. Frank K. Boland, Atlanta, Ga., will be the guest speaker at this meeting.

ILLINOIS

Free Pneumonia Serum and Sulfapyridine.—The state department of health announces that during the current pneumonia season both serum and sulfapyridine will be distributed free. To obtain them, physicians must have specimens from patients tested in approved laboratories for the type of pneumonia involved and must agree to render reports to the department. Deaths occurred at the rate of 94 per thousand among serum-treated patients against 150 per thousand among comparable nonserum-treated patients during the first half of 1939. These two groups were all from a list of 2,100 patients from whom specimens were taken and tested in approved laboratories. The serum and sulfapyridine may be obtained from the centers which have been established throughout the state.

Chicago

Personal.—Miss Ailee H. Miller, Gainesville, Fla., has been appointed director of public health for the Tuberculosis Institute of Chicago and Cook County, succeeding Mrs. Adelaide Ross, resigned.

Koessler Fellowship Awarded.—Dr. James J. Smith, St. Louis University School of Medicine, class of 1937, has been awarded the Jessie Horton Koessler Fellowship of the Institute of Medicine of Chicago. Under the fellowship, which carries a stipend of \$500, Dr. Smith will work with Dr. Andrew C. Ivy at Northwestern University Medical School in research on evacuation of the gallbladder in pregnancy.

Ophthalmology for General Practitioners.—The Illinois Eye and Ear Infirmary announces that a course in refraction and diseases of the eye will be offered during the week of December 4 for general practitioners in towns outside of Cook County and not nearer than 25 miles to an ophthalmologist. The course will be limited to six men and the fee will be \$25. Information may be obtained from the dean of instruction, Illinois Eye and Ear Infirmary, 904 West Adams Street.

Society News.—The Chicago Society of Internal Medicine will be addressed November 27 by Drs. Michael H. Streicher on "Appendicitis—Incidence of Amebiasis in a Clinical Review of 3,407 Cases"; Ralph B. Bettman and Gemma M. Lichtenstein, "Acute Cholecystitis" and Laurence E. Hines, Allen H. Hoover and Edwin C. Graf, "Effect of Sulfanilamide on the Fibrinolytic Activity of Hemolytic Streptococci."—The Chicago Laryngological and Otological Society will be addressed November 6 by Drs. Hans Brunner on "Surgical Repair of Facial Paralysis"; Frank J. Novak Jr., "Giant Follicular Hypertrophy of Nasopharynx," and William A. Smiley, "Subglottic Polyp Following Intratracheal Anesthesia."

Symposium on Nutritional Deficiency.—The Chicago Medical Society will sponsor a symposium on nutritional deficiency at Thorne Hall, Northwestern University Medical School, November 15 with the following speakers: Dr. Tom D. Spies, Cincinnati; Dr. Frederick T. Jung, Smith Freeman, Ph.D., Dr. Warren H. Cole, Chester J. Farmer, A.M., Drs. Arthur F. Abt, Don C. Sutton, John Ashworth, Nathan S. Davis III, Edward D. Allen, Bengt L. K. Hamilton, Howard L. Alt, Charles B. Puestow and Clifford J. Barborka and Franklin C. Bing, Ph.D. The symposium will begin at 9 o'clock in the morning, and in the evening following dinner at the Chicago Woman's Club Dr. Spies will discuss "Vitamin B and Pellagra."

INDIANA

State Medical Election.—Dr. Albert M. Mitchell, Terre Haute, was chosen president-elect of the Indiana State Medical Association at its annual meeting in Fort Wayne October 12. He will take office in January 1941. Dr. Karl R. Ruddell, Indianapolis, will be inducted into the presidency in January 1940. The 1940 session of the association will be held in French Lick.

Society News.—The Fort Wayne Medical Society was addressed recently by Dr. Richard W. Terrill, Fort Wayne, on "Treatment of Foreign Bodies in the Eye."—At a meeting of the Montgomery County Medical Society in Crawfordsville September 21 Dr. George S. Bond, Indianapolis, discussed coronary disease.—Dr. Arthur N. Ferguson, Fort Wayne, spoke on heart disease at a recent meeting of the Whitley County Medical Society in Columbia City.

District Meeting.—The sixty-second semiannual meeting of the Eleventh Indiana Councilor District Medical Association was held at Marion October 18. In the morning Dr. Quitman U. Newell, professor of clinical obstetrics and gynecology, Washington University School of Medicine, St. Louis, conducted a clinic and in the afternoon the following spoke: Drs. Cyrus J. Clark, Indianapolis, "Sulfapyridine and Allied

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Therapy in Treatment of Pneumonia"; Charles L. Wise, Camden, "Is Convalescent Serum of Value?" and Carl P. Huber, Indianapolis, "Recent Trends in the Investigation and Treatment of Sterility." Dr. Newell addressed the banquet session in the evening.

KANSAS

New Health Director for Kansas City.—Dr. Ragnar T. Westman, formerly health officer of Bay County, Mich., has been appointed city health director of Kansas City, succeeding the late Dr. William F. Lunsford. Dr. Westman graduated at the University of Minnesota Medical School, Minneapolis, in 1931. He formerly served as chief quarantine officer of Minneapolis.

Postgraduate Courses.—Two postgraduate courses on obstetrics and pediatrics began in various sections of south central and southeastern Kansas October 23 to continue through November 17. The speakers are Drs. John H. Randall and William F. Mengert, State University of Iowa College of Medicine, Iowa City; Morris Edward Davis and William J. Dieckmann, Department of Medicine of the Division of Biological Sciences, University of Chicago; Mandel L. Spivek of the Children's Memorial Hospital, Chicago, and Julian D. Boyd, associate professor of pediatrics at Iowa.

LOUISIANA

Society News.—At the joint scientific and third quarterly executive meeting of the Orleans Parish Medical Society October 9 Dr. Earl Conway Smith discussed treatment of trichomonas vaginalis vaginitis; Dr. Rufus H. Alldredge, "Fractures of the Humerus," and Dr. Donovan C. Browne, "Gastroscopy—Its Relation to Surgery." All are of New Orleans.

Personal.—Dr. Erasinus D. Fenner, New Orleans, has presented to the library of the school of medicine of Louisiana State University a collection of medical books and journals from his library.—Dr. Edgar Hull, assistant professor of medicine, Louisiana University Medical Center, New Orleans, has been appointed acting head of the department of medicine to succeed the late Dr. George S. Bel.

Dr. Tripoli Appointed Professor.—Dr. Carlo J. Tripoli has been appointed professor of medicine in charge of the department of medicine of the Graduate School of Louisiana State University, New Orleans. A graduate of Tulane University of Louisiana School of Medicine, New Orleans, class of 1929, Dr. Tripoli has been serving on the staff of the state university since 1931; he has been assistant professor of medicine since 1938. He is also chairman of the section on medicine of the state medical society.

MASSACHUSETTS

Dr. Schall to Succeed Dr. Mosher.—Dr. Lcroy A. Schall, instructor in laryngology, Courses for Graduates, Harvard Medical School, Boston, has been promoted to the position of Walter Augustus Lecompte professor of otology and professor of laryngology, succeeding Dr. Harris P. Mosher, who becomes professor emeritus. Dr. Schall graduated at Jefferson Medical College of Philadelphia in 1917. He has served as surgeon in otolaryngology at the Massachusetts Eye and Ear Infirmary; vice chairman of the Section on Laryngology, Otology and Rhinology, American Medical Association, Chicago, 1936-1937, and secretary from 1937 to 1939. Dr. Mosher has for many years been president of the American Board of Otolaryngology. He was chairman of the Section on Laryngology, Otology and Rhinology of the American Medical Association for the year 1932-1933 and president of the American Academy of Ophthalmology and Otolaryngology in 1929.

Clinical Conference on Physical Medicine.—The New England Society of Physical Medicine will hold a clinical conference at the Hotel Kenmore, Boston, November 8-9 with a special session at the Massachusetts Institute of Technology the morning of November 10. The speakers will include:

Dr. Harold E. Himwich, Albany, N. Y., Nitrogen Therapy: Physiologic Aspects in Schizophrenia.
Dr. Charles W. McClure and Isaac R. Jankelson, Boston, Gastroscopy.
Dr. Temple S. Fay, Philadelphia, Observations on Human Refrigeration.
Dr. William H. Schmidt, Philadelphia, Surgical Diathermy.
George R. Harrison, Ph.D., Cambridge, Mass., Modern Physics and the Modern Physician.
Harold E. Edgerton, Sc.D., Cambridge, Seeing the Unseen with Stroboscopic Photography.
Dr. Edward A. Edwards, Boston, and Seibert O. Duntley, Sc.D., Cambridge, The Pigments and Color of Living Human Skin.
Dr. Rebekah Wright, Boston, Hydratic Sedatives.

The program also includes symposiums and demonstrations covering a wide range of subjects in the field of physical

medicine. For the special session at Massachusetts Institute of Technology the lecturers will be: Joseph W. Horton, Sc.D., associate professor of biologic engineering; Arthur C. Hardy, Sc.D., professor of optics and photography; Robley D. Evans, Ph.D., associate professor of physics, and John G. Trump, Sc.D., assistant professor of electrical engineering.

MICHIGAN

Urologists Observe Anniversary.—The Detroit branch of the American Urological Association celebrated its twenty-fifth anniversary October 12. The fifty-one members present inscribed their names on a plaque to be forwarded to Dr. Frederick W. Robbins, formerly of Detroit and now of Pasadena, Calif., who in 1914 secured the charter from the American Urological Association.

MINNESOTA

Pilgrimage in Honor of Doctors Mayo.—In response to the request of many members, the council of the Minnesota State Medical Association sponsored a memorial pilgrimage to Rochester October 27 to pay tribute to Drs. William J. and Charles H. Mayo. Every member of the association was invited to participate in the ceremonies at Plummer Hall in the Mayo Clinic and at Oakwood Cemetery. With Dr. George A. Earl, St. Paul, president of the state medical association, presiding, at the memorial meeting in Plummer Hall Dr. Edward L. Tuohy, Duluth, gave the address entitled "An Expression from the Medical Profession of Minnesota." There followed a procession to the cemetery.

Society News.—The Minnesota Pathological Society was addressed October 12 by Dr. George H. Whipple, Rochester, N. Y., on "Production, Utilization and Significance of Blood Proteins."—Dr. Perrin H. Long, Baltimore, delivered a Mayo Foundation lecture October 10 in Rochester on "Experimental and Clinical Use of Sulfapyridine and Its Sodium Derivative in Treatment of Pneumococcal Infections."—At the seventy-first annual meeting of the Wabasha County Medical Society in Lake City October 5 Dr. Bertram J. Medisema, Rochester, on "Tetanus and Its Prevention"; Robert A. Glabe, Plainview, "Surgical Drainage of the Abdomen," and William E. Bannen, La Crosse, Wis., "Urologic Pathologic Museum."—Dr. Robert M. Burns, St. Paul, discussed "Accidents in Homes and Industries" before the Washington County Medical Society recently.

NEW HAMPSHIRE

Restrict Sale of Vitamin Concentrates.—The state board of health has given notice to "cut-rate stores, department stores, groceries, etc.," that sales of vitamin concentrates will render them liable to prosecution. These drugs fall in the category of potent drugs as defined by law, and hence their sale by other than drugstores is deemed a violation. The concentrates are commonly in the form of small capsules, the contents of which are usually less than 60 minims (4 cc.).

NEW JERSEY

Society News.—Dr. Norman H. Plummer, New York, addressed the Morris County Medical Society, Greystone Park, Morris Plains, October 19 on "Treatment of Pneumonia."—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address the Essex County Medical Society, Newark, November 9 on "American Medicine and the National Government."

NEW YORK

Society News.—Dr. Henricus J. Stander, New York, addressed the Medical Society of the County of Albany October 18 on "General Considerations of the Toxemias of Pregnancy."—Dr. William C. Clarke, Cornwall Bridge, Conn., addressed the Dutchess County Medical Society, Poughkeepsie, October 18 on "History of Surgery for the Past 200 Years, a day plan."—Dr. Milton A. Carvalho, Binghamton, addressed the Broome County Medical Society, Binghamton, October 10 on "Use of the Cystogram in Diagnosis of Placenta Praevia."—At a meeting of the Seneca County Medical Society at Willard October 11 a symposium on arthritis was presented by Drs. Louis M. Lockie, Roscoe D. Severance, Syracuse, and Thomas W. Maloney, Buffalo, Geneva.

Cancer Advisory Committee Appointed.—The state health commissioner, Dr. Edward S. Godfrey Jr., Albany, has appointed an advisory committee to assist the new division of cancer control in outlining policies and make available to it

the specialized knowledge of the members. The committee consists of Drs. Robert S. Cunningham, dean, Albany Medical College, Albany; James Ewing, director, Memorial Hospital, New York; Thomas P. Farmer, Syracuse, chairman of the council committee on public health and education, Medical Society of the State of New York; John J. Morton Jr., surgeon in chief, Strong Memorial Hospital, Rochester, and Francis Carter Wood, professor of cancer research, Columbia University College of Physicians and Surgeons. Dr. Morton L. Levin, New York, has been appointed assistant director of the new division, which has set up headquarters in the New York State Teachers' Association building, Albany. Formation of the division was announced in THE JOURNAL, October 21, page 1575.

New York City

Second Harvey Lecture.—Conrad A. Elvehjem, Ph.D., professor of agricultural chemistry, University of Wisconsin College of Agriculture, Madison, will deliver the second Harvey Society Lecture of the season at the New York Academy of Medicine November 16. Dr. Elvehjem will speak on "The Biological Significance of Nicotinic Acid."

Conference on Convalescent Care.—The New York Academy of Medicine is sponsoring a conference on convalescent care November 9-10. The program will include the following subjects: physiology and psychology of convalescence, relation of chronic disease to convalescence, results of recent research in nutrition with particular reference to the convalescent state, institutional care for various types of patients, psychosomatic factors of convalescence and the socio-economic aspects of convalescent care. In addition to the New York physicians who will present topics for discussion, the following guest speakers will participate: Drs. Oliver H. Perry Pepper and Isidor S. Ravdin, Philadelphia; William S. McCann, Rochester; Waldo E. Nelson, Cincinnati; Levellys F. Barker and G. Canby Robinson, Baltimore. A general meeting will be held Friday evening November 10 at which the speakers will be Dr. I. Ogden Woodruff, E. H. Lewinski Corwin, Ph.D., and Mr. Alfred H. Schoellkopf.

NORTH CAROLINA

Society Adopts Farm Security Program.—The Johnston County Medical Society at a meeting October 10 adopted the Farm Security Administration program for medical care for 1940. The supervisory board will be composed of the president and secretary of the society and one other member appointed each year by the two officers. It was also voted to place *Hygeia* in all county schools at the expense of the society.

Special Society Meeting.—The fifth annual meeting of the North Carolina Eye, Ear, Nose and Throat Society was held in Statesville September 21. The guest speakers were Drs. John J. Shea, Memphis, Tenn., on "Prevention of Complications of the Surgery of Tonsils and Adenoids" and "Management of Fractures of the Facial Bones" and James W. White, New York, "Relation of Ocular Muscles and Refraction." Dr. Albert G. Woodard, Goldsboro, was elected president; Dr. Milton B. Clayton, Statesville, vice president, and Dr. Milton R. Gibson, Raleigh, secretary, reelected.

NORTH DAKOTA

Semiannual Special Society Meeting.—Dr. Lawrence M. Randall, Rochester, Minn., was the guest speaker at the semi-annual meeting of the North Dakota Society of Obstetrics and Gynecology in Grand Forks October 21. His subject was "Some Clinical Phases of Endocrinology." Other speakers were Drs. James F. Hanna, Fargo, on "A Fifteen Year Review of Carcinoma of the Cervix Uteri at St. John's Hospital, Fargo"; John D. Graham, Devils Lake, "Medical Induction of Labor Near Term," and H. Robert Ransom, Grand Forks, "Pyelitis of Pregnancy."

OHIO

Annual Cardiovascular Institute.—The sixth annual cardiovascular institute under the auspices of the Heart Council of Greater Cincinnati, the West Virginia Heart Association and the Academy of Medicine of Cincinnati will be held November 14. The morning session will be at the Cincinnati General Hospital with Dr. William M. Sheppe, Wheeling, W. Va., speaking on "Syphilis of the Heart and Aorta" and Dr. Marion A. Blankenhorn, Cincinnati, "Hypertensive Heart Disease," and discussion by Dr. Timothy Leary, emeritus professor of pathology, bacteriology and medical jurisprudence, Tufts College Medical School, Boston. In the afternoon session at the University of Cincinnati College of Medicine Drs. Oscar B. Biern, Huntington, W. Va., and Johnson McGuire, Cincinnati,

will conduct round table discussions on cardiovascular syphilis. In the evening Dr. Leary will deliver the first Alfred Friedlander Lecture at the Academy of Medicine on "Pathology of Syphilis of the Cardiovascular System."

PENNSYLVANIA

Society News.—Dr. David M. Davis, Philadelphia, spoke before the Lycoming County Medical Society in Williamsport October 13 on urinary infections in females.—Dr. Russell Richardson, Philadelphia, discussed "Advances in the Treatment of Diabetes" before the Cambria County Medical Society, Johnstown, October 12.—Drs. Howard J. Thomas, Greensburg, and Robert C. Johnston, New Kensington, addressed the Westmoreland County Medical Society at the Mountain View Hotel October 25 on "Toxemias of Pregnancy" and "Surgical Headaches" respectively.—Dr. Stanford W. Mulholland, Philadelphia, addressed the Delaware County Medical Society, Chester, October 12 on "Hypertension's Challenge to Urology."

Philadelphia

Society News.—Drs. Michael Scott and Hershel C. Lennon, among others, addressed the Philadelphia Neurological Society October 27 on "Decerebrate Tonic Extensor Convulsions as a Sign of Occlusion of the Basilar Artery."—A panel discussion of "Practical Orthopedics for the Pediatricist" was presented at a meeting of the Philadelphia Pediatric Society October 10 by Drs. DeForest P. Willard, John A. Brooke, Jesse T. Nicholson and John P. Scott.

The "Blockley" Dinner.—The Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital, for many years known as "Blockley," will hold its fifty-third annual dinner at the Bellevue-Stratford Hotel December 5. Dr. William S. Middleton, dean, University of Wisconsin Medical School, Madison, will be the guest of honor and Dr. Arthur C. Morgan, president of the association, will preside. Members who do not receive notices are requested to send their correct addresses to the secretary, Dr. George Wilson, 133 South Thirty-Sixth Street, Philadelphia.

Woman's Hospital to Celebrate Merger.—A day of scientific meetings in celebration of the tenth anniversary of the merger of the Woman's Hospital of Philadelphia and West Philadelphia Hospital for Women will be held December 1 for all who have served as interns and residents at either institution. In the morning Dr. Margaret C. Sturgis will conduct an operative gynecologic clinic and Dr. Mary Hoskins Eashy a cardiac clinic, and Dr. Alberta Peltz will speak on "The Philadelphia Maternal Welfare Committee and Its Work." At the afternoon session the speakers will be Drs. Emily Lois Van Loon on "Bronchoscopy and Esophagoscopy as Related to the General Practitioner"; Emily P. Bacon, "Disorders in the Preschool Child," and Drs. Berta M. Meine and Ursula M. E. Hober, "Obstetric Service of the Woman's Hospital for the Past Ten Years," with demonstration. There will be a dinner in the evening at the Penn Athletic Club at which Dr. Mary R. H. Lewis, medical director of the hospital, will be toastmistress.

Pittsburgh

Society News.—At a meeting of the Allegheny County Medical Society October 17 the speakers were Drs. James W. Stevenson, Mount Lebanon, Pa., on "Bicornate Uterus Associated with Pregnancy"; Joseph W. Hampsey, "Masking of Clinical Picture of Acute Mastoiditis During the Administration of Sulfanilamide"; Alfred B. Sigmann, Bridgeville, "Clinical Study of Treatment, by Intra-Abdominal Lavage with 70 per Cent Alcohol, of Acute Suppurative Peritonitis (Appendicitis)," and Kenneth D. Eskey, "Sulfanilamide in Treatment of Gonorrhea."

VIRGINIA

Society News.—A symposium on pyloric stenosis was presented before the Mid-Tidewater Medical Society at Saluda recently by Drs. Nowell D. Nelms, Mathews; Russell von L. Buxton and William W. Falkner, Newport News; William Lowndes Peple and Charles R. Robins, Richmond.

Personal.—Dr. Leonard H. Denny has resigned as director of the department of public welfare of Portsmouth in order to return to service in the U. S. Navy, it is reported. Dr. Julian T. Miller, retired naval officer, has been appointed to succeed Dr. Denny.—Dr. William D. Tillson, director of the bureau of industrial hygiene, state department of health, since July 1936, has resigned to become medical director of the American Viscose Company, Parkersburg, W. Va.

State Medical Election.—Dr. Walter B. Martin, Norfolk, was named president-elect of the Medical Society of Virginia at the annual meeting in Richmond October 4 and Dr. Hugh

H. Trout, Roanoke, was installed as president. Vice presidents elected were Drs. Karl S. Blackwell, Richmond; Frank A. Farmer, Roanoke, and Philip W. Boyd, Winchester. Miss Agnes V. Edwards, Richmond, was reelected executive secretary-treasurer.

WASHINGTON

State Obstetric Meeting.—Dr. William M. Wilson, Portland, Ore., was the guest speaker at the annual meeting of the Washington State Obstetrical Society in Everett October 7. Dr. Wilson summarized discussions at the morning sessions and delivered two addresses, one at the afternoon session on "Experience with the Newer Endocrine Products" and another at the evening session on "Treatment of Pruritus Vulvae."

Society News.—Dr. Arthur E. Lien, Spokane, addressed the Spokane County Medical Society, Spokane, October 12 on "Nutrition and Its Relation to the Public Health."—The King County Medical Society was addressed October 16 by Drs. David Metheny on "Carcinoma of the Stomach" and Otis F. Lamson, Seattle, "Multiple Primary Carcinoma." Dr. Frank J. Heck, Rochester, Minn., addressed the society October 25 on "Practical Aspects of the Treatment of Anemia." A motion picture was shown on "The Adequate Neurological Examination" by Drs. Laurence Selling and Roger H. Keane, Portland, Ore.

WISCONSIN

Personal.—Dr. Virginia Small, formerly of Nashville, Tenn., has been appointed staff physician of the bureau of maternal and child health of the state board of health.

Changes in State Medical Board.—Dr. Robert E. Flynn, La Crosse, was appointed to the State Board of Medical Examiners by Governor Heil September 13. He succeeds Dr. Cornelius H. Cremer, Cashton. At a recent meeting in Milwaukee Dr. George R. Reay, La Crosse, was elected president of the board and E. C. Murphy, D.O., Eau Claire, was elected secretary.

Society News.—Drs. Ethel C. Dunham of the Children's Bureau, Washington, D. C., and Wyman C. C. Cole, Detroit, addressed the Milwaukee Pediatric Society October 11 on "Organization of the Pediatric and Obstetric Groups in a Campaign to Reduce Neonatal Mortality" and "Cyanosis of the Newborn" respectively.—Dr. Jay Arthur Myers, Minneapolis, addressed the Medical Society of Milwaukee County, Milwaukee, October 13 on "Controlling Tuberculosis in a Community." The meeting was a memorial to the late Dr. Hoyt E. Dearholt, for many years secretary of the Wisconsin Antituberculosis Association. Dr. Gilbert E. Seaman, Winnebago, gave an address on Dr. Dearholt's contributions to medicine and tuberculosis.

PHILIPPINE ISLANDS

University News.—Dr. Antonio G. Sison, dean of the College of Medicine, University of the Philippines, Manila, has been appointed director of the Philippine General Hospital also. The work of the hospital will be coordinated with that of the various units of the medical school, according to the *Journal of the Philippine Islands Medical Association*. President Quezon also authorized the establishment of a graduate school in the medical college in accordance with provisions of a law appropriating money for the purpose.

GENERAL

Ophthalmic Board to Hold One Written Examination.—The American Board of Ophthalmology announces that only one written examination will be held in 1940. This will be in various cities throughout the country March 2. All applications for this examination must be received before January 1 and all applicants must pass a satisfactory written examination before being admitted to the oral examination. Candidates planning to take the next oral examination, which will be in New York June 8-10, 1940, must file their case reports before March 1. The date of the fall examination will be announced later. For application blanks write at once to the secretary of the board, Dr. John Green, 6830 Waterman Avenue, St. Louis.

Medical Fellowships Available.—Fellowships in the medical sciences administered by the medical fellowship board of the National Research Council will be available for the year beginning July 1, 1940. These fellowships are open to citizens of the United States or Canada who have a Ph.D. or an M.D. degree and are intended for recent graduates rather than for persons already established professionally. The fellows will

be appointed at a meeting to be held about March 1 and applications must be filed on or before January 1. For further information address the Secretary, Medical Fellowship Board, National Research Council, 2101 Constitution Avenue, Washington, D. C. Dr. Alfred Blalock, Nashville, Tenn., and Homer W. Smith, D.Sc., New York, have been appointed members of the board.

Ohio Valley Allergists' Meeting.—The Ohio Valley Allergy Society held a meeting in Cincinnati October 28-29. Following a general discussion of "Potassium Chloride Therapy in Allergic Diseases," the speakers were:

Dr. Jonathan Forman, Columbus, Histamine Therapy in Allergic Diseases.

Dr. John H. Mitchell, Columbus, Emphysema—The Importance of the Excursions of the Diaphragm in Estimating Prognosis—Breathing Exercises.

Dr. George E. Rockwell, Cincinnati, Present Status of Tetanus Toxoid—Advisability of Its Use in Immunizing Horse Serum Sensitive Individuals.

Dr. Armand E. Cohen, Louisville, Ky., The Asthma Syndrome Due to Heart Disease.

Dr. Caryle B. Bohner, Indianapolis, Aspirin-Sensitive Asthmatics.

Special Society Elections.—Dr. Waller S. Leathers, Nashville, Tenn., was chosen president-elect of the American Public Health Association at the annual meeting in Pittsburgh October 16-20, and Dr. Edward S. Godfrey Jr., state health officer of New York, Albany, was installed as president. Vice presidents elected were Miss Elizabeth L. Smellie, R.N., chief superintendent of the Victorian Order of Nurses for Canada, Ottawa, Ont.; Dr. Domingo L. Ramos, Fabrica, P. I., and Dr. Wilton L. Halverson, Pasadena, Calif. The 1940 convention will be held in Detroit.—Dr. Everts A. Graham, St. Louis, was chosen president-elect of the American College of Surgeons at its annual session in Philadelphia October 19. Drs. Oliver S. Waugh, Winnipeg, Man., and Albert O. Singleton, Galveston, Texas, were elected vice presidents and Dr. George P. Müller, Philadelphia, was installed as president.

European Journals and the War.—The American Documentation Institute requests that subscribers to European chemical or other scientific journals who do not receive their copies report the matter promptly. The cultural relations committee of the institute hopes to be able to surmount such war obstacles as interrupted transportation, embargoes and censorship, which seriously affected the progress of research during the last war. It is hoped that the principle will be established that materials of research having no relation to war shall continue to pass freely, regardless of the countries of origin or destination. Reports with full details of where subscription was placed and name and address of subscriber, volume, date and number of the last issue received should be addressed to the American Documentation Institute, Bibliofilm Service, U. S. Department of Agriculture Library, Washington, D. C.

Southwestern Medical Association.—The twenty-fifth anniversary postgraduate conference of the Southwestern Medical Association will be held at the Hotel Cortez, El Paso, Texas, November 9-11. The program will consist of general assemblies, clinical and pathologic conferences, motion picture demonstrations and round table luncheons. The speakers will be:

Dr. Fred H. Albee, New York, orthopedic surgery.

Dr. Marye Y. Dabney, Birmingham, gynecology.

Dr. Leo Eloesser, San Francisco, surgery.

Dr. Samuel D. Ingham, Los Angeles, neurology.

Dr. Julius Lempert, New York, otology.

Dr. Charles F. McCuskey, Glendale, Calif., anesthesia.

Dr. Louis H. Newburgh, Ann Arbor, Mich., dietetics.

Dr. Henry M. Winans, Dallas, Texas, medicine.

A special feature of the meeting will be the presentation of a "Medical March of Time" by charter members of the association.

Dana Medal Awarded to Dr. Ellett.—The Leslie Dana Medal, awarded annually by the St. Louis Society for the Blind for "outstanding achievements in the prevention of blindness and the conservation of vision," was presented to Dr. Edward C. Ellett, Memphis, Tenn., at a dinner in St. Louis October 14. The presentation was to be made by Dr. Edward Jackson, Denver, first recipient of the medal in 1925, and another speaker was Mr. Lewis H. Carris, New York, general director of the National Society for the Prevention of Blindness, which cooperates in the selection of the recipient. Dr. Ellett, who is 69 years old, has practiced ophthalmology in Memphis since 1893 and was professor of diseases of the eye at the University of Tennessee College of Medicine from 1906 to 1922. He is a former president of the American Academy of Ophthalmology and Otolaryngology and of the American Ophthalmological Society and chairman of the Section on Ophthalmology of the American Medical Association.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 7, 1939.

A Healthier Nation

It is interesting that the annual report of the Ministry of Health, which of course was compiled before the outbreak of the war, shows that as we enter a period of destruction the health of the nation was never so good. The average weight of school children at the age of 12 has increased by 3 pounds and the average height by half an inch compared with ten years ago. The same tendency was shown in the medical examination of the conscripts, of whom nearly 83 per cent passed as grade 1. The death rate has again fallen and is now 8.5 per thousand of population, the lowest on record, just half what it was in 1901. Infant mortality has a new low record of 53 per thousand births, little more than one third of what it was at the beginning of the century. Maternal mortality in 1938 was less than 3 per thousand births, while only five years ago it was 4.4. The deaths from tuberculosis were again the lowest on record, being only half the number in 1911. But there has been a rise in the cancer mortality, the deaths numbering 68,605, which was 1,600 more than in the previous year.

Great progress has been made in the control of infectious diseases. Environmental diseases, such as cholera, typhus and plague, have almost entirely disappeared and the cases of typhoid have been substantially reduced. But the position is not so satisfactory with regard to diphtheria, of which the number of cases fluctuates from year to year without showing any general decline. There are about 3,000 deaths from typhoid every year. There has been no material decrease in the incidence of influenza, measles and whooping cough, but the death rate from these diseases has considerably declined. Comparison of the deaths per million of population for 1938 with the average for the decade 1921-1930 shows influenza 118 against 369, measles forty against 109, whooping cough twenty-seven against 114. In 1938 only eighteen cases of smallpox were notified, from which there were three deaths, the first since 1934. An exceptionally large number of cases of poliomyelitis, 1,489, were notified, almost twice those of the previous year.

Women Physicians in the Army

Following representations by the British Medical Association, a scheme has been authorized for the employment of women physicians with the army medical services in the war. They will be eligible for employment either as civilian medical practitioners or medical officers attached to the army medical corps with a military status. Civilian medical practitioners will be engaged under the same conditions and rates of remuneration as male practitioners. For the army medical corps they will first be accepted as medical officers with the relative rank of lieutenant but without a commission. They will receive advancement in relative rank as for the medical corps in war. They will wear a uniform to be decided on and will receive the same pay and allowances as for officers of the corps, except that their rations will be four fifths of those given to males (the accepted principle of all women personnel in the army).

Ambulance Trains Under Construction

The British railways are engaged in the construction of a number of ambulance trains for use both at home and overseas. Work has already been completed on several trains and, to enable more to be brought into service rapidly, work on different sections has been entrusted to seven railway work-

shops throughout the country. Each train is fully equipped with cars for traveling staffs of nurses, physicians, kitchens and wards. Casualty evacuation trains have also been built for use in the event of air raids, in order to assist in the distribution of injured civilians throughout the country. The fitting up of the trains includes electric lighting and steam heating and many devices to ensure the comfort of patients.

The Danger of Traction on the Scalp in Placenta Praevia

In 1925 J. A. Willett introduced a method of treating placenta praevia by traction on the fetal scalp with a forceps which he devised. This was applied to the scalp with a wide bite and traction was made by attaching a weight not exceeding 2 pounds. In Great Britain Willett's forceps has been extensively used. At the Section of Obstetrics and Gynecology of the Royal Society of Medicine, Prof. F. J. Browne stated that in a series of 3,103 cases of placenta praevia which he had collected and analyzed from the reports of eleven teaching hospitals it was used in 252 with a maternal mortality of 3.5 per cent and a fetal mortality of 46.4 per cent. The advantages claimed for the forceps are that (1) it can be applied when the os admits only one finger and therefore is too small to allow a foot to be brought down; (2) little internal manipulation is necessary; (3) the fetus is spared the dangers of breach delivery and the fetal mortality is therefore lower than after version. The average fetal mortality under all methods of treatment in this series was 54.2 per cent, so that there seems some justification for the last claim. But Browne has recently had two cases in which the use of the forceps was followed by *Bacillus welchii* infection of mother and fetus.

In the first case a secundipara aged 32 was admitted after losing about half a cupful of blood. She was thirty-two weeks pregnant. The position was left occipito-anterior high above the pelvic brim. A tentative diagnosis of placenta praevia was made and she was treated expectantly, but bleeding recurred three and eight days later and she was examined under anesthesia. The cervix admitted one finger and the placenta was felt to extend to the internal os. The membranes were ruptured and Willett's forceps was applied with a weight of 1½ pounds attached. Two days later labor pains had not begun, the temperature was 102 F. and there was a foul smelling discharge but no further bleeding. Pains began next day, when the temperature was 103 and the pulse 150. A dead fetus was born. It and the placenta were putrid. The mother's condition was so bad that a transfusion was done and B. *welchii* serum was given. Next day crepitations were felt in the abdominal wall and she died on the following morning. The necropsy showed gas bubbles in the rectus muscle and the blood vessels.

The second patient was a primigravida aged 28, admitted for bleeding of one week's duration. She was eight days overdue and the vertex was not engaged. She was treated expectantly, but as slight bleeding continued she was examined under anesthesia after nine days. The os admitted one finger with difficulty and the edge of the placenta was felt 1½ inches above the internal os. The membranes were ruptured and Willett's forceps was applied. Weak pains began and after nine hours the forceps came off spontaneously. Labor progressed slowly and after four days a putrid fetus was born. B. *welchii* serum was given intramuscularly as a prophylactic. The mother recovered. Cultures from the cervix showed B. *welchii*, numerous colon bacilli and a few fecal streptococci. Cultures from the fetal spleen grew B. *welchii*.

Browne pointed out that in applying Willett's forceps a more or less lacerated wound of the fetal scalp is necessarily made. The weight enables the fetal head to compress the placenta, but this compression arrests both the maternal and the fetal

circulation of the placenta, which is liable to kill the fetus and produces ideal conditions for infection by the Welch bacillus—a ragged wound in dead tissues. If the bacillus is present in the vagina or gains access to it, infection and gas gangrene are likely. It has been shown by Hill, of Melbourne, that this bacillus is widely distributed. He found it in the floor dust of labor wards and on the hands of medical attendants after washing and drying. Browne concluded that Willett's forceps should have no place in the treatment of placenta praevia.

PARIS

(From Our Regular Correspondent)

Sept. 27, 1939.

Polypeptides in General Medicine and Psychiatry

Laignel-Lavastine revived the history of polypeptides before the Academy of Medicine by investigating the comparative value of polypeptidemia in blood urea, both in general practice and in psychiatry. Between 1928 and 1934 polypeptides were an object of infatuation among investigators, who now are somewhat disappointed, perhaps because they expected too much. According to Laignel-Lavastine and his collaborator Duguet, loss of interest in polypeptides is hardly reasonable. The sequence of chemical disintegrations which carries albumin to the urea includes polypeptides, intermediate between peptones and the amino acids. The chemical entity of these polypeptides is far from being precisely known. Polypeptides are defined by their precipitations induced by means of trichloroacetate and phosphotungstic acid, and their quite delicate dosage is based on these reactions. Goiffon and Spacey proposed a simpler and precise, though indirect, method, namely measuring the tyrosine content of the blood polypeptides. This is, in fact, quite regular in polypeptides though Fischer obtained some synthetically which did not contain any.

Pierre Duval draws from the dosage with polypeptides prognostications of interest to surgeons, namely that in those with extensive burns and in numerous cancer patients polypeptidemia is elevated.

In general medicine, Fiessinger has shown that hypopolypeptidemia, or at least an increased deamination index, is always high in hepatic insufficiency. A study of sixty cases (forty from the general practice, twenty from psychiatry) indicated to Laignel-Lavastine the same increase of the rate of polypeptidemia in hepatic cases but accompanied with a low azotemia rate. In mental cases, however, the polypeptidemia and azotemia rate is higher than the normal rate. This hyperpolypeptidemia is especially noticeable in senile dementia, confusion amentia, mania and alcoholism; diseases of patients of this class as a rule are accompanied with hepatic insufficiency. Whenever hyperpolypeptidemia is marked (tyrosine index of more than 100 mg.), prognosis is grave. On the other hand, polypeptidemia can shed light on the nature of certain pronounced azotemias (2 Gm. or more). If the polypeptidemia rate is moderately high, azotemia is often transitory and indicates merely renal lesions in their final stage. Claude likewise studied the variations of the polypeptide rate in the cerebrospinal fluid in the course of dementia paralytica and other mental conditions. Generally in catatonia not due to lesions the polypeptidemia rate is variable and does not suggest parallelism with the condition of the liver. In alcoholic psychosis it varies according to the organic condition of the patients. Normal in chronic alcoholic patients, it as well as the deamination index increases in acute or subacute cases. In dementia paralytica the polypeptides of the spinal fluid are probably increased by a disorder of nitrogen metabolism in consequence of brain modifications. No valid diagnostic or prognostic indications can be deduced from these investigations, at least in the field of mental diseases.

Cancerigenic Effect of Leprous Tissue

Professor Peyron, in collaboration with Sister Marie Suzanne, an investigator of leprosy, took from a leper of the mixed type ($N^1 L^2$) portions of a leproma of the jaw and kept it for fifty days in distilled water, where it underwent little change. On the fiftieth day a large quantity of Hansen's bacilli were found giving clear histologic proof of the leprous nature of the tumor. These leprous portions were mixed with an emulsion and injected into the scrotum of four adult rats and into the axillary and inguinal regions of three adult female rats. The female rats manifested no other reaction outside the common reabsorption granuloma. Two of the male rats developed a perceptible tumor in the third month. The first rat had an enormous scrotal tumor encroaching on the abdomen and a pleural metastatic swelling 2.5 cm. in length. The tumor presented all the traits of malignant tumors of the interstitial cells together with significant indications of dedifferentiation, in keeping with its malignant nature manifested by general signs of carcinomatous intoxication. In the second rat, killed before the other, the tumor was still benign but histologically all the more characteristic. No doubt can exist on the causal relation between the injection of leprous tissue and the appearance of the tumors. Spontaneous tumors in the interstitial glands of the testicles are rare. In the large collection of the Croker Institute and among the large number of rat tumors none have been found. Hence Peyron's leprous tissue products are of great interest. They could have been caused only by the bacillus itself or the products of the autolysis of the leproma. Neither of these hypotheses can be considered satisfactory in our present state of knowledge of experimental carcinoma. Nevertheless one can invoke in favor of the former assumption observations of Jensen's sarcoma, the appearance of which was likewise provoked by the injection of acid-resisting bacilli derived from a pseudotuberculosis of the intestine of an ox.

Radiotherapy in Uterocervical Carcinomas

It seems that uterocervical carcinomas are slightly on the increase. At any rate they occupy an important place in the deaths from cancer. Last June at the meeting of the Société de gynécologie obstétrique de Paris Dr. Simone Lacore Laborde set forth the results obtained by radiotherapy in cervical cancers at the Cancer Institute of the Faculty of Medicine of Paris. The classification adopted by the speaker is that of the subcommittee on cancer of the League of Nations and is divided into four stages. In the first stage, lesions are strictly confined to the cervix. In the second stage the parametrium is infiltrated. This stage includes the cancers at the upper part of the vagina. In the third stage, cancerous growth has reached the pelvic region or, rather, the vagina as far as the lower area. Isolated metastases may also be noted. In the fourth stage the cancer infiltration extends more or less to the neighboring organs, the bladder or rectum or it spreads to a greater distance. In the ten years from 1921 to 1932, 813 cervical carcinomas in the four stages were observed at the Institute of Cancer and 592 were treated: forty in the first stage, ninety-two in the second, 284 in the third and 176 in the fourth. Of the 592 patients, 384 were alive and without recidivation at the end of five years, 384 had died in the course of the five years and six had had a recurrence. One hundred and sixty-seven were living and without recidivation after five years. The proportion of cures during the five years varied according to the years between 12 and 37.9 per cent, the average being 28.2 per cent. There was the same difference according to the stages: fifty-seven, or 5 per cent, in the first stage; forty-eight, or 9 per cent, in the second; thirty-one, or 6 per cent, in the third, and only five in the fourth. The therapy employed was based on the combined use of radium and roentgen rays. Radium therapy was performed by means of tubes containing 10 mg. of radium with a filtration equivalent

lent to 1 mm. of platinum. For the roentgen therapy, high voltage was used with a 300, 400 and even 500 kilovolt pressure. Massive irradiation was refrained from because it induced a general shock without yielding better results. Teleradium therapy by means of an apparatus containing 5 Gm. of radium and permitting irradiations at 20 cm. from the level of the skin did not prove superior to classic methods. Technics of irradiation seem to commend themselves in preference to excision. According to Heyman (1927), surgery's record for cures is only 18 per cent on the average. Besides, one must consider the operative risks (from 7 to 9 per cent), whereas the mortality due to roentgen rays does not exceed 3 per cent.

BERLIN

(From Our Regular Correspondent)

Sept. 10, 1939.

The Abuse of Hypnotics

The public health department of the reich has just published information regarding the use of sleep inducing drugs. It has instituted an inquiry in about 250 clinics, hospitals and centers for mental diseases to secure exhaustive data of the extent of the use of these drugs. It plans to propose that all such drugs as well as pain allaying preparations containing barbituric acid derivatives be dispensed only on medical certification. The greatest attention has officially been given to this ever present problem and the impression may have been created that the use of these drugs has declined. However, the information given to the public health department by relatives of sleeping drug addicts, by physicians, by druggists, by medical district associations, by the police, by health bureaus and by administrative authorities has been so copious that the conclusion is inevitable that the use of these drugs is on the increase. Observations have been made that opium addicts, in consequence of the enforcement of antinarcotic measures, now resort to hypnotics, which they can easily obtain since a medical prescription is not necessary. It is also said that the combined action of alcohol and barbituric acid is mutually intensifying. The public health department has information indicating that hypnotics not requiring prescriptions are increasingly ordered in large quantities by individual users. The use of hypnotics also gives rise to a diagnostic problem. Professor Bonhoeffer, psychiatrist in Berlin, reported that within the last decade wrong diagnoses, previously unknown, of brain tumors had become more numerous, owing to the fact that persons with chronic barbituric acid intoxication had concealed the use. He mentioned among deceptive symptoms slowly increasing stupor, speech disturbances, nystagmus and loss of abdominal reflexes. Professor Pohlisch, psychiatrist in Bonn, reported the case of a university professor who was dismissed because of alleged hereditary epilepsy and for whom sterilization was recommended. It was then discovered that the chronic use of hypnotics was the cause of his condition.

Efforts to Use Workers Who Are Chronically Ill

In view of the great demand for workers in Germany it is especially important to examine the possibilities of economic adjustment for those with chronic ailments. Two series of lectures of a postgraduate nature were recently given at the Berlin Academy for Physicians, on the significance of primary symptoms for timely therapy and prophylaxis, especially with reference to workers, and on economic adaptation of workers with chronic ailments. The lectures were intended to supply information to factory physicians and assistant physicians in charge of departments and practicing physicians interested in these questions. Explanations by state secretary Syrup of the economic needs in the four year plan formed the basis of all the lectures. In Germany, not counting Bohemia and Moravia, 40,000,000 persons are employed in industry. In 1936 lack of skilled laborers became noticeable. Reserves of male workers

are no longer available. Replacement of men with women brings with it dangers to their health. It is essential for public welfare that workers be adjusted to the jobs by which they can maintain themselves. Responsibility for this rests largely on physicians, especially factory physicians. The factory physician should inform himself on how workers live, their family conditions and so on, all of which are important factors affecting efficiency. Treatment of sick workers is not his function; however, he may represent the patient's physician in supervising directions given by him. Observations of slight, scarcely measurable pathologic changes, of scarcely noticeable decrease in efficiency and of early recognition of harmful symptoms might constitute valuable information for the maintenance of health of workers. By observing health measures in a factory and the habits of individual workers the factory physician may, like a seismograph, observe every change in the frequency of diseases and accidents and obviate or relieve them by determining the causative factors. He will have to work in close cooperation with the management. Observations of large groups at work and the evaluation of extensive observational data representing an accumulation of more than 350,000 cases may open up a new field of medical territory. The scarcity of qualified labor has made necessary the employment of those physically below par and involves increased obligations for the cooperating and supervising factory physicians.

ECONOMIC EMPLOYMENT

The second series of lectures, on the economic employment of persons with chronic ailments, was supplementary to the first. The care of such persons constitutes a heavy drain on social insurance reserves. To what extent persons with chronic ailments are dependent on social insurance has not been determined statistically. However, the statistics furnished by individual sick funds and state insurance companies in the provinces offer some information. Among those chronically ill are persons with tuberculosis, cancer, cardiac and vasomotor diseases, diabetes, and those with gastric and intestinal disturbances. It is of little value for such persons to be declared by the physician in charge as fit or unfit for work. At present fitness for work is determined by the social insurance physicians, who work in close cooperation with the public health office, the labor department and the practicing physician in the detection of public diseases. The practical operation of such cooperative services is discernible, for example, in the clinic established in Berlin to determine diabetes. At present, 14,300 diabetic persons, including 118 married couples, are served there.

CARE OF EMPLOYEES

Through arrangements, workers who are not entirely unfit physically can do satisfactory work connected with the soil or excavation. Factory workers with circulatory disorders in charge of machines with rotating belts can easily receive injury, though the work is not difficult. The factory physician should be consulted in determining the speed with which work of this kind should be done. Rational arrangement may enable the injured and even persons with amputated limbs to work. In the case of women, often it is not the heavy work, but certain harmful effects like constant vibrations and injuries caused by continued foot manipulations that are significant. These explanations, elaborated by detailed discussions in lectures, show how effort is made to utilize the working ability of every one by exhausting all possible medical knowledge.

Water Requirements of Workers Under Heat Pressure

Dr. Hebestreit expressed himself in the new periodical *Health Guidance of the German People* on the water requirements of workers under heat pressure. Workers who toil under conditions of great heat lose on an average more than a gallon of water during a working day of eight hours. This loss should

be compensated by drinking during work. However, every excess is to be avoided in order not to burden the circulation and to prevent gastric troubles. Above all, beverages taken should not be too hot or too cold, but lukewarm or of the temperature of the room. Beer and mineral waters are not suitable. Coffee should be drunk with the addition of milk. In the stoker rooms of ships, gruel made for example of oats and rice has proved its worth. It slakes the thirst well and supplies the body with salts to replace those lost in perspiration. For that reason gruel is to be recommended to workers under similar heat conditions. In place of black tea, which has no appetizing taste at room temperature, teas of native growth are recommended, such as teas made from blackberry and strawberry leaves or from peppermint. To supply the body with easily absorbable food values during great physical exertion, sugar can be added to the tea; to supplement loss of salts, from 2 to 3 Gm. of salt per quart of beverage can be added without noticeably impairing its taste.

Marriages

PETER A. N. PASTORE, Bluefield, W. Va., to Miss Julia Anna Rourke of Prides Crossing, Mass., at Rochester, Minn., September 14.

CHARLES WESTON WARREN, Upperville, Va., to Miss Geraldine Estelle Mitchell of Winston Salem, N. C., recently.

WILLIAM GREGORY THALMANN JR., Philadelphia, to Miss Sara Carpenter Klopp of Rosemont, Pa., September 30.

FERDINAND E. CHATARD IV, Baltimore, to Miss Constance Bentley Lyon of Purcellville, Va., September 9.

NEEDHAM BRYANT BATEMAN to Miss Florence Estele Stevenson, both of Atlanta, Ga., September 4.

JAMES A. BRADLEY to Mrs. Evelyn Neuling, both of St. Petersburg, Fla., in Tampa, October 1.

FRANKLIN LEROY WILSON, Montreat, N. C., to Miss Eleanor D. Garrett of Miami, Fla., September 7.

ROBERT LEE SANDERS, Columbia, S. C., to Miss Helen Jessa McDowell of Charleston, September 23.

CHARLES E. CONNER, Wenatchee, Wash., to Miss Marthe Irwin of Colorado Springs, July 15.

JOSIAH HARRIS SMITH, Selma, Ala., to Mrs. Gladys Buckmaster Wire at Cincinnati in August.

PERCY F. GUY, Seattle, to Dr. MAY A. BORQUIST of Honolulu, Hawaii, in Portland, July 15.

IRVING W. SALOWITZ, to Miss Dorcas Maric Crook, both of Plymouth, Ill., September 24.

JOE M. VANHAY, New York, to Miss Helen Spangler of Greenville, N. C., September 6.

LEON BLUM, Far Rockaway, N. Y., to Miss Janette Goldstein of Atlanta, Ga., August 8.

J. ELLIOTT ROYER, Oakland, Calif., to Miss Helen Hay of Pasadena, Calif., September 28.

PAUL B. WILSON to Miss Esther Elizabeth Roberts, both of Philadelphia, September 25.

EARL STOUGH TAYLOR to Miss Virginia Hanson, both of New York, September 23.

SIDNEY F. YUGEND, Sigourney, Iowa, to Miss Bertine Hooper of Hartford, September 8.

HARRY D. TRIPP to Miss Elizabeth Kopp, both of Logansport, Ind., September 30.

FREDERICK R. MINNICH to Miss Katherine Callhoun, both of Atlanta, Ga., recently.

WALTER SHRINER, Elgin, Ill., to Miss Ruth Arline Shearer of Aurora, August 26.

WILLIAM S. COLE, Seattle, to Miss Catherine Rutledge of Burlington, August 5.

LEON E. POLLOCK to Miss Jean Berry, both of Spokane, Wash., August 13.

FRANCIS SAUER, Canton, Ohio, to Miss Irma Dotts at Carrollton, August 14.

JOHN B. DYNES to Miss Edna Bradbury, both of Boston, September 22.

Deaths

William Bricker Chamberlin @ Cleveland; Western Reserve University Medical Department, Cleveland, 1900; secretary of the Section on Laryngology, Otology and Rhinology of the American Medical Association from 1918 to 1922 and chairman from 1922 to 1923; clinical professor of otolaryngology at his alma mater and at various times associate clinical professor, assistant clinical professor, associate and instructor in otolaryngology; member, past president and vice president of the American Laryngological Association; member, past president and secretary-treasurer of the American Bronchoscopic Society; past president of the Cleveland Association for the Hard of Hearing and of the Cleveland Academy of Medicine; member of the American Laryngological, Rhinological and Otolological Society; fellow of the American College of Surgeons; on the staff of the University Hospitals of Cleveland; aged 65; died, September 5, in Cleveland Heights of coronary sclerosis and thrombosis.

Arthur Godfrey Fort @ Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1904; past president of the Medical Association of Georgia; member of the American Academy of Ophthalmology and Otolaryngology and the Southeastern Surgical Congress; fellow of the American College of Surgeons; instructor of ophthalmology at the Emory University School of Medicine, 1918-1924; commissioner of health of Irwin and Tifton counties in 1916; served at various times and in various capacities on the staffs of the Piedmont Sanitarium, Wesley Memorial Hospital, Georgia Baptist Hospital, Crawford W. Long Memorial Hospital and the Grady Hospital; aged 61; died, September 15, in the Emory Hospital of myocarditis and pulmonary edema.

Albert Bernard Yudelson @ Chicago; Northwestern University Medical School, Chicago, 1906; associate professor of medical jurisprudence and nervous and mental diseases at his alma mater; member of the Central Neuropsychiatric Association; past president of the Chicago Neurological Society; served during the World War; attending neurologist to the Cook County Hospital and the Wesley Hospital; aged 67; died, August 27, of coronary thrombosis.

John William McIntosh, Burnaby, B. C., Canada; University of Toronto Faculty of Medicine, 1894; formerly medical officer of health of Burnaby and Vancouver; served during the World War with the Canadian Army; from 1916 to 1920, was a member of the provincial legislature; past president of the Canadian Public Health Association; aged 68; died, August 12.

William Garretson Carhart, Fort Lyon, Colo.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1904; served during the World War; instructor of pathology and bacteriology at the University of Missouri, Columbia, from 1904 to 1907; on the staff of the Veterans Administration; aged 65; died, September 17, of coronary occlusion.

Bennett Sheldon Beach @ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staff of the New York Eye and Ear Infirmary; aged 77; died, September 13.

Thomas Edward Parker, Waterbury, Conn.; Yale University School of Medicine, New Haven, 1904; member of the Connecticut State Medical Society; served during the World War; on the staff of St. Mary's Hospital; aged 58; died, August 1, in the New Haven (Conn.) General Hospital of diabetes mellitus and pyelitis.

William A. Zellars, Shaker Heights, Ohio; College of Physicians and Surgeons, Baltimore, 1891; formerly president of the board of education of Freeport, postmaster and member of the county board of education; at one time president of the bank of Freeport; aged 73; died, August 11, in Cleveland of uremia.

David Ernst Matzke, Punxsutawney, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1925; member of the Medical Society of the State of Pennsylvania; served during the World War; on the staff of the Punxsutawney Hospital; aged 40; died in August of acute dilatation of the heart.

Roy George Pfozter @ Buffalo; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1924; associate in medicine, University of Buffalo School of Medicine; fellow of the American College of Physicians; on the staff of the Millard Fillmore Hospital; aged 46; was drowned, August 9.

Cooper Curtice, Beltsville, Md.; Columbian University Medical Department, Washington, D. C., 1888; formerly associated with the Bureau of Animal Industry, U. S. Department of Agriculture; was known for his researches on cattle tick fever; aged 83; died, August 8, of coronary occlusion.

Charles W. Bankes, Middleport, Pa.; College of Physicians and Surgeons, Baltimore, 1881; member of the Medical Society of the State of Pennsylvania; bank president; aged 82; on the associate staff of the Pottsville (Pa.) Hospital, where he died, August 27, of cerebral hemorrhage.

Paul Whiting Woodruff Ⓢ Chatfield, Minn.; State University of Iowa College of Medicine, Iowa City, 1933; formerly resident to the Chicago Lying-in Hospital and Dispensary; aged 34; died, August 16, in a hospital at Winona, Miss., of injuries received in an automobile accident.

John Joseph Shea, San Diego, Calif.; Harvard Medical School, Boston, 1897; member of the California Medical Association; at one time member of the board of health of Beverly, Mass.; aged 70; died, August 19, in the Mercy Hospital of hypertrophy of the prostate and uremia.

Charles A. Duffy Ⓢ Pittsburgh; Georgetown University School of Medicine, Washington, D. C., 1910; fellow of the American College of Surgeons; on the staff of the Southside Hospital; aged 52; died, August 26, in the Buffalo (N. Y.) General Hospital of coronary occlusion.

Walter Algeno Allen Ⓢ Hampstead, N. H.; Dartmouth Medical School, Hanover, 1893; served during the World War; for many years member of the school board and board of health; formerly state senator; aged 70; died, August 23, in the Benson Hospital, Haverhill, Mass.

Leone Franklin La Pierre, Norwich, Conn.; Yale University School of Medicine, New Haven, 1901; member of the Connecticut State Medical Society; for many years on the staff of the William W. Backus Hospital; aged 62; died, August 7, of cerebral hemorrhage.

Hiram Bachelder West, Los Angeles; Dartmouth Medical School, Hanover, N. H., 1900; member of the American Psychiatric Association; on the staff of the Veterans Administration Facility, West Los Angeles; aged 59; died, August 11, of coronary thrombosis.

Edgar Jonas Knapp, Rice Lake, Wis.; Harvard Medical School, Boston, 1892; member of the State Medical Society of Wisconsin; aged 72; died, August 29, in the Veterans Administration Facility, Fort Snelling, Minn., of carcinoma of the duodenum.

John Ludwig Loutfian, Coxsackie, N. Y.; Medico-Chirurgical College of Philadelphia, 1902; member of the Medical Society of the State of New York; village health officer; aged 64; died, August 5, in the Albany (N. Y.) City Hospital.

Caroline Le Monte Rolph Bassmann, Claremore, Okla.; Northwestern University Woman's Medical School, Chicago, 1897; member of the Oklahoma State Medical Association; aged 70; died, September 30, in St. John's Hospital, Tulsa.

Raymond Alexander Turnbull, Elmira, N. Y.; University of Buffalo School of Medicine, 1904; member of the Medical Society of the State of New York; served during the World War; aged 58; died, August 13, in St. Joseph's Hospital.

Edwin C. Bandy, Alabama City, Ala.; Medical College Montezuma University, Bessemer, 1898; member of the Medical Association of the State of Alabama; aged 78; died in September in Gadsden of extensive burns and bronchopneumonia.

Oliver Hines Finnical, Cadiz, Ohio; Starling Medical College, Columbus, 1895; member of the Ohio State Medical Association; aged 67; died, September 9, in the Ohio Valley General Hospital, Wheeling, of cerebral thrombosis.

Franklin J. Cushman Ⓢ Lansing, Mich.; Detroit College of Medicine and Surgery, 1921; member of the American Urological Association; served during the World War; aged 42; died, September 11, of bilateral renal calculus.

James Merlin Fitzgerald Ⓢ Chicago; Jenner Medical College, Chicago, 1908; professor of mental physiology at Bennett Medical College, 1903-1910; aged 69; died, August 16, in San Francisco of carcinoma of the bladder and liver.

Harper Leonidas Crow, Bossier, La.; University of Louisville (Ky.) Medical Department, 1913; served during the World War; aged 53; was killed, September 3, when the truck in which he was driving overturned.

Albert Earl Reed Ⓢ Larned, Kan.; Rush Medical College, Chicago, 1905; secretary of the Pawnee County Medical Society; medical director of the Larned City Hospital; aged 58; died, August 30, of coronary occlusion.

George T. Van Cleve, Malden, Mo.; University of Louisville (Ky.) Medical Department, 1879; member of the Missouri State Medical Association; aged 86; died, August 5, in the Baptist Hospital, Memphis, Tenn.

Fred Raines Morrow Ⓢ Fayetteville, Ark.; Memphis (Tenn.) Hospital Medical College, 1900; served during the World War; on the staff of the City Hospital; aged 68; died, August 15, of coronary embolism.

Frederick Ogle Roman, Washington, D. C.; National University Medical Department, Washington, 1894; member of the Medical Society of the District of Columbia; aged 73; died, August 12, of lymphatic leukemia.

Samuel T. Williams, Waynesburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1896; aged 70; died, August 4, in the Greene County Memorial Hospital of pulmonary edema following fracture of the femur.

Alfred Loomis Sawyer, Fort Fairfield, Maine; Medical School of Maine, Portland, 1907; member of the Maine Medical Association; served during the World War; aged 57; died, August 14, of acute pancreatitis.

Troy England Martin Ⓢ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1934; aged 29; on the staff of the Germantown Hospital, where he died, August 21, of streptococcal pneumonia.

James Edward Rudasill Ⓢ Markham, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; aged 67; died, August 2, in the Western State Hospital, Staunton, of hypertensive heart disease.

Elliott Benald Tobias, San Francisco; College of Physicians and Surgeons of San Francisco, 1921; member of the California Medical Association; aged 40; died, August 2, of coronary occlusion.

Paul Eskeberg, Miami, Fla.; Northwestern University Medical School, Chicago, 1938; member of the Florida Medical Association; aged 28; died, September 3, of chronic myelogenous leukemia.

Benjamin Franklin Hawk, West Palm Beach, Fla.; Columbus Medical College, 1891; aged 72; died, August 15, in the Veterans Administration Facility, Bay Pines, of carcinoma of the prostate.

Alfred Frederick Zittel, Buffalo; University of Buffalo School of Medicine, 1899; member of the Medical Society of the State of New York; aged 67; died, August 28, of carcinoma of the bladder.

Orville DeWitt Wescott, Walla Walla, Wash.; Rush Medical College, Chicago, 1904; on the staff of the Veterans Administration Facility; aged 68; died, August 29, of coronary thrombosis.

Paul Luttinger, New York; University and Bellevue Hospital Medical College, New York, 1911; member of the Medical Society of the State of New York; aged 54; died, August 11, of pneumonia.

George Lee Long, Fresno, Calif.; Hahnemann Medical College, San Francisco, 1886; formerly county health officer and county coroner; aged 81; died, August 12, of coronary occlusion.

John Henry Adams, Crockett, Calif.; College of Physicians and Surgeons of San Francisco, 1911; member of the California Medical Association; aged 51; died, August 16, in Oakland.

David Martin Levine, Detroit; Wayne University College of Medicine, Detroit, 1937; member of the Michigan State Medical Society; aged 28; died, August 7, of acute lymphatic leukemia.

Newton J. Boswell, Decatur, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893; aged 66; died, September 8, of cerebral hemorrhage, arteriosclerosis and hypertension.

J. O. Bickham, Winchester, Ark.; Gate City Medical College, Dallas, Texas, 1903; aged 58; died, August 13, of myocarditis, acute dilatation of the heart, nephritis and hypertension.

Roy Lee Aiguier, Sulphur Springs, Texas; Southern Methodist University Medical Department, Dallas, 1914; served during the World War; aged 50; died, September 3, in Fort Worth.

James G. Robertson, Arrington, Tenn.; University of Tennessee Medical Department, Nashville, 1899; aged 77; died, August 21, in Cedar Hill, of carcinoma of the right side of the jaw.

Samuel A. Benson, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1896; aged 72; died, September 3, in the City Hospital of burns received when his home caught fire.

Thomas Jefferson Bouldin @ St. Johns, Ariz.; Atlanta College of Physicians and Surgeons, 1901; past president of the Apache County Medical Society; aged 61; died in September.

James Henry O'Connor, St. Helena, Calif.; Columbia University College of Physicians and Surgeons, New York, 1899; served during the World War; aged 66; died, August 1.

John Henry Witbeck, Cayuga, N. Y.; Bellevue Hospital Medical College, New York, 1888; for many years health officer; aged 74; died, August 2, of a ruptured gastric ulcer.

Nathaniel Massie McKitterick, Burlington, Iowa; Rush Medical College, Chicago, 1880; formerly member of the state board of health; aged 81; died, August 29, of angina pectoris.

Adelbert D. Bowen, West Lodi, Ohio; Toledo Medical College, 1885; aged 79; died, September 2, in the Mercy Hospital, Tiffin, following an operation for strangulated hernia.

Thad S. Up de Graff @ Pasadena, Calif.; Jefferson Medical College of Philadelphia, 1883; aged 74; died, August 2, in the Collis P. and Howard Huntington Memorial Hospital.

Norbert Vincent Mullin, Weymouth, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; aged 59; died, August 18, in the Weymouth Hospital.

Edward Plotkin, Nashville, Tenn.; College of Physicians and Surgeons, Memphis, 1909; aged 56; died, August 24, in the Nashville General Hospital of cerebral hemorrhage.

Frederick A. York, Navasota, Texas; University of Texas School of Medicine, Galveston, 1898; aged 65; died, August 22, in the Brazos Valley Sanitarium of paralytic ileus.

Robert Fred Zeiss @ New York; University of Texas School of Medicine, Galveston, 1916; member of the American Urological Association; aged 46; died, August 8.

Randolph D. Black, Cedar Grove, W. Va.; University of Nashville (Tenn.) Medical Department, 1903; aged 62; died, September 2, of carcinoma of the lumbar spine.

George William Lawler, Waukesha, Wis.; Milwaukee Medical College, 1908; aged 65; died, August 22, in the Waukesha Municipal Hospital of pneumonia.

Charles H. Davies, Kansas City, Kan.; Jefferson Medical College of Philadelphia, 1877; aged 86; died, September 16, of pernicious anemia and hypostatic pneumonia.

Frank J. Campbell, San Diego, Calif.; Chicago Medical College, 1890; aged 77; died, August 24, in the Mercy Hospital of cerebral hemorrhage and arteriosclerosis.

John H. T. Earhart, Westminster, Md.; University of Maryland School of Medicine, Baltimore, 1888; aged 77; died, September 10, of coronary thrombosis.

Howard Leon Sumner @ Asheville, N. C.; Jefferson Medical College of Philadelphia, 1926; county health officer; aged 37; died, August 16, of heart disease.

William Henry Bennett, Fitchburg, Mass.; New York Homeopathic Medical College and Hospital, 1889; aged 75; died, August 3, of arteriosclerosis.

Allice Grace Charlton Guequierre, Wayne, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1922; aged 45; died, August 6, of carcinoma.

Thomas Raymond Thorn, Los Angeles; University of Texas School of Medicine, Galveston, 1927; aged 35; was killed, August 13, in an airplane accident.

George B. Hunter, Syracuse, N. Y.; Baltimore University School of Medicine, 1897; aged 64; died, August 25, in the University Hospital of pneumonia.

James Frank Hufford, Elrama, Pa.; University of Pittsburgh School of Medicine, 1910; aged 58; died, August 26, of uremia and arteriosclerosis.

Smith L. Bates, Adrian, Mo.; Medical College of Ohio, Cincinnati, 1878; aged 87; died, August 24, in a hospital at Kansas City of pneumonia.

Frank Alonzo Dearborn, Nashua, N. H.; Missouri Medical College, St. Louis, 1884; aged 81; died, August 3, of arteriosclerosis and heart disease.

James Henry Burnett @ Kopperl, Texas; Atlanta (Ga.) Medical College, 1895; aged 67; died, August 22, of hypertension, nephritis and uremia.

Bureau of Investigation

THREE POSTAL FRAUD ORDERS

Durio Cosmetic Company

A CONTINUATION OF THE C. A. WILLIAMS FRAUD IS
DEBARRED FROM THE MAILS

In this department of THE JOURNAL for Feb. 11, 1939, there appeared a brief story about the closing of the mails to the C. A. Williams Company, of McKamie, Ark. The title was a trade name used by two Negroes, C. A. Williams, who was 70 years old and who founded the business in 1929, and Ples L. Lewis, who in 1936 acquired a controlling interest (93 per cent) from Williams.

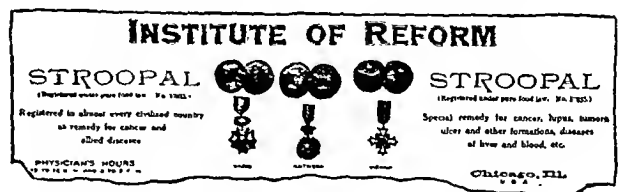
The concern sold a line of nostrums through the mails for the alleged cure of gonorrhea, syphilis, pellagra, paralysis, delayed menstruation, leukorrhea, rheumatism, "lung trouble," and so on. The Post Office authorities showed that the two men who conducted this swindle bought their preparations in gallon bottles from a St. Louis drug firm and then rebottled them into smaller bottles as needed. As the nostrums were quite worthless as cures for conditions for which they were sold, a fraud order was issued Aug. 23, 1938, closing the mails to the C. A. Williams Medicine Company.

But this did not stop the fraud. Williams and Lewis changed the name of their company and continued to do business at the old stand. The "C. A. Williams Company" became "Durio Cosmetic Company" and the sale through the United States mails of worthless swindles for the alleged cure of such diseases as syphilis, gonorrhea and pellagra went on. As a result the Post Office Department on March 3, 1939, issued a supplemental fraud order closing the mails to the Durio Cosmetic Company.

The Stroopal Fraud

A FAKE CANCER "CURE" BOBS UP AGAIN

The Stroopal case presents another example of how some slippery individuals attempt to evade fraud orders debarring them from the use of the United States mails. As long ago as 1930 the Post Office Department declared the Stroopal business of Chicago to be a fraud and closed the mails to this concern. The principal, Alphonse P. Faupel, however, continued



his business in the United States by operating it from London, England. The Post Office authorities, therefore, have found it necessary to issue a supplementary fraud order covering the London address.

The Stroopal cancer cure fraud originated in Germany many years ago with a self-styled "Professor" Stroop. It consists of three powders to be taken at monthly intervals when the moon is new! To the city bred this in itself might appear to arouse suspicion. But there are many otherwise intelligent country people who are still convinced that a calf should be weaned and the potatoes planted at certain phases of the moon. The advertising of Stroopal was declared *verboten* in Germany some years ago and so the headquarters of the fraud were transferred to London, where a greater degree of *laissez faire* was permitted. A Chicago branch was opened and for nearly twenty years the American branch of the fraud was conducted

from that city with agencies in Centralia, Okla., and Seneca, Kan. Most of the American business was directed to Americans of German descent, for much of the advertising was printed in German script.

According to Gehe's Codex (January 1913) Stroopal was nothing more marvelous than the powdered leaves of water germander or wood garlic (*Teucrium scordium*). In August 1930 the Post Office Department issued a fraud order barring Stroopal from the United States mails. The department brought out at the time that in the exploitation of Stroopal medals and "certificates of merit" were featured in the advertising and the claim was made that the product had been awarded these medals and certificates at exhibitions at Antwerp, Brussels and Paris. They were all utter fakes! It was shown, too, that when the importation of Stroopal was barred as dangerous to the health of the people the stuff was for a while smuggled into this country as "metal cleaning powder."

The scheme, and the government's action against it, were dealt with in an article in this department of *THE JOURNAL* for Oct. 4, 1930, and the matter in a condensed form appears in the book "Nostrums and Quackery and Pseudo-Medicine," volume III, published by the American Medical Association. Now, in 1939, the fraud again engages the attention of the United States Post Office Department. The Faupel quack was still selling his stuff to such victims as he could get in the United States from his office in London, England. As a result the fraud order issued in 1930 was supplemented by another issued March 6, 1939, closing the United States mails to the Stroopal Company and to Alphonse P. Faupel, both of London. All postmasters authorized to dispatch letter mail to England have been notified to return all letters addressed to the Stroopal concern to the senders with the word "Fraudulent" stamped plainly on the envelop. Also postmasters are warned not to issue any postal money orders payable to the Stroopal concern.

A Maté Fakery

PEREZ-MATÉ COMPANY OF BROOKLYN DEBARRED
FROM THE MAILS

During the past few years attempts have been made to popularize in this country the South American beverage maté, also known as Paraguay tea. Yerba maté, while having a different flavor from that of the ordinary India or China teas of commerce, has the same physiologic effect. Like common tea it contains variable amounts of caffeine and tannin. To the average American palate maté seems to have a medicine-like taste and therefore it is not surprising that some of the promoters, finding it a poor seller as a beverage, endowed it with "patent medicine" qualities. As a pepper-up for weak men and frigid women it was apparently more of an economic success.

From Brooklyn one Arthur Koppel, using the trade style Perez-Maté Company, for about eight years put out maté under the names "Ola Maté," "Brazilian Maté" and "Para-Brazilian Maté." It was sold through the mails and the fraud order arm of the Post Office Department finally got around to it. According to the memorandum that Judge Vincent M. Miles, Solicitor for that department, sent to the Postmaster General, recommending the issuance of a fraud order, Koppel bought his Paraguay tea in bulk at 10½ cents a pound, repacked it and sold it for \$2 a pound. According to Koppel's advertising, said Solicitor Miles, all users of his brand of maté would "enjoy real health, he-man virility, pep and strength" and "weak men" who took it would have virile sex-power restored "almost overnight." Koppel also claimed that his maté would restore all persons using it to good health but he advised a Post Office inspector that he (Koppel) was unable to leave his house because of ill health!

Despite Koppel's claim that he had discontinued advertising his maté product, Solicitor Miles's memorandum stated that there was evidence that Koppel had recently sent literature on it to persons who inquired about a perfume that Koppel advertised under the name of the He-Mo Company. On March 21, 1939, the Postmaster General, acting on Judge Miles's recommendation, issued a fraud order against Koppel's Perez-Maté Company of Brooklyn and its officers and agents as such.

Correspondence

"DOG BITES AND RABIES"

To the Editor:—Your remarks on "Dog Bites and Rabies" (*THE JOURNAL*, October 7, p. 1434) is a fine example of how one mistake often leads to another.

Cabot in 1899 reported that he saved 91 per cent of the guinea pigs cauterized with nitric acid at the end of twenty-four hours. Rosenau more recently has reported practically 100 per cent of guinea pigs saved by prompt application of nitric acid. In my experience wounds treated with nitric acid heal satisfactorily, and I have never seen one become infected. I believe that the theory that the use of nitric acid causes the spread of infection is not borne out by clinical experience.

Cases of paralysis, some of which have ended fatally following the Pasteur treatment, have been reported in the literature. It should be pointed out that practically all veterinarians who treat rabies have discontinued the use of material prepared by the Pasteur method and are now using material prepared by the Semple method. Since they have so much more experience in treating rabies than do physicians, I believe that their experience should be given consideration. One is forced at least to bring out the fact that vaccine prepared by the Semple method is evidently safer, and the dosage can be more varied according to the clinical indications because one is using a killed rather than an attenuated virus.

L. B. GLOYNE, M.D., Kansas City, Kan.

From the Department of Preventive Medicine,
University of Kansas School of Medicine.

[COMMENT.—In *Queries and Minor Notes* (this issue, p. 1754) appears an additional discussion of paralysis following rabies vaccination.]

BLOOD SUGAR VERSUS URINARY SUGAR

To the Editor:—In *THE JOURNAL* June 17 and 24 appears a paper entitled "Blood Sugar versus Urinary Sugar" by Dr. Anthony Sindoni Jr. The author states that:

In view of the high incidence of disturbed carbohydrate metabolism frequently escaping detection by examination of the urine for sugar and the serious consequences resulting therefrom, blood sugar estimations, fasting and after meals, should be indispensable in early and latent recognition of the blood sugar disturbances:

- (a) They should be the governing factor in guiding the insulin dose and diabetic treatment.
- (b) Control of the hyperglycemia, not the glycosuria, should be the paramount aim of diabetic treatment.

The estimation of blood sugar levels is indispensable in the recognition of early and latent diabetes, but once the diagnosis has been made there is a question as to the relative value of blood sugar determinations. Diabetes mellitus is a metabolic disturbance not only of carbohydrates but also of proteins and fats, and in evaluating blood sugar levels one must be cognizant of the following points:

1. The glycogenetic and glycogenolytic mechanism of the liver. In diabetes mellitus the glycogenolytic mechanism in particular plays an exaggerated role.
2. That hypoglycemia affects glycogenolysis in the liver. This is an attempt to restore the blood sugar to its former level. Overstimulation of this glycogenolytic mechanism results frequently in hyperglycemia and glycosuria. "Hypoglycemia begets hyperglycemia" (Somogyi).
3. That glycogen is always removed from the liver during periods of hypoglycemia (Cori).
4. That glycogen can be stored in the liver only when the blood sugar level is augmented (Cori).
5. That ketone bodies are formed chiefly in the liver only when glycogen stores of the liver are depleted.

6. That there is a relative constancy of the respiratory quotient of well regulated diabetic patients although there is a wide fluctuation of blood sugars during the twenty-four hour period (Bridge and Winters).

Thus the mechanism that controls the rates of glycogenesis and glycogenolysis must be stabilized to avoid periods of hypoglycemia leading to glycogen depletion in the liver and ketosis. The latter is frequently followed by periods of hyperglycemia and glycosuria. Blood sugar levels within the so-called normal range may represent true hypoglycemic levels for diabetic patients. Hypoglycemic shock has been observed in diabetic patients with sugar content of the blood as high as from 120 to 180 mg. per hundred cubic centimeters of blood (Grafe). This same observation has been made by Mann and Magath in experimental depancreatized hepatectomized dogs.

While the harmful effects of hypoglycemia have been repeatedly demonstrated, those of hyperglycemia without ketosis are highly theoretical. In the management of diabetic patients it is advisable to adjust their diets and dosage of insulin so that a slight trace of glycosuria is maintained throughout the day, thus avoiding the possibility of hypoglycemia consistently. In this day of high carbohydrate diets it is felt that if the diabetic patient constantly utilizes a minimum of 90 per cent of the ingested carbohydrate he is in constant positive carbohydrate balance and is in no danger of ketosis. The respiratory quotients in these patients are high and approach the normal. It is felt that if any one factor is of prime importance in the welfare and management of the diabetic patient it is the state of liver glycogen, and no true indication of the state of liver glycogen can be obtained from blood sugar estimations in diabetes mellitus.

ZOLTON T. WIRTSCHAFTER, M.D., Cleveland.

"DENTAL CARIES AND DOMESTIC WATER SUPPLIES"

To the Editor:—I was much pleased with and interested in the editorial "Dental Caries and Domestic Water Supplies" (THE JOURNAL, September 16, p. 1132). I have had occasion to watch your part in this story of the relation of fluorine to dental conditions.

Only recently I have been shown "An Address on Tooth Culture" by Sir James Crichton-Browne in the *Lancet* of July 2, 1892. On page 7 is a paragraph discussing fluorine and dental caries in which he advises a supply of fluorine for child-bearing women so as to "fortify the teeth of the next generation." An enthusiastic follow-up on Sir James's suggestion at that time might have yielded some human experimental evidence of the causes of mottled enamel, so it is perhaps fortunate that such an application was not then made.

In your own columns may be found at least three items on fluorine and its relation to dental caries, one in the editorial columns Nov. 7, 1931, page 1389, and two in *Queries and Minor Notes*, Jan. 27, 1934, page 315, and June 9, 1934, page 1964.

An important paper which has received little attention is that of W. D. Armstrong and P. J. Brekhuis entitled "Possible Relationship Between the Fluorine Content of Enamel and Resistance to Dental Caries" (*J. Dent. Research* 17:393 [Oct.] 1938). Their analytic data are evidence from an entirely different angle of the relation of fluorine to dental caries.

My associates and I have experimental evidence contained in a paper to be published in the *Journal of Dental Research* that fluorine added to the diet of pregnant rats results in increased caries resistance in the young. This is an experimental approach which shows that fluorine is responsible for the increased resistance to caries, as it was the sole variable in our procedure. Our work on fluorine has been mentioned in the last three annual reports of the director of the Mellon Institute published in the "News Edition" of *Industrial and Engineering Chemistry*.

It seems therefore that, with three different lines of evidence of this beneficent dental effect of fluorine, namely the Galesburg-Quincy survey of Dean and his associates, the analytic data of Armstrong and Brekhuis and our experimental evidence, the case should be regarded as proved.

GERALD J. COX, PH.D., Pittsburgh.

Senior Fellow, Mellon Institute of Industrial Research, University of Pittsburgh.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PLEURAL PAIN AND PNEUMOTHORAX

To the Editor:—A man aged 32 has had artificial pneumothorax treatment of the right lung for the past six years. Previous to collapse therapy he had a pulmonary hemorrhage, the sputum was positive for tubercle bacilli and x-ray studies showed evidence of a moderately advanced lesion at the right lung with no apparent cavities. A short time after artificial pneumothorax was established, fever and cough subsided and the sputum became normal, as it has continued up to the present. Since a supplementary year of rest, the patient has been engaged in a suitable occupation. About six months after institution of pneumothorax, approximately a pint of pleural effusion developed, reaching to the fifth rib anteriorly. The fluid was not removed and remained in the pleural cavity for two years, when it suddenly absorbed, leaving x-ray evidence of "fibrin bodies" at the base of the thorax. The lesion in the lung is apparently healed, and at present and for several years there have been no indications of activity. However, there is this difficulty: If the patient does not have a refill every ten days, the pleural surfaces, which are apparently thickened, rub together and produce a mechanical pleuritis, which causes the temperature to rise as high as 100 or 101 F., with nausea and general malaise, the lung being in approximately 60 to 70 per cent collapse according to fluoroscopic and x-ray examinations. After a refill of from 400 to 500 cc. of air the fever subsides together with the pleural rubbing, and in a day or two all symptoms are gone. The patient is anxious to discontinue pneumothorax treatments because they are no longer needed to control the tuberculosis, but the complication mentioned prevents this. Can any procedures be instituted to alleviate this complication? Are there any studies in the literature on this phase of pneumothorax? What would you suggest as a possible way of discontinuing collapse without having these symptoms? Is it possible that fluid would develop and cause subsidence of symptoms, with eventual absorption permitting reexpansion of the lung? Would a nonirritating oil in small amount such as is used in oleothorax lubricate the pleural surfaces and thus prevent the pleural friction? Any suggestions or references will be greatly appreciated.

M.D., Pennsylvania.

ANSWER.—From the statements made it is assumed that friction rubs can be elicited over some part of the chest while the lung is still collapsed to 60 or 70 per cent of its volume. Thus it is assumed that the visceral and the parietal pleura are coming in contact at one or more points. After pleurisy with effusion, it seems probable that the pleura contains tuberculous lesions which cause no symptom as long as the lung is under a fairly complete state of collapse. The lesions may be anywhere over the surface of the pleura; that is, they are not necessarily limited to the area over the pulmonary disease. The mechanical effect of the two layers rubbing together in the region of pleural lesions may be sufficient to cause the symptoms. Again, the reexpansion of the lung to 60 or 70 per cent of its volume may result in enough stretching of the visceral pleura to reactivate lesions in it, even though it is not in contact with the chest wall. In fact, too rapid stretching of the pleura in reexpansion may cause its rupture. The pulmonary lesion may also be reactivated by expansion if it is not sufficiently fibrosed.

It is possible that reducing the amount of air of the ten day refills to 100 or 200 cc. might allow the lung to expand more gradually and thus prevent the symptoms, as this amount would be sufficient to reduce the negative intrapleural pressure. If this does not suffice, temporary interruption of the right phrenic nerve so as to paralyze and elevate the diaphragm, thus reducing the size of the pleural cavity, might be given a trial. Following temporary interruption, the nerve fibers regenerate in approximately three months. If this procedure aids in preventing the symptoms, it could be repeated one or more times if necessary, while the lung is being expanded.

The introduction of sterile olive oil or liquid petrolatum up to 100 or 200 cc. might suffice while the lung is reexpanding. Oil has a strong tendency to cause thickening of the pleura since

it is a mild irritant, and therefore it should not be left in the pleural cavity more than a few months at a time. In some cases it causes so much change in the visceral pleura that it becomes impossible for the lung ever to reexpand.

There is the possibility that fluid will form again if the symptoms are permitted to continue, that is, if no air is introduced. In some such cases empyema develops; therefore it would seem safer to employ the procedures outlined.

If from these various procedures no relief from symptoms is experienced as the lung reexpands, it is probably safer to keep the lung collapsed by pneumothorax to the point just below the appearance of symptoms over a longer period, so that in case there are still lesions in the pleura, which are easily activated, they will be given a better opportunity to come under control.

EAGLE FLOCCULATION TEST

To the Editor:—Will you please send me information about the Eagle flocculation test for syphilis: 1. What is its present standing as an authoritative laboratory test? 2. In what respects is it superior to the Kahn test on (a) untreated and on (b) treated patients? 3. In what physical conditions are false positive reactions likely to be found? 4. Do you advise its substitution for the Kahn test or its use as a check on the Kahn test in a laboratory which employs no pathologist?

M.D. Florida.

ANSWER.—1. The Eagle flocculation test has been designated by the American Serologic Committee as a reliable laboratory procedure for the detection of syphilis.

2. With regard to treated and untreated syphilis, it is impossible at the present time to discuss the superiority of either the Eagle flocculation or the Kahn precipitation test, principally because of the small number of cases on which an authoritative evaluation has been made from this standpoint. Studies thus far, however, seem to give the two tests an approximately equal rating.

3. From the evaluation studies conducted in cooperation with the United States Public Health Service in 1935, and in the experience of various serologists, it has become recognized that flocculation tests in general may give appreciable numbers of false positive results in leprosy, yaws and malaria. In occasional instances false positive results may be encountered in tuberculosis, relapsing fever, infectious mononucleosis, gonococci, pneumococci and streptococci infections, jaundice and malignant conditions and rarely even in a person without recognizable disease.

4. Since the evaluation studies of the United States Public Health Service reveal that both the Eagle and Kahn tests are efficient procedures for the detection of syphilis from the standpoint of sensitivity and specificity when performed in reliable laboratories by properly trained technicians, there should be no valid reason for substituting either test for the other. To use the one procedure as an intralaboratory check on the other, however, obviously would be of merit.

PARALYSIS AFTER RABIES VACCINE

To the Editor:—Please give me symptoms, prognosis and treatment of a condition called peripheral paralysis caused by the use of rabies vaccine. All I can find in Meakin's Practice of Medicine is "There is no proven explanation for such, and they are principally of an academic interest." It happens once in 5,000 inoculations. However, it is important from the patient's point of view.

E. M. Ling, M.D., Hemlock, Mich.

ANSWER.—The latest figures on the occurrence of postvaccinal paralysis from the *Bulletin of the Health Organization of the League of Nations* showed the frequency of paralysis in patients receiving Pasteur antirabic treatment to be thirteen among 121,000 treatments, or one in 10,729. For the entire eight reviews the proportion of accidents has been one in 5,441, or 139 out of 756,000 treatments. It is now readily apparent that killed phenol, heated, and killed ether methods of preparing the vaccine are alike satisfactory regarding the incidence of accident. Nearly all patients have been adults. Two thirds had the onset during treatment and one third soon after its termination. The time of onset has been from eleven to thirty days after the bite for which the treatment was given. This is a much shorter period of incubation than that for rabies. The incubation period of the latter is usually from forty to sixty days. Three clinical types may be distinguished:

Type 1, acute ascending paralysis of Landry. The onset is sudden, with fever, headache, vomiting, severe backache, insomnia and restlessness. The following day the legs are weak and in one or two more days the paralysis is apt to be complete. The sphincters are also paralyzed. Pain, which is usually present in the back, extends upward into the neck and chest, and then the arms become paralyzed. This is followed by pains

in the face and paralysis of the throat (bulbar) and face. The prognosis in this type is grave because of bulbar paralysis (respiratory and circulatory arrest). The mortality is about 30 to 40 per cent.

Type 2, dorsolumbar myelitis. The onset is gradual and the fever at first is slight. The legs become completely paralyzed and anesthetic. The sphincters are also involved. The tendon reflexes are lost but occasionally there is a Babinski sign. There are no bulbar signs. Recovery usually occurs in the course of several weeks unless bed sores and urinary tract infection result in lowering the resistance and causing death by sepsis.

Type 3, neuritic form. After a brief febrile period one or more peripheral nerves become involved and cause paralysis. The facial nerve is by far the most frequently concerned. The facial paralysis may be unilateral or bilateral. Other nerves that may become affected are the oculomotor, vagus, radial, ulnar and sciatic. Rapid recovery is usually the rule. The treatment is essentially that of any acute infection, with absolute rest, forcing of liquids and aseptic care to bed sores and urinary abnormalities. The neuritic forms may be treated with local massage and galvanic current after the period of acute involvement. This usually occurs after the second or third week when the temperature is normal. The patient should be placed on an air or water mattress. Foot and wrist drops should have proper immobilization. Vitamins B₁, B₂ and C should be given.

At the present time the various types of paralysis following administration of antirabies vaccine are supposed to be due to the vaccine itself and not to be original rabic infection.

FORDYCE'S DISEASE OF THE VULVA

To the Editor:—A young unmarried woman complained of itching of the labia minora. On examination I found a series of closely packed, pin-head size, light yellow papular lesions. The picture to a certain degree resembles Fordyce's disease of the mouth in that it consists of innumerable tiny faintly yellow lesions. There is a certain amount of itch, but it is not intolerable. There is no history in this case of syphilis, diabetes, *Trichomonas vaginalis*, gonorrhea, masturbation, contraceptives or the local application of irritating ointments. It is the first time that I have ever seen this condition and for all I know it may be common, but I would greatly appreciate your opinion as to the diagnosis.

William J. Macdonald, M.D., Boston.

ANSWER.—It is probable that this young woman does, indeed, have Fordyce's disease of the vulvar mucous membrane. Fordyce's disease may occur in this situation as well as in the mucous membrane of the lips and mouth. A noninflammatory dermatosis consisting of yellow, discrete puncta on the vulvar mucous membrane and in the mouth would not ordinarily fit in with any other entity. A peculiar type of localized xanthomatosis might be considered, but its presence is not likely. Of course, a biopsy would settle the question. Histologically, masses composed of cells resembling those found in sebaceous glands are found in Fordyce's disease.

Fordyce's disease is devoid of symptoms, the lesions generally being found accidentally. In consequence, the itching present must be accounted for on some other grounds. A moderate amount of pruritus of the vulva and anus is not rare, the causes of which are diverse. Some of these, such as *Trichomonas vaginalis*, the inquirer has not found present. It is assumed that no local cause for the itching can be found; otherwise that should be corrected.

Pruritus vulvae at the menopause and later may be due to changes in the secretions of the endocrine glands. A general examination should be made to rule out such possible causes as diabetes or nephritis.

If no disease process can be found to account for the itching, local measures may be used for symptomatic relief of the itching. Nothing need be done for the Fordyce's disease. Application of an antipruritic lotion, oil or ointment is indicated. The usual antipruritics are used, such as phenol, menthol and camphor-chloral. These may be employed in somewhat higher concentration than when their general application is required. Applications of moist dressings of water as hot as can be borne may at times tide one over an itching crisis. Painting with a 10 per cent aqueous solution of silver nitrate may be done once or twice a week. The most effective nonspecific agent for vulvar pruritus is the x-ray. Great care should be used not to go beyond a tolerance dose for fear of inducing a radiodermatitis. One fourth of a unit once a week for several weeks is sufficient in many cases. Some recommend local injection of such materials as alcohol and quinine and urca hydrochloride. These measures are seldom indicated and may prove dangerous. A certain experience with them is required. In exceptional cases surgical measures have been employed, but most observers are not in favor of them.

UREA AS DIURETIC

To the Editor:—I would appreciate any information that you may be able to give me as to the use of urea for elimination in cordiae decomposition.

H. S. Rosenberg, M.D., Franklin Square, L. I., N. Y.

ANSWER.—The use of urea as a diuretic in cardiac insufficiency as well as in renal disease was established about twenty years ago in German clinics. The first careful clinical study in the United States was reported in 1925 (Crawford, J. H., and McIntosh, J. F.: *Arch. Int. Med.* 36:530 [Oct.] 1925). Since then urea has achieved only moderate popularity as a diuretic and in recent years has been largely displaced by the organic mercurials and acid-forming salts. The reasons for this are the limited diuretic effect of urea and its unpleasant taste. The mechanism of its action was recently discussed in *Queries and Minor Notes* (Urea as Diuretic, *THE JOURNAL*, June 4, 1938, p. 1945).

It is necessary to give from 30 to 60 Gm. of urea daily to produce diuresis. The 40 or 50 per cent aqueous solution may be diluted with an equal volume of some fruit syrup or taken in carbonated water, beer, tomato juice, coffee or tea. The daily dose is best divided into three portions, given after meals. The salt and fluid intake should be limited in order to favor the removal of edema fluid by the osmotic action of the extra urea. Since urea can readily be ingested as a 20 per cent solution but concentrated by the kidney to only 4 per cent as a maximum, diuresis will occur provided renal function is unimpaired. That urea has no deleterious effect even when taken daily for months or years has been fully demonstrated (Miller, H. R., and Feldman, A.: *Arch. Int. Med.* 49:964 [June] 1932). It may be advantageous to combine the administration of urea with the use of other diuretics, such as the organic mercurials. Urea is especially helped in preventing the recurrence of cardiac edema after the original dropsy has been controlled by rest, digitalization and ordinary diuretic management. For this purpose a dose of from 15 to 30 Gm. a day may be sufficient. In general, the use of urea will be determined by the patient's gastrointestinal tolerance for the drug.

COCONUT MILK AND DIABETES

To the Editor:—Can you give me any information regarding the value of coconut milk in the treatment of diabetes mellitus or refer me to the literature on the subject?

M.D., New Jersey.

ANSWER.—The composition of coconuts and coconut milk is as follows:

	Carbohydrate, per Cent	Protein, per Cent	Fat, per Cent	Calories per 100 Gm.
Coconuts	27.9	5.7	50.6	590
Coconut milk	4.6	0.4	1.5	34

As may be seen, coconuts are rich in fat and high in calories despite a relatively low carbohydrate content. Coconut milk is low in carbohydrate and in calories. These facts may be responsible for a reputed value of these foods in diabetes. No other information on the subject has been found.

Reference:

Joslin, E. P.: *Treatment of Diabetes Mellitus*, Philadelphia, Lea & Febiger, 1937, p. 681.

LEAD CONTENT OF CRAYON CHALK

To the Editor:—Recently there have been articles commenting on lead poisoning resulting from the use of chalk containing lead chromate. In this connection some of the crayon companies state that their chalk is nontoxic. Have you any data proving whether or not chalk may have small amounts of lead and still be nontoxic? As I understand lead poisoning, lead is cumulative. Therefore a person exposed to lead, either by inhaling dust or by nibbling chalk containing lead even though in small amounts, would possibly be accumulating enough lead actually to cause poisoning. The points that I would like to have answered are: What amount of lead in chalk would be toxic, or would chalk have to be absolutely free of lead to be considered nontoxic?

Malvin J. Nydahl, M.D., Minneapolis.

ANSWER.—In 1937, C. M. Jephcott (Lead in Certain Coloured Chalks and the Danger to Children, *Canad. Pub. Health J.* 28:391 [Aug.] 1937) reported finding high concentrations of lead chromate in yellow, orange and green crayons but no lead in other colored chalks. Chalks recently analyzed by the Massachusetts State Division of Occupational Hygiene, under the direction of Manfred Bowditch, were found to contain between 2.2 and 18.7 per cent of lead. These high percentage chalks would seem to be definitely undesirable for children to use, particularly because of the dust which they produce. Crayon manufacturers are now cognizant of this risk, and it is believed that this high lead content already has been eliminated from some colored chalks. One cannot say exactly how much lead would be permissible in that chalk. The factor of importance is the amount of lead present in the air which is

breathed. A larger percentage of lead in chalk would be safe if blackboards were cleaned with water rather than with the dust-producing eraser. The usual safe limit of daily lead absorption is stated to be about 2 mg. a day in breathed air. Somewhat larger amounts could be taken by mouth without deleterious effects. Therefore chalk would not have to be absolutely free of lead to be considered nontoxic, but it ought not contain a large percentage of lead. Certainly the high percentage now found in some chalk should be reduced, no matter what chemical compound of lead is employed.

EFFECT OF SULFANILAMIDE ON GONOCOCCI

To the Editor:—It has repeatedly been stated that the use of sulfanilamide in the treatment of gonococcal infections may alter the morphology appearance of the gonococcus. A detailed report of the changed appearance of the sulfanilamidized gonococcus as observed microscopically would be appreciated.

Heinrich Lomm, M.D., La Feria, Texas.

ANSWER.—Under sulfanilamide therapy the slide characteristics of both gonococci and secondary organisms become unusually irregular. Size, shape, relationship to pus and epithelial cells and to a lesser extent staining characteristics change. The organisms may become unrecognizable and confused with one another. There are more extracellular organisms and the pus cells confusingly contain what may be a single organism or pair of organisms, a fragment of nuclear material or merely debris. The gram-negative short coliform bacilli in the early division stage can easily pass for gonococci. They may be intracellular.

The most reliable diagnostic criteria are cultural. Atypical gonococci always revert to type when implanted on suitable soil, whether it is a laboratory medium or the urogenital epithelium.

POSSIBLE SCIATIC OR PERINEAL HERNIA

To the Editor:—Please suggest possible diagnoses or diagnostic procedure in the following case: A white woman aged 36, 5 feet 6 inches (168 cm.) tall, weighing 235 pounds (106.6 Kg.), complains of a large "lump" present on the upper outer quadrant of the left buttock. This "lump" is transient, appearing within a space of a few hours, persisting for several hours or days and finally disappearing as rapidly as it came. It has been present intermittently for the past six months. The time of appearance does not seem to be influenced by activity. There is some pain associated with this mass—at times referred medially to the region of the sacroiliac joint and at other times anteriorly to the groin. There is moderate discomfort on walking because of its size. The past history reveals three normal pregnancies, no miscarriages and no previous infectious diseases. She has complained of some pain in the left thigh of an indefinite nature for years. About six months before this swelling made its appearance she had a large earbuncle on the left knee. This is entirely healed at present. Physical examination reveals nothing of interest other than marked generalized obesity. On the upper outer quadrant of the left buttock is a swelling the size of a large grapefruit. There is no discoloration or fluctuation. It is apparently a muscular swelling and is only slightly tender. The upper edge reaches the crest of the ilium posteriorly. The temperature, pulse, blood pressure, urine and blood count are normal and the Wassermann reaction is negative. X-ray examination of the hip joint and adjacent structures revealed no pathologic condition. The patient was seen a day later. She stated that the mass had disappeared during her sleep the night before. Examination then showed no deviation in the normal contour of the buttock. About two days later, however, the patient returned with the mass present again; it had appeared that morning while she was baking and looked essentially the same as before.

M.D., Pennsylvania.

ANSWER.—This is an unusual case and certainly warrants careful study. The transient nature of the swelling excludes neoplasms of the soft part. Moreover, x-ray examination excludes neoplasms originating from the bone. It would seem that this swelling must be either some type of hernia or a fluid collection which has an hour-glass shape permitting the fluid to go back and forth from one to the other of two compartments. Hernia seems the more likely explanation, although the situation high on the buttock is hard to explain.

About thirty cases of sciatic hernia have been reported. In this condition the hernia emerges from the pelvis through the sacrosciatic notch and protrudes into the folds between the buttock and the leg (Andrews Edmund, in *Textbook of Surgery* Frederick Christopher, editor, Philadelphia, W. B. Saunders Company, 1936). This type of hernia is best repaired by laparotomy, and great care should be exercised to avoid injury to the sacral plexus.

In perineal hernia the herniation is through the pelvic floor, but in the posterior type of this hernia it emerges behind the transverse perineal muscle. It is possible that one of these rare types of hernia may explain the condition. Help to substantiate the diagnosis of hernia might be obtained by the x-ray film showing gas bubbles in the soft part as of loops of small intestine. Or, if an x-ray film of the gastrointestinal tract could

be taken when the swelling is present it might show barium-filled loops outside the pelvis. Aspiration would seem to be somewhat risky.

A rupture of the insertion of the gluteus muscle with bunching up of this muscle toward the crest of the ilium might be considered, but this would be constantly present with every effort to contract the gluteus.

After all other efforts at diagnosis have been exercised, this case would warrant surgical exploration from the outside.

DIGITALIS AND EPHEDRINE

To the Editor:—In *The Journal*, May 16, 1931, Johnson and Gilbert advised that "when digitalis is being used for the heart, ephedrine should not be used or with extreme caution." Has this been substantiated by other observers? Luten in his book *The Clinical Use of Digitalis* (Springfield, Ill., Charles C. Thomas, 1936) mentions Johnson and Gilbert's statement, page 127.

H. B. Aitkens, M.D., Le Center, Minn.

ANSWER.—The work of Johnson and Gilbert has neither been confirmed nor denied. It would only rarely be of importance clinically. Clinical doses of digitalis seldom reach 50 per cent of the minimal lethal dose. The lethal dose of ephedrine in the anesthetized dog is 70 mg. per kilogram, but in the unanesthetized dog it is about 40 mg. per kilogram. It is improbable that any clinical dose of ephedrine could possibly approach half this figure. On the other hand, if enough digitalis had been given to increase the irritability of the cardiac muscle up to a certain point, a moderate dose of ephedrine might further increase irritability and result in ventricular fibrillation and death. Digitalis, of course, should never be given to such a point.

The experimental work indicated a definite synergistic action between the two drugs. While fatal results clinically would be unlikely, except with a dosage of either drug which would never be necessary and which should never be used, it is just as well to bear in mind that experimental work does show a definite synergism, and they should be used with a moderate degree of caution.

EFFECT OF HIGH INTRACRANIAL PRESSURE ON PULSE AND BLOOD PRESSURE

To the Editor:—What influence does a rise in intracranial pressure of from 400 to 800 mm. of water have on the pulse rate and blood pressure? The literature is contradictory. Do you know any references to reports of cases, traumatic or otherwise, characterized by (1) a high cerebrospinal fluid pressure (but not high enough to approach the level of the systolic blood pressure), a lowered pulse rate and a rising blood pressure and (2) a return of pulse rate and blood pressure to normal when the intracranial pressure has been sufficiently reduced?

M.D., New York.

ANSWER.—In the presence of increased intracranial pressure the pulse is usually, but not always, slow until the breaking point of compensation, when it becomes increasingly rapid. In many instances, however, the pulse rate is not affected. The blood pressure is usually not altered but at times is increased slightly when the rise in pressure is sudden or rapid. The bradycardia will return to normal within a week or two after relief of intracranial pressure. There seem to be no precise records on this point, but the facts as given are well recognized in all clinics where intracranial pressure is commonly seen in the presence of tumors or cranial trauma.

DERMATITIS FROM ROCK WOOL

To the Editor:—Do you have any information concerning a dermatitis occurring among insulators who handle rock wool? What type of dermatitis is most common and is there definite evidence that the rock wool is the etiologic factor? What have been the most successful means of preventing this dermatitis? In other words, if there have been any reports of such a dermatitis I would appreciate learning as much about it as possible.

Ralph E. Jones, M.D., Chicago.

ANSWER.—Rock wool, slag wool, slagbestos or mineral wool is made by blowing air and steam through iron blast-furnace molten slag or through natural siliceous limestone or calcareous shale rocks when in a molten state. This converts the slag or rock into fine threads like cotton wool which are insect and fire proof. The product is used as an insulating material, a filtering medium, a covering for steam pipes and for packing.

Occupational dermatitis attributed to rock wool and confirmed by positive patch tests has previously been reported to the Office of Dermatoses Investigations of the U. S. Public Health Service. The irritating properties of this substance are said by R. Prosser White (*The Dermatogoses or Occupational Affec-*

tions of the Skin, ed. 4, London, H. K. Lewis Company, Ltd., 1934) to be due to its content of quicklime, 10 per cent, and calcium sulfide, 5 per cent, as well as to spicules which it contains. Its dust is said to be irritating also to the mucous membranes of the nose and eyes.

Since its alkaline content and the spicules it contains are said to be the causes of dermatitis from this material, it would seem that the wearing of rubber gloves and dust-proof clothing, with frequent changes of work clothes and cleansing shower baths after work, would offer the best protection against this occupational hazard to the skin. The use of protective ointments, especially those which are said to give protection against alkalis, may also be of benefit.

MIGRATION OF TESTES

To the Editor:—A boy now 10 years of age was seen shortly after birth, at which time he had an undescended right testis with the left testis in the scrotum. A few months later there was torsion of the right testis with gangrene, requiring its removal. I saw the boy recently and the left testis was still in the scrotum and was about the size of a pea. The mother showed me his brother, aged 7 years, whom I also saw at birth, and I know that both testes were normal at that time and were in the scrotum. When I saw the boy yesterday neither testis could be palpated and there was no evidence of any hernia. The youngest son, aged 4 years, has a small left testis with no evidence of a right testis. I know likewise that at birth he had both testes in the scrotum. I should like advice as to the prognosis and treatment.

M.D., Massachusetts.

ANSWER.—With regard to the boy aged 10 years who had one testis removed for gangrene because of torsion, as long as the left testis is in the scrotum one should do nothing and merely keep the boy under observation. It would be desirable to have the boy see his physician once a year.

With regard to the boy aged 7 years, in whom the testes were normal and in the scrotum at birth, it is stated that the physician saw the boy recently and neither testis could be palpated. It is well known that in some patients the testes do retract and move up and down—a phenomenon that has been recognized for a long time. It is failure to recognize this which leads to erroneous diagnoses. Some of these patients are prepared for operation for undescended testes, and just before the operation is started the testes are found in the scrotum. In several observed instances in which the testes moved up and down they ultimately found their way into the scrotum and stayed there.

The same explanation will suffice for the boy aged 4 years. He should be kept under close observation. Some patients who belong to this group and in whom this condition is not recognized are given long courses of endocrine treatment and the descent of the testes is erroneously ascribed to the use of the endocrine substance.

To sum up, these boys should report to the physician's office once a year. Nothing should be done in a surgical way and certainly they should not be given endocrine therapy.

TABES WITH NEGATIVE SEROLOGIC REACTIONS OF THE BLOOD AND SPINAL FLUID

To the Editor:—Is it possible to have syphilis of the central nervous system with repeatedly negative Wassermann and Kahn reactions of the blood since childhood and a spinal fluid in which the cell count is 1 and the colloidal gold curve and the Wassermann reaction are negative and globulin normal? The patient has a fixed, dilated right pupil, the knee jerks are absent, the Romberg sign is absent, there are questionable saber shins, there is a backache with questionable root-pain type of radiation and she is married to a man who has tabes but who was treated moderately before marriage.

M.D., New Jersey.

ANSWER.—It is possible, in fact it is noted quite frequently in a syphilologist's practice, that patients with clinical signs of tabes dorsalis will have negative reactions of the blood and spinal fluid. These are known as "burnt out tabetics" and the negative serologic reactions may have developed in one or two ways, either as the result of treatment or spontaneously. The latter group are less numerous and, although these serologic negative reactions developed without treatment, the use of arsenphenamine and bismuth compounds does not control the persistent symptoms such, for example, as the neuritis of tabes. The evidence presented in the inquiry is not enough on which to base a conclusive diagnosis of tabes, since some neurologists believe that such suggestive clinical manifestations might be the residue of a nonsyphilitic inflammatory lesion of the central nervous system. The fact that the husband has tabes increases the possibility that the patient under discussion may have had syphilis. Even so there is little that can be done for her, since antisyphilitic therapy in such cases offers but slight relief.

Universität Basel Medizinische Fakultät.....	(1936)	80.4	80.4
Université de Lausanne Faculté de Médecine.....	(1936)	82	
School	FAILED	Year Grad.	Per Cent
Medizinische Fakultät der Universität Wien.....	(1924)	74.1	
Université de Montpellier Faculté de Médecine.....	(1933)	73.3	
Albertus-Universität Medizinische Fakultät, Königsberg.....	(1922)	73.9	
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....	(1900)	72.9	
Friedrich-Wilhelms Universität Medizinische Fakultät, Berlin.....	(1911)	73.5	(1929)
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1912)	72.4	
Vereinigten Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg.....	(1921)	73.2	
Regia Università degli Studi di Genova Facoltà di Medicina e Chirurgia.....	(1924)	72.6	
Regia Università degli Studi di Modena Facoltà di Medicina e Chirurgia.....	(1934)	70.9	
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia.....	(1936)	68	
Université de Lausanne Faculté de Médecine.....	(1938)	72	

* These applicants have completed the medical course and will receive the M.D. degree on completion of internship. Licenses have not been issued.

† These applicants have received the M.B. degree and will receive the M.D. degree on completion of internship.

Virginia June Examination

Dr. J. W. Preston, secretary, Virginia State Board of Medical Examiners, reports the written examination held at Richmond, June 21-23, 1939. The examination covered eight subjects and included eighty questions. An average of 75 per cent was required to pass. One hundred and three candidates were examined, 102 of whom passed and one failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine.....	(1938)	82	
Howard University College of Medicine.....	(1938)	80	
Tulane University of Louisiana School of Medicine.....	(1917)	76	
Harvard Medical School.....	(1939)	80	
Hahnemann Med. College and Hospital of Philadelphia.....	(1939)	79	
Jefferson Medical College of Philadelphia.....	(1939)	84	
Temple University School of Medicine.....	(1939)	84	
Medical College of Virginia.....	(1936) 88, (1939) 75, 78, 78, 79, 80, 80, 80, 81, 82, 82, 82, 82, 82, 83, 83, 83, 84, 84, 85, 85, 85, 85, 85, 86, 86, 86, 86, 87, 87, 87, 87, 88, 88, 88, 89, 90, 91		
University of Virginia Department of Medicine.....	(1938) 79, (1939) 76,		
	77, 78, 78, 79, 80, 80, 80, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 86, 86, 87, 87, 87, 87, 88, 88, 88, 89, 90		
Queens University Faculty of Medicine.....	(1928)	77	
School	FAILED	Year Grad.	Per Cent
Howard University College of Medicine.....	(1938)	73.5	

Thirty-four physicians were licensed by reciprocity and seven physicians were licensed by endorsement on February 10 and June 23. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1937)		Arkansas
George Washington University School of Medicine.....	(1926)		New York,
(1934) Maryland			
Georgetown University School of Medicine.....	(1916), (1937)		Dist. Colum.
Northwestern University Medical School.....	(1932)		Wisconsin
University of Louisville School of Medicine.....	(1926), (1935)		Kentucky
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1917), (1937, 2)		Maryland
Johns Hopkins University School of Medicine.....	(1930), (1935)		Maryland
Harvard Medical School.....	(1933)		New York
Washington University School of Medicine.....	(1934)		Illinois
Columbia Univ. College of Physicians and Surgeons.....	(1935)		New York
Long Island College of Medicine.....	(1931)		S. Dakota
University and Bellevue Hospital Medical College.....	(1904)		New York,
(1931) District of Columbia			
Duke University School of Medicine.....	(1932)		W. Virginia
University of Cincinnati College of Medicine.....	(1938)		Ohio
Western Reserve University School of Medicine.....	(1937)		Ohio
Hahnemann Medical College and Hospital of Philadelphia.....	(1918)		Dist. Colum.,
Temple University School of Medicine.....	(1936)		W. Virginia
University of Pennsylvania School of Medicine.....	(1917)		Penna.
Medical College of the State of South Carolina.....	(1912)		S. Carolina
Meharry Medical College.....	(1926)		Missouri,
(1938) Tennessee			
University of Tennessee College of Medicine.....	(1922), (1935)		Tennessee
Medical College of Virginia.....	(1938)		N. Carolina
University of Wisconsin Medical School.....	(1936)		Wisconsin
McGill University Faculty of Medicine.....	(1922)		Penna.
School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
Georgetown University School of Medicine.....	(1935)		N. B. M. Ex.
Harvard Medical School.....	(1935)		N. B. M. Ex.
Temple University School of Medicine.....	(1936)		N. B. M. Ex.
University of Tennessee College of Medicine.....	(1929)		U. S. Navy
Medical College of Virginia.....	(1917)		U. S. Navy
McGill University Faculty of Medicine.....	(1936)		N. B. M. Ex.
University of Oxford School of Medicine.....	(1920)		Australia

Book Notices

Treatment in General Medicine. Edited by Hobart A. Reimann, M.D., Magee Professor of Practice of Medicine and Clinical Medicine, Jefferson Medical College, Philadelphia. In Three Volumes and Desk Index. Cloth. Price, \$30 per set. Pp. 895; 1001-1896; 2001-2334, with illustrations; 107. Philadelphia: F. A. Davis Company, 1939.

Recognizing that advancement of modern medicine has made medical problems so highly specialized that it is no longer possible for one individual to cover completely any single medical field, Dr. Reimann has developed a system of therapeutics in which distinguished specialists consider various phases of the treatment of individual diseases. Since treatment must depend on knowledge of cause and on symptoms, space is given to these subjects and also to considerations of other factors in disease intimately associated with treatment. It is recognized that psychotherapy is an intimate part of all the treatment of disease, and special attention is also given to this aspect of medical care. Finally, the volume includes discussions of minor surgical, gynecologic and obstetric treatment, as well as a chapter of the conditions associated with old age. The volumes are important also because they emphasize standardized and controlled treatment. Thus the remedies concerned are those available through the United States Pharmacopeia, the National Formulary and New and Nonofficial Remedies. In line with the recommendations of standard therapy, the work begins with a foreword by the editor of THE JOURNAL discussing the basis of scientific therapy. Thereafter the volume takes up, in the usual order, the treatment of infectious conditions, parasitic diseases, the heart the blood vessels, the gastrointestinal tract and the genitourinary tract. There are excellent discussions of prophylaxis. Selected bibliographies indicate to the reader the places for further detailed study. The list of contributors includes many of the best known names in modern medicine. In the final volume there are chapters on technical therapeutic procedures, irradiation, all of the various forms of physical and occupational therapy, and finally chapters on rest and the use of spas. This is a modern, direct, useful system of treatment.

The Surgical Treatment of Hypertension. By George Crile. Edited by Amy Rowland. Cloth. Price, \$4. Pp. 239, with 52 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

This work is a conglomeration of theories, facts, fallacies, scientific and pseudoscientific observations and unwarranted assumptions, welded together loosely in an unconvincing manner and in a style in which repetition and reiteration are apparently used to bolster the faltering argument. The constant assumption of unproved facts and the wide digressions into far flung fields of investigation, fields which are evidently unfamiliar to the author, confuse rather than clarify the subject. Many of the basic principles on which the flimsy superstructure is built are false or are erroneously interpreted. Controversial points are assumed to be definitely established. One is impressed with the apparent superficial knowledge of the author regarding much of present day physiologic concepts and especially of the functions and modus operandi of the sympathetic nervous system.

Considerable space is devoted to a comparison of the brains, thyroids, adrenals and celiac ganglions of fish, python, alligator, lion, tiger and man in the hope of promulgating a general law that the size of these organs determines the oxygen requirements and speed of oxygen utilization. "The size of the brain and the thyroid gland, the adrenal glands, the sympathetic system, the celiac ganglia, the aortic plexus, the heart, the volume of blood, the richness of the capillaries—all of these would be governed by a general law of energy release." It takes considerable imagination after reading the entire book to see just what this has to do with hypertension in man. However, except in small mammals and birds, Crile finds, "man is mechanized for the highest energy requirements of any animal on land or in the sea."

The next chapter indicates that it is a pathologic physiology of this mechanism governing the rate of oxidation and the circulation which produces hypertension. Later he suggests that only individuals who have abnormally large celiac ganglions and plexuses can have hypertension.

Medical Opinions on War. Published on behalf of the Netherlands Medical Association (Committee for War-Prophylaxis). Paper. Pp. 72. New York, Amsterdam & London: Elsevier Publishing Company, [n. d.]

In the old classical legend, Hercules, god of Force when engaged in a wrestling match with the young giant Antaeus, was surprised to find he could not overthrow him. Finally he learned the secret—that his young opponent was gegenes, earth born, and that, so long as he kept one of his feet on the earth, strength was imparted to him against which no external power could prevail. So the Olympian lifted Antaeus clear of his Mother Earth and, there and then, crushed him to death in his arms.

Investigations on the Sterilization Efficacy of Gaseous Formaldehyde.
By Gunnar Nordgren, Med. Lic. Acta pathologica et microbiologica
Scandinavica, Supplementum XL. Paper. Pp. 165, with 11 illustrations.
Copenhagen: Elnar Munksgaard, 1939.

Briefly, the reviewer understands that the sterilization efficacy of formaldehyde is greatest in an atmosphere of water vapor saturated with formaldehyde gas but that instruments should not be wet when placed in the sterilizer and the condensation of water during the process of sterilization should be avoided. In the author's experiments gas pressure, vapor pressure, time of exposure and temperature were carefully controlled. Heat was found to enhance the bactericidal action of formaldehyde. Recovery of organisms after exposure to formaldehyde was more frequent after the use of a sulfite solution; ammonia was of little or no value as a neutralizing agent. "The bactericidal efficacy depends upon the relative moisture of the gas, in all probability through the effect it has on the dried condition of the bacteria (spores) themselves. Dry formaldehyde gas is

nevertheless able to kill even spores which are in a very dry condition. . . . The gas has at least as strong sporicidal effect on spores which are not dried up as would have a formalin solution with which the gas is in equilibrium. . . . Sixteen experiments comprise simple sterilization tests carried out with seventy strains" of spore forming and non-spore forming bacteria and molds. For these tests the "test objects" were pieces of glass on which the organisms had been smeared and allowed to dry at 37 C. for from fifteen to twenty minutes. "In all cases the test objects were found to be sterile within a shorter space than an hour under the effect of air which, at room temperature (20-22 C.), was from half to three quarters saturated with formaldehyde and approximately saturated with water vapor." Greater difficulties are encountered in the sterilization of coarse particles of soil, porous materials and instruments with canals such as catheters. "For a safe sterilization of urethral catheters not even the 'formalin-vacuum principle' at 60° and an operation time of one hour is adequate. . . . Improvement is possible through previous evacuation followed by a relatively quick rise of pressure (by letting in air having a relative percentage of formaldehyde and water vapor as high as possible). . . . It must be pointed out that it is the rise of pressure as such, not the vacuum itself or the absence of air, which causes the penetration of the formaldehyde gas."

"The present prevailing opinion on formaldehyde sterilization must be completely changed. It should be unmistakably borne in mind that, although gaseous formaldehyde, as such, has a rather strong bactericidal efficacy, it has a very limited capacity to sterilize without the aid of specific technical expedients. Under such simple technical conditions as afforded by the Janet and Albarran principles, formaldehyde sterilizations can only be employed for very special purposes and with great precautionary measures. For more general purposes — for most of the objects which, in present day praxis, are treated in the Janet and Marion apparatuses — formaldehyde sterilization can only be made use of with the help of more complicated technical devices." The author describes the principles and uses of two such devices: (1) "a specific apparatus having no vacuum device, for the sterilization of one single instrument", such as an object "of simple shape, lacking canals or crevices, for instance, a simple endoscope"; (2) "an apparatus with a vacuum device for general purposes" in which alternate evacuation and admission of air saturated with formaldehyde may be employed.

A College Course in Hygiene. By K. Frances Scott, Ph.B., M.D., Associate Professor of Hygiene, Smith College, Northampton, Massachusetts. Boards. Price, \$2.50. Pp. 202, with 48 illustrations by Dr. William Dunlop Sargent and Margaret J. Sanders. New York: Macmillan Company, 1939.

This is an excellent college manual evidently intended for use primarily in Smith College for Women. The approach is biologic. The first chapter deals with the biologic nature of the body. Subsequent chapters in part I, which is devoted to hygiene as it concerns the individual, deal with the body's equipment for motion, equipment for energy production, the secretory function or chemical laboratory, the transportation systems (circulatory), metabolism and excretion, breathing, temperature control, equipment for acquiring information and equipment for coordination. The material is clearly, logically and briefly presented with numerous simple diagrams, charts, schematic drawings and silhouettes. The selection of material for practical usefulness has evidently been made with great care and excellent judgment. Elimination of extraneous material has contributed to the brevity of the work and yet is sufficiently complete to give the student an excellent orientation with relation to personal health. The second section is devoted to hygiene as it concerns the group, dealing with the human being's equipment for group living, his position as part of the race, and subsequent chapters taking up physical environment, control of the sources of supply, communicable diseases, special health needs and group agencies (public and private) for protecting health. Particularly complete, restrained and sensible are the sections relating to vitamins, stimulants, depressants, mental hygiene, sex and the venereal diseases. The venereal diseases are dealt with in connection with communicable diseases as is appropriate, and the sexual function is discussed in the chapters on the human being as part of the race immediately following the chapter on the human being's equipment for group living. The workbook

section is commendably brief, consisting of knowledge tests and personal inventory on general health, nutrition, food habits, colds, sleep, periodic function and civic health knowledge, plus ventilation surveys and lighting surveys. There is a brief but adequate index. Brief reading suggestions follow each chapter. The most frequent reference given in these reading lists is to *Hygeia*, the Health Magazine. The book can be recommended without reservation for use in institutions where women are taught or as a study manual for adult groups of women anywhere.

Grundriss der Geschlechtskrankheiten. Von K. Zieler. Third edition by Dr. Georg Birnbaum, o. Professor und Direktor der Universitätsklinik und Poliklinik für Haut- und Geschlechtskrankheiten in Königsberg/Pr. Boards. Price, 4.90 marks. Pp. 213, with 19 illustrations. Leipzig: Georg Thieme, 1938.

This is the first revision of "Zieler's Grundriss" in more than fifteen years. It is a brief discussion of the field of venereal diseases including gonorrhea, syphilis, soft chancre, venereal warts and nongonorrheal infections. This edition is by Birnbaum, a pupil of Zieler's. During the intervening years since the second edition political changes in Germany have definitely established the combating of venereal diseases as a public health problem. Therefore a brief discussion of the legal aspects of these diseases has been included. In the introduction, the point that prevention is more important than treatment is stressed. It is stated that there is little excuse for the continuance of venereal disease, it is so readily recognizable and treated. A third of the book is devoted to gonorrhea, including a brief discussion of the anatomy of the urethra, bacteriology, identification of the organism by staining and culture, the complications arising with treatment of each, explicit directions for examining both the male and the female, criteria for cure and a short discussion of the disease in children. Recent chemotherapeutic advances are not discussed, probably because the preparation of the book antedated them. Endocrine therapy in juvenile gonorrheal vaginitis is not discussed, nor is heat treatment. Complement fixation is regarded as merely a diagnostic adjunct. Vaccines are discussed at length. Soft chancre and venereal lymphogranuloma receive just a few pages; treatment of the latter with antimony and gold is briefly discussed. By far the greater part of the book is given to syphilis, including technique of preparation of the lesion for dark field examination, which the author believes is the most certain diagnostic point in recognizing syphilis. The lesions are thoroughly described and each drug is well discussed. Intramuscular mercury is favored by the author and the toxic effects are exhaustively shown. Malarial therapy is briefly discussed but no other forms of fever therapy are considered. In most respects the book fulfils the aim of the author. Many new trends in the field of venereal diseases are not included, probably because of the time element and the fact that the author intends to present briefly only facts that are certain.

Alcohol: Its Action on the Human Organism. By a Committee Originally Appointed by the Central Control Board (Liquor Traffic) and Later Reconstituted by the Medical Research Council. Third edition. Boards. Price, 30 cents; 1s. Pp. 176, with one illustration. New York: British Library of Information; London: His Majesty's Stationery Office, 1938.

In 1916 a distinguished British committee including such names as those of Cushny, Dale, Mott and Sherrington, later supplemented by Mellanby and Myers, prepared a statement on the effects of alcohol on the human body. In 1920 there was a careful revision, and a second edition appeared in 1924. The present edition has been prepared by a new committee, since some of the former members have died, and the book is now published on the authority of the Medical Research Council of Great Britain. It is an authoritative work as to the effects of alcohol on digestion and respiration and also considers its poisonous effects, its uses as a medicine, and the effect of alcohol on longevity. Here, it is the conclusion that mortality rates of persons especially exposed to the temptations of alcohol freely are unfavorable, but the statistical data now available do not suggest that a strictly moderate use of alcohol unfavorably affects the mortality rates of the users. The final conclusions are: "The temperate consumption of alcoholic liquors in accordance with these rules of practice may be considered to be physiologically harmless in the case of the large majority of normal adults; this conclusion, it may be added, is fully borne out by

the massive experience of mankind in wine-drinking and beer-drinking countries. On the other hand, it is certainly true that alcoholic beverages are in no way necessary for healthy life; that they are harmful or dangerous if the above mentioned precautions are not observed; further, that they may be definitely injurious for children and for most persons of unstable nervous system, notably for those who have had severe injuries of the head or who have suffered from attacks of mental disorder or from nervous shock."

Practical Dermatology and Syphilis. By Harry M. Robinson, M.D., Professor of Dermatology and Director of the Syphilis Clinic, University of Maryland School of Medicine, Baltimore. Cloth. Price, \$4.50. Pp. 397, with 439 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

Robinson presents a small textbook on dermatology which he states is "intended as an aid to the beginner in the study of dermatology (1) by helping him acquire a knowledge of the fundamentals of skin diseases, and (2) by showing how one may learn to recognize and diagnose the commoner diseases of this field." In his introduction he gives in a succinct manner a review of the "high spots" in dermatology with pertinent excerpts from some of the classic articles of the last decade. Since the work is intended as a small textbook on dermatology, the accounts are brief and there is no bibliography. There are forty-four pages on syphilis, and the subject on the whole is excellently treated. The illustrations are reproduced with a fair degree of accuracy. Figure 298, labeled Pemphigus foliaceus, shows a lesion in the left temporal area which impresses one as being more likely a patch of secondary vegetative dermatitis or epithelioma. The author deserves credit for knitting the details of his own diagnostic, clinical and therapeutic experiences into the text. While the book is an admirable small one and occupies a favorable position between the usual compend and the standard textbook on dermatology, it does not impress one as comparing with our better standard American textbooks.

Priests of Lucina: The Story of Obstetrics. By Palmer Flindley, M.D., F.A.C.S. Cloth. Price, \$5. Pp. 421, with 38 illustrations. Boston: Little, Brown & Company, 1939.

This book will be a welcome addition to the library of those members of the profession who are interested in medical history, whether or not they are obstetricians. It portrays the personalities of obstetricians, from the beginning of recorded literature to the present era, in a particularly interesting biographic style. The contents of the text are divided into two parts. Part one, comprising twenty-one chapters, presents in an especially readable way facts of obstetric history and biography. Part two deals with the history of special phases of obstetrics. Seldom does a book of this character present such a complete bibliography or one so well arranged for reference. To one interested in the history of medicine this is a treasure house of data. This alone should cause one to add the volume to one's library. The author states in the preface that he "has endeavored to select only the creative masters of the art, those who have contributed most largely to the making of an obstetric science, but it has not been possible to include all who have collaborated in the great work—it would be an endless task." He has selected well and made a decidedly valuable and interesting book.

Personality Changes After Operations on the Frontal Lobes: A Clinical Study of 32 Cases. By Gösta Rylander. Acta Psychiatrica et Neurologica, Supplementum XX. Paper. Price, 15s. Pp. 327, with illustrations. Copenhagen: Einar Munksgaard; London: Oxford University Press, 1939.

Any contribution on the functions of the frontal lobes of man is assured a large body of hopeful but apprehensive readers, for they have been disappointed often. Within this volume Gösta Rylander has gathered from the literature the salient opinions of other writers and has added a superb contribution of his own. The historical survey of twenty-seven pages covers the early epoch and the lessons learned from the study of brain injuries, tumors, Pick's disease, animal experimentation and partial excisions of the frontal lobes of man. The author's own contribution consists of follow-up examinations of thirty-two patients whose frontal lobes had been operated on from 1931 to 1938 in the Neurosurgical Clinic of the Serafimer Hospital. A critical selection of suitable cases, based on a study of the

excellent hospital records, was made. The author not only examined the patients by appropriate psychologic tests, of which he gives an informative description, but also visited them in their homes. He laid particular emphasis on appraising their adaptation to their work and to society in general. The case reports, which cover 169 pages, are followed by a survey of the results of the investigation, a discussion and summary, an appendix of tables and a helpful bibliography of fifteen pages. The felicitous selection of Mrs. Helen Frey as translator has given to the members of the profession an English rendition of a decidedly meritorious work on the personality changes after operation on the frontal lobes of man.

The British Encyclopaedia of Medical Practice Including Medicine, Surgery, Obstetrics, Gynaecology and Other Special Subjects. Under the General Editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. Volume XI: Scarlet Fever to Testis, Undescended. Cloth. Price, \$12. Pp. 676, with 94 illustrations. Toronto & London: Butterworth & Co., Ltd., 1939.

This volume is well up to the standard of the previous books in this system. The subjects discussed go from scarlet fever through such other main topics as sciatica, scurvy, sex hormones, sexual behavior and abnormalities, skin diseases, spinal cord diseases, spleen diseases, statistics, sterility, syphilis, and the testis. The authors are all British physicians of considerable note as investigators and practitioners in the fields of which they write. The volume is handsomely printed, profusely illustrated and well indexed.

A Textbook of Bacteriology: The Application of Bacteriology and Immunology to the Etiology, Diagnosis, Specific Therapy and Prevention of Infectious Diseases for Students and Practitioners of Medicine and Public Health. By Hans Zinsser, M.D., Consulting Bacteriologist to the Peter Bent Brigham Hospital and the Children's Hospital, Boston, and Stanhope Bayne-Jones, M.D., Professor of Bacteriology, and Denn, Yale University Medical School, New Haven, Connecticut. Eighth edition. Cloth. Price, \$8. Pp. 990, with 116 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1939.

Although there have been rapid advances in bacteriology and immunology in the last few years which have necessitated the addition of a good deal of material, this edition is somewhat smaller than the preceding one. The section on pathogenic protozoa has been omitted, and redundant and obsolete material in other sections has been deleted. Together with minor changes, this has provided space for the addition of material based on recent systematic studies of genera and species, bacterial variability, bacterial metabolism, chemical progress in refining of antigens, viruses and bacterial chemotherapy. Parts of the book make heavy reading and in some respects it is more suitable as a reference book than as a textbook for beginning students of bacteriology. The book will be used doubtless for both purposes quite successfully.

Travaux pratiques et démonstrations de pharmacodynamie. Par L. Dautrebande, professeur de pharmacodynamie et de pharmacologie, Faculté de médecine, Université de Liège, E. Philippiot, chef des travaux, F. Nogarède et R. Charlier. Paper. Price, 35 francs. Pp. 134, with 56 illustrations. Paris: Masson & Cie, 1938.

This laboratory manual on pharmacology is well organized and abundantly illustrated with kymographic tracings. In addition to the conventional pharmacologic experiments there is included material on such subjects as the carotid sinus and the technic of inducing gas anesthesia. The book goes briefly into the simpler chemical and biologic tests for poisons, and ten pages is devoted to methods for identifying war gases. On the whole, however, the book contains little that cannot be found in similar manuals published in this country. There is no index.

The Common Diseases of the Skin: A Handbook for Students and Medical Practitioners. By R. Cranston Low, M.D., F.R.C.P.E., F.R.S.E., Consulting Physician to the Skin Department, Royal Infirmary, Edinburgh. Third edition. Cloth. Price, 10s. 6d. Pp. 319, with 148 illustrations. Edinburgh & London: Oliver & Boyd, 1939.

This concise summary of present day dermatology gives the student and the practitioner an excellent introduction to the subject. The author's style is simple and easy to read, with emphasis on diagnosis and therapy of the commoner cutaneous disorders. In the chapters on eczema and urticaria the rôle of sensitization and focal infection is stressed. In the therapeutic sections most recent advances have been incorporated, although mention is not made of sulfanilamide and its possible uses in

dermatologic therapy or of the cutaneous reactions produced by it. In the chapter on drug eruptions mention should also have been made of phenolphthalein, phenobarbital and related compounds. The illustrations are well selected, including colored reproductions of moulages, black and white photographs, diagrams and characteristic histologic sections. Treatment in general is modern and not unnecessarily complicated. As an introduction to more complete volumes on dermatology, this book deserves unqualified approval.

A Classified List of Diagnoses for Hospital Morbidity Reporting. A Preliminary Report Based on a Study of 576,623 Hospital Discharges from 113 Hospitals in New York City in 1933. (WPA Project Number 665-97-3-54.) Welfare Council Publications 1939-IX. Paper. Price, 50 cents. Pp. 27. New York: Research Bureau, Welfare Council of New York City, 1939.

This is the first publication by the Welfare Council of New York City based on the results of the study of hospital discharges in New York City in 1933. The classified list of diagnoses of hospital morbidity reporting represents a study of nearly 600,000 discharges of patients from 113 hospitals in New York City. The diagnoses are based on the Standard Classified Nomenclature of Disease but for simplicity the diseases are listed under only 629 titles under such large divisions as "infectious diseases," "neoplasms," "neurology and psychiatric conditions" and "cardiovascular diseases." It will be most useful to some of the larger institutions and to those cities which desire to combine their morbidity figures from all different hospitals for extensive morbidity reports.

The Morphology of the Brachial Plexus with a Note on the Pectoral Muscle and Its Tendon Twist. By Wilfred Harris, M.D., F.R.C.P., Consulting Physician, St. Mary's Hospital, London. Cloth. Price, \$8. Pp. 117, with 87 illustrations. New York & London: Oxford University Press, 1939.

This excellent monograph describes the investigation of the different forms of the brachial plexus found in 158 varieties of animals from the amphibia to man. It followed the author's desire in 1902 to trace the different components of the fifth cervical nerve in a monkey with a view to a possible nerve anastomosis operation on a young child with a localized poliomyelitic paralysis of the deltoid and spinatus muscles. There are included sections of amphibia, reptilia, aves and mammalia, the latter including thirty human plexuses. The illustrations show various brachial plexuses and attachments of shoulder muscles (especially the pectoralis major). Harris explains the cutaneous supply of the median and ulnar nerves on the back of the hand and the motor supply of the ulnar nerve to the dorsal interossei in man by finding the dorsal fibers joining the ventral branches of the inner cord and distributed with the median and ulnar nerves. This monograph is highly recommended to all neurosurgeons and neuro-anatomists.

Health Problems in Negro Colleges. Proceedings of the First Regional Conference for Health Workers in Negro Colleges, Atlanta, Georgia, April 7 and 8, 1939. Paper. Pp. 63. New York: National Tuberculosis Association, 1939.

This pamphlet represents the proceedings of the first Regional Conference for Health Workers in Negro Colleges. This conference was called in Atlanta, Ga., by the National Tuberculosis Association, the American Social Hygiene Association and the Atlanta School of Social Work. It deals with general administrative problems related to the health of Negro college students under four principal headings: the tuberculosis problem, venereal diseases, health examinations and the improvement of hygienic teaching in Negro colleges. It should be of interest to all persons concerned with the higher education and social welfare of the Negro.

The Evolution and Organization of the University Clinic. By Simon Flexner, M.D. Paper. Price, \$1.25. Pp. 41. New York & London: Oxford University Press, 1939.

This little pamphlet combines two lectures given by Dr. Flexner at the Nuffield Institute in Oxford, England, in January 1938. The author traces briefly the development of the modern clinic and especially of the scientific laboratory, emphasizing the important features of organization of such modern institutions as the Rockefeller Institute.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Suspected Pregnancy or Ovarian Cyst; Failure to Use Friedman Test Negligence.—One of the plaintiffs, a married woman, consulted the physician defendant in either September or November 1934 relative to a possible pregnancy. The physician made a digital examination of the uterus. According to her testimony, he told her that she was pregnant. He testified, however, that he told her that she had an ovarian cyst, but she denied that he did so. Apparently she visited the physician's office from time to time thereafter and was examined, the physician defendant, according to the record, telling her repeatedly that she was pregnant. When she visited the physician in April 1935 her abdomen was distended and she complained that she had suffered severe pains during the previous month and had become very nervous. At that visit her husband asked her physician if there was not some way of determining whether his wife was or was not pregnant and her physician then suggested "the rabbit test," meaning thereby, presumably, the Friedman test or some similar test. The test was made and showed that the plaintiff was not pregnant. Thereafter an ovarian cyst about 6 inches (15.2 cm.) in diameter and weighing about 2 pounds (907 Gm.) was removed. The patient and her husband then sued the physician for malpractice. From a judgment in favor of the physician, the patient and her husband appealed to the Supreme Court of Washington.

In the course of the trial the plaintiffs offered to prove the number of "rabbit tests" that a chemist, the proprietor of a large local pathological and chemical laboratory, had made since 1931, the total number he made in 1934 and the number that he made for the defendant during that year. The trial court rejected the proffered evidence. The propriety of this rejection presented, according to the Supreme Court, the question to be determined on appeal.

It is well settled, said the court, that a physician must exercise that degree of care and skill which is ordinarily exercised by the members of his profession in the community in which he practices and in similar communities, having due regard for the state of medical and surgical science at the time. Ordinarily, whether a physician has exercised the degree of care and skill that the law requires is established by professional opinion, but this is not an invariable rule. There are instances in which facts alone prove negligence and it is unnecessary to have the opinion of persons skilled in a particular science to prove unskilled and negligent treatment. There is a difference, too, in malpractice cases, between mere errors of judgment and negligence in collecting beforehand data that are essential to the forming of a judgment. If a physician fails to inform himself as to facts and circumstances essential to the forming of a judgment and injury to the patient results from such failure, the physician is liable. Bearing these principles in mind, continued the court, we come to the question whether the chemist whose testimony was proffered should have been permitted to testify concerning the number of "rabbit tests" he had made.

The evidence showed that the "rabbit test" yielded correct results in 96 per cent of all cases. It was employed by physicians generally in the locality in which the defendant was practicing, in obscure cases. The physician defendant testified that the test was not in general use but was an aid and that he had from time to time employed it. Professional opinion was a unit in stating that where there was an ovarian cyst and the patient was not pregnant, it was correct practice to remove it, but that if the patient was pregnant it was correct practice to delay the operation, if it could be safely delayed, until after the birth of the child. An operation for the removal of the cyst while a patient was pregnant would in all probability result in the death of the child. In this case, the physician defendant testified that he suspected pregnancy and that he suspected also the presence of the cyst when he made the first examination of the plaintiff and that it was a matter of first importance when an ovarian

cyst was discovered to find out whether the patient was pregnant. The question then, continued the court, was whether the physician, in failing to employ the "rabbit test" earlier than he did and relying on the digital examination, neglected to collect data essential to a proper conclusion in the case. If he had discovered sooner that the patient was not pregnant, the cyst could have been removed earlier and the patient would have been saved from a long period of inconvenience and severe pain, resulting in a nervous condition.

The extent to which the "rabbit test" was applied in the locality in which the physician defendant practiced had a material bearing on the question of whether he was or was not negligent in not applying the test earlier. Courts have repeatedly held that the failure on the part of a physician to make a roentgenogram or to have a roentgenogram made as an aid to correct diagnosis, when x-ray machines are available and are commonly used by physicians in similar cases, may constitute actionable negligence. Applying the same principle to the utilization of the "rabbit test," it follows that the extent to which that test was utilized by physicians in the locality in which the physician defendant practiced was a material subject of inquiry in determining whether the physician was or was not guilty of negligence in failing to make use of the test at an earlier date. The testimony of the chemist which was proffered and rejected, said the court, was material and competent and its rejection was prejudicial error.

Judgment in favor of the physician defendant was reversed and a new trial ordered.—*Peterson v. Hunt (Wash.)*, 84 P. (2d) 999.

Workmen's Compensation Acts: Back Injury; Objective Evidence of Injury—Determinative Effect of Lay Testimony.—The claimant, in the course of his employment, attempted to lift a bucket of nuts and bolts weighing about 60 pounds. He felt a sharp pain in the lower part of his back and in his hips and could not lift the bucket nor straighten up. An osteopath, whom the claimant's foreman advised him to consult, found, so he testified later, "a severe injury to the ligaments and muscles in the area of the back, in the location of the first lumbar vertebra." He believed that "a fracture or injury of the vertebra had occurred." A company physician ordered the disabled workman to a sanatorium, where he remained nine days. After he returned home he remained in bed for about three weeks more. Thereafter he instituted proceedings under the Louisiana workmen's compensation act for compensation for total and permanent disability. The trial court rejected his claim and he appealed to the court of appeal of Louisiana, second circuit.

The employer contended that there was no evidence of objective symptoms of the alleged injury and that the Louisiana workmen's compensation act made such symptoms a condition precedent to an award of compensation. The court believed, however, that the evidence adduced met the requirements of the statute. The court pointed out that there was evidence that the claimant complained of his injury immediately after the accident; that his foreman and his fellow employees saw that he was injured and assisted him to the osteopath's office; that the osteopath recognized the injury; that the employer's physician sent him to a sanatorium, and that certain patients in that sanatorium observed the claimant's distress and suffering during his stay there.

To substantiate the defendant's contention that at the time of the trial the claimant was not suffering from any disability, it relied principally on the testimony of six physicians. Some of them had made clinical examinations of the claimant and others testified solely on the basis of roentgenograms. Their testimony was in irreconcilable conflict with the testimony of four physicians called on behalf of the claimant. In any case, said the court, in which the medical testimony is as conflicting as here, the court is forced to look to the lay testimony for a solution.

It is immaterial, continued the court of appeal, whether or not a claimant can prove the exact injury he suffered. It is sufficient in this case for the claimant to show that his back was injured and the location of the injury and the fact that the injury renders him unable to perform ordinary manual labor.

Were a workman required to prove the exact part of his back that was injured "he would be left to the mercy of the medical profession, which never fails to disagree as to the injury of a back." The lay testimony, however, in this case was overwhelmingly in the claimant's favor. It was shown beyond question that he had performed no manual labor since the accident and that on stated occasions he suffered pain and discomfort when he attempted to exert himself. The claimant, said the court, is either totally disabled to perform manual labor or he is an "A No. 1 malingeringer." The record does not justify this court in finding him to be a malingeringer. The court is, therefore, forced to find that he was totally disabled to perform work of a reasonable character at the time of the trial.

There is evidence in the record, said the court, that the claimant's back shows an arthritic condition. Practically all the medical witnesses testified that an injury to the back when in that condition will often cause a dormant arthritis to flare up and give trouble. Even if that is what happened, however, the injury is compensable.

The court accordingly entered a judgment in favor of the claimant.—*Phillips v. Yasoo & M. V. R. Co. (La.)*, 183 So. 43.

Hospitals: Nonprofit Hospital Corporation Not Liable for Negligence.—The plaintiff was born in a hospital Oct. 6, 1926. He was placed in a crib in the nursery with several other infants, among them a premature baby. To afford warmth for the premature baby an incubator was improvised, using as a source of heat an electric light globe. Either because of the defective condition of the electric wiring by which the globe was put into service or because of the close proximity of the globe to the cotton bedding, the crib in which the premature baby was lying caught fire. That baby was burned to death and the fire passed from the crib in which it was lying to the crib in which the plaintiff was sleeping, and the plaintiff was injured. On behalf of the injured child, his mother sued the hospital for damages. The jury returned a verdict in favor of the plaintiff, but on motion of the defendant a judgment was rendered in its favor notwithstanding the verdict. From that judgment, the plaintiff appealed to the appellate court of Illinois, first district, third division.

There is no controversy, said the court, as to the happening or as to the cause or result of the injury sustained by the plaintiff. It was conceded, too, that if the defendant in the case was a charitable organization as defined by the laws of the state of Illinois it was not liable for the negligence of its servants and employees. The provisions of the charter, said the court, determine the character of the organization and the purposes for which it was organized. Where a corporation, as shown by the terms of its charter, is operated not for profit and has no provision for the issuance of stock or the payment of dividends to incorporators or stockholders and where it appears that its purpose is to conduct a hospital, the law recognizes it as a charitable institution. The evidence, the court thought, was sufficient to prove the charitable character of the hospital defendant in this case. The injuries were grievous and would enlist sympathy if that were one of the elements to be considered in arriving at a decision, but under the law the court was obliged to hold that no liability attached to the defendant hospital.

The judgment of the trial court was affirmed.—*Marelick v. South Chicago Community Hospital (Ill.)*, 17 N. E. (2d) 1012.

Autopsies: Liability for Performance of Autopsy on Illegal Order of Justice of the Peace.—A workman, Love, instituted proceedings under the Texas workmen's compensation act for compensation for an injury allegedly due to his employment. Love died and a claim adjuster for the insurer of Love's employer procured from a justice of the peace an order for an autopsy. The autopsy was performed by the county health officer and another physician, each of whom was paid \$50 by the insurance company. Information obtained through the autopsy was used by the insurance company to defeat the claim for compensation. Love's brothers and sisters sued the insurance company for having unlawfully procured the performance of the autopsy without their consent. The trial court directed a verdict in favor of the insurance company, but the court of civil appeals of Texas, Beaumont, reversed that judgment and remanded the case for a trial on its merits. *Love v. Aetna*

Casualty and Surety Company (Texas), 99 S. W. (2d) 646; abstr. J. A. M. A. 109:387 (July 31) 1937. The insurance company then appealed to the Supreme Court of Texas.

In Texas, the Supreme Court pointed out, the authority of a justice of the peace to order an autopsy is derived exclusively from statute and may be lawfully exercised only for the detection of crime. It is to be presumed that a justice of the peace who orders an autopsy acts in the exercise of sound discretion and in good faith for the purpose of detecting crime, but this presumption is rebuttable. In the judgment of the Supreme Court, the testimony of the claim adjuster justified a finding that he had submitted the facts of Love's injury and death to the justice of the peace to induce that officer to order an autopsy for the purpose of determining whether or not Love had sustained a compensable injury and that the justice of the peace ordered the autopsy for that purpose. Such a finding by the jury would have destroyed the presumption of regularity of the justice of the peace's order for the autopsy and would have established that the justice of the peace ordered the autopsy for a purpose not authorized by law.

The Supreme Court of Texas therefore affirmed the judgment of the court of civil appeals, remanding the cause for a trial on its merits.—*Aetna Casualty & Surety Co. et al. v. Love et al.* (Texas), 121 S. W. (2d) 986.

Medical Practice Act (Utah): Revocation of License for Violating Narcotic Drug Act; Both Convicting Court and Licensing Agency Authorized to Revoke.—The medical practice act of Utah authorizes the Department of Registration to revoke or suspend the license of a physician guilty of unprofessional conduct, which the act defines to include, among other things, the prescribing of narcotic drugs in violation of law. The narcotic drug act of Utah, enacted subsequent to the enactment of the medical practice act, authorizes the court before which a physician has been convicted of violating its provisions not only to fine or imprison him but also, in its discretion, to revoke or suspend his license to practice.¹ Light, a licensed physician, was convicted of prescribing narcotic drugs in violation of the act, but the court did not revoke or suspend his license. The Department of Registration later instituted proceedings to effect that end. Light then petitioned the district court of Salt Lake County for a writ of prohibition to prevent further proceedings by the department. On demurrer, the trial court refused to issue such a writ and Light appealed to the Supreme Court of Utah.

The petitioner contended that the department had no jurisdiction to revoke or suspend the license of a physician convicted of violating the state narcotic drug act, since authority to revoke or suspend a license for such an offense was vested by the narcotic drug act itself exclusively in the court before which the physician was convicted. It is apparent, however, answered the court, that the state narcotic drug act intended to give the convicting court a power additional to that of fining and imprisoning a physician convicted of violating the act when it authorized it also to revoke or suspend his license to practice. If the court does not revoke or suspend the license, the Department of Registration, said the Supreme Court, still has the power to do so. This is shown by the fact that the clerk of the court, on conviction, is required by the act to send a copy of the judgment and sentence, together with the opinion of the court, if any, to the Department of Registration. If this sentence shows that the court has revoked or suspended a license, the department needs to go no further in that regard but has only the duty of seeing that the physician does not practice while his license is not in force. If the sentence does not include revocation or suspension, however, the department can proceed administratively to revoke or suspend the license of the convicted physician. Even independently of any criminal charge, too, the department may institute revocation proceedings. There is nothing inconsistent or incompatible in giving the court the power to revoke or suspend a

license and at the same time leaving in the administrative board or department authority to proceed to the same end.

Accordingly, the Supreme Court affirmed the judgment of the court below, in effect permitting the Department of Registration to institute and maintain proceedings for the revocation or suspension of the license of the petitioner notwithstanding the fact that the court did not do so.—*Light v. Golding, Director of Department of Registration* (Utah), 85 P. (2d) 114.

Cosmetology: Electrolysis as "Beautifying the Human Face."—In New York City no person may conduct a beauty parlor without a permit from the board of health. The Sanitary Code defines a "beauty parlor" as a place "wherein the business of . . . beautifying the human . . . face, . . . or hands, is conducted for fee, charge, or hire." The defendant practiced electrolysis in a one story house located in a residential zone. She had applied for a permit to operate a beauty parlor but her application was denied because the building department would not certify to the propriety of a business use in a residence zone or district. She was convicted of operating a beauty parlor without a permit and appealed to the supreme court of New York, appellate division, second department.

The defendant did no manicuring or massaging but confined her activities to the removal of hairs, by electrolysis, from all parts of the bodies of patrons. There is no doubt, the court said, that the removal of unwanted hair from the human face is commonly deemed "beautifying the human . . . face," within the meaning of the Sanitary Code. The fact that the defendant removed hair from the body, not mentioned in the Sanitary Code, as well as from the face and hands, did not exclude her activity from the purview of the code. To interpret the provisions of the code so as to enable a person who does certain types of work, not mentioned therein, also, without a permit, to do work specifically within its terms, when the latter work is general and not casual or sporadic, would, the court said, be to nullify the statutory provisions and countenance clear evasion thereof. The removal of hair from the face was characterized, the court continued, as a "type of beauty culture" in a case holding that using electrolysis was not the unlawful practice of medicine. Likewise, it has been held that the use of electrolysis to prevent growth of hair is similar to the work of a barber in removing hairs on a man's face. *People v. Lehrman*, 251 App. Div. 451, 296 N. Y. S. 580, affirmed 276 N. Y. 479, 12 N. E. (2d) 166; abstr. J. A. M. A. 110:839 (March 12) 1938.

In the opinion of the supreme court, the defendant conducted a beauty parlor without a permit in violation of the statute. The judgment of conviction was therefore affirmed.—*People v. Cohen* (N. Y.), 8 N. Y. S. (2d) 70.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 748 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Allen Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Southwestern Medical Association, El Paso, Texas, Nov. 9-11. Dr. M. P. Spearman, 1001 First National Bank Bldg., El Paso, Texas, Secretary.
- Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

1. In this respect the provisions of the Utah act correspond with those of the Uniform Narcotic Drug Act as formulated by the National Conference of Commissioners on Uniform Laws and enacted by many states.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

9: 545-580 (Sept.) 1939

- Preparation of Universally Compatible Ascitic Fluid for Transfusion. R. M. Choisser and Elizabeth M. Ramsey, Washington, D. C.—p. 545.
Silent, So-Called Primary Tuberculosis of Spleen. H. Fox, Philadelphia.—p. 549.
Effect of Ingested Sodium Chloride on Concentration of Hemoglobin. A. G. Sheffel, Los Angeles.—p. 554.
Leiomyofibromatosis: Multiple Tumors of Abdomen and Pelvis. J. W. M. German, Cincinnati.—p. 558.
Spindle Cell Sarcoma of Prostate. M. J. Fein, New York.—p. 564.

American J. Digestive Diseases, Huntington, Ind.

6: 429-504 (Sept.) 1939

- Etiology, Diagnosis and Medical Management of Pancreatic Disease. E. H. Gaither, Baltimore.—p. 429.
Activity of Lower Part of Ileum of Dog in Relation to Ingestion of Food. D. M. Douglas and F. C. Mann, Rochester, Minn.—p. 434.
Over Two Thousand Estimations of Hydrogen Ion Concentration. M. A. Bridges and Marjorie R. Mattice, New York.—p. 440.
Phenolphthalein as Test for Gastrointestinal Ulceration in Experimental Animal. B. Slutsky and C. M. Wilhelmj, Omaha.—p. 449.
Anal Cryptitis. C. J. Drucek, Chicago.—p. 450.
Adenocarcinomatous Pedunculated Polyp of Esophagus: Report of Case. M. Feldman, Baltimore.—p. 453.
Abnormalities in Rectal Tone and Contraction in Paraplegia and Hemiplegia. S. J. Rosenberg and O. R. Langworthy, Baltimore.—p. 455.
*Nutritional Availability of Iron in Molasses. R. S. Harris, L. M. Mosher and J. W. M. Bunker, Cambridge, Mass.—p. 459.
New Approach to Prevention of Hemorrhages from Esophageal Varices as Occur in Cirrhosis and Banti's Disease. C. H. Dreuckhahn, Urbana, Ill.—p. 462.
*Significance of Presence of Calcium Bilirubin Pigment and Cholesterol Crystals in Feces. F. Boerner, T. A. Johnson and M. Ganniny, Philadelphia.—p. 466.
Physiologic Control of Normal Human Gastric Secretory Curve. C. M. Wilhelmj and A. Sachs, Omaha.—p. 467.

Available Nutritional Iron in Molasses.—Harris and his co-workers estimated the availability of iron in molasses by the chemical (dipyridyl) procedure and by the biologic assay procedure. The molasses used in their tests was prepared from Louisiana sugar cane. Juice is extracted by pressure from crushed cane, heated, treated with sulfur and lime to precipitate some of the impurities, clarified and concentrated to 40 degrees Baume by heating at 63 F. This sugar cane syrup is boiled down still further to crystallize the sugar, and the resulting liquor was called sample A. A portion of this "first" molasses is diluted with cane juice and reworked to obtain another extraction of sugar. The resulting liquor was called sample B. The "second" molasses is diluted with water, reboiled to obtain another extraction of sugar and the resulting liquor was called sample C. The "available" iron by the chemical method in the three kinds of molasses was found to be 97, 85 and 54 per cent, respectively. By the biologic (rat) method the availability was slightly more than 90, 80 and 50 per cent, respectively. The dipyridyl procedure is acceptable for the determination of the availability of iron in molasses. Molasses is a rich and inexpensive source of available iron. The authors point out that, although the iron in high grade molasses is more available than that in a lower grade of molasses, the higher grade is not as rich in total available iron. For example, 100 Gm. of molasses A furnished slightly more than 3.1 mg. of "available" iron, whereas the same quantity of molasses B contained approximately 5.1 mg. of "available" iron. The results obtained with molasses C do not agree with those of Shackleton and McCance, who reported that the iron in black treacle is 100 per cent available. In the authors' experience only 54 per cent was available. It is not correct to base one's judgment of a food on its total iron

content, since iron availability varies with the kind of food. Molasses B is the type commonly used in the home; 85 per cent of its iron is available. Of the foods reputed to be excellent sources of iron, only liver compares favorably with molasses. Whipple and Robscheit-Robbins have listed chicken and beef liver, chicken gizzard, beef kidney, eggs, apricots and raisins as especially valuable in the treatment of anemia. From the authors' studies on these foods it appears that molasses is superior to all these foods in this respect and is, moreover, the most inexpensive food source of iron.

Significance of Bilirubin and Cholesterol in Feces.

The occasional presence of calcium bilirubinate, cholesterol or both in routine feces examinations led Boerner and his colleagues to examine 2,003 stools, in sixty-seven of which calcium bilirubinate, cholesterol crystals or both were found. In many instances the stools came from patients who were in the hospital for study of some condition unrelated to the biliary tract. Calcium bilirubinate alone was found in the feces in twenty-five cases and cholelithiasis was confirmed in eighteen. Of the remaining seven cases the diagnosis of cholelithiasis was not substantiated. Apart from cholelithiasis, two mechanisms may account for the presence of calcium bilirubin pigment in the bile and consequently in the feces: sudden release of noncalculous mechanical block of the main bile ducts or an increase in the serum bilirubin secondary to increased hemolysis may give rise to calcium bilirubinate in the bile in the absence of biliary disease. In a number of instances the first intimation of possible gallstone disease was the finding of calcium bilirubin pigment in the feces of a patient in whom that diagnosis was not suspected. Of fourteen cases in which cholesterol crystals alone were reported in the feces, there was only one in which the diagnosis of cholelithiasis was confirmed. Seven of the cases, however, were not studied for cholelithiasis.

American Journal of Medical Sciences, Philadelphia

198: 301-444 (Sept.) 1939

- *Streptococcus Viridans Endocarditis Lenta: Clinicopathologic Analysis of Experience in Wisconsin General Hospital. W. S. Middleton and M. Burke, Madison, Wis.—p. 301.
Occurrence of Coronary Artery Thrombosis in Polycythemia Vera. H. R. Miller, New York.—p. 323.
Voluntary Hypercirculation. E. Ogden and N. W. Shock, Berkeley, Calif.—p. 329.
Brucellosis with Endocarditis: Report of Case with Failure of Sulfanilamide Therapy. K. M. Smith and A. C. Curtis, Ann Arbor, Mich.—p. 342.
*Effect of Sulfanilamide on Spermatogenesis in Man. N. J. Heckel and C. G. Hori, Chicago.—p. 347.
*Treatment of Pneumonia with Type Specific Immune Rabbit Serum. V. B. Callomon, Pittsburgh.—p. 349.
Respiratory Defense Mechanism: Its Relationship to Pulmonary Diseases. I. L. Applebaum, Newark, N. J.—p. 356.
*Studies on Oxyuriasis: XVIII. Symptomatology of Oxyuriasis as Based on Physical Examinations and Case Histories on 200 Patients. F. J. Brady and W. H. Wright, Washington, D. C.—p. 367.
Platelets in Pernicious Anemia, with Review of Literature. F. K. Paddock and Katharine Edsall Smith, New York.—p. 372.
Erythroblastic Anemia: Report of Two Cases in Adult Siblings, with Review of Theories as to Its Transmission. Dorothy W. Atkinson, San Francisco.—p. 376.
Mitotic Leukoblasts in Peripheral Blood in Infectious Mononucleosis. H. Bowcock, Atlanta, Ga.—p. 384.
Prognostic Significance of Eosinophils in Blood in Pneumonia. M. M. Bracken, Pittsburgh.—p. 386.
Evaluation of Phenolphthalein Test of Woldman. R. L. Vine and J. B. Kirsner, Chicago.—p. 389.
"Numeral Test" in Transverse Lesions of Spinal Cord. R. Wartenberg, San Francisco.—p. 393.
Effect of Alterations in Metabolic Rate on Action of Insulin. G. W. Hayward and G. G. Duncan, Philadelphia.—p. 396.
Cervicic Acid Deficiency: Frequency in Group of 100 Unselected Patients. J. D. Croft and L. D. Snorf, Evanston, Ill.—p. 403.

Streptococcus Viridans Endocarditis Lenta.—Middleton and Burke present the clinical and pathologic features of eighty-eight cases of Streptococcus viridans endocarditis lenta which were observed at the Wisconsin General Hospital. They think that some of the details of the clinicopathologic analysis merit special emphasis. They adduce further evidence in support of a close relationship between congenital and rheumatic lesions of the heart and endocarditis lenta. Acute upper respiratory infections, rheumatic fever, infected abortion, dental extraction and massage for nonspecific prostatitis apparently served as precipitating factors in the development of certain cases of this condition. Contrary to the accepted opinion, congestive heart failure may attend or mask this condition. The clinical manifestations and course are varied and inconstant. After the

cardiac changes, particular attention was directed to its toxic and its embolic features. Splenic and renal changes, including embolism, were frequent. Mycotic aneurysms offered serious diagnostic problems. Cerebral accidents were not infrequent. Occasionally a mycotic aneurysm of a cerebral vessel may explain certain neurologic phenomena of this condition. Again the clinical picture may suggest thyrotoxicosis, and the unexplained elevation of the basal metabolic rate may add to the diagnostic confusion. This study offers material support to the importance of the diagnostic triad petechiae, splenomegaly and a positive blood culture for the *Streptococcus viridans*. Given the background of a congenital or a rheumatic heart lesion and a remittent fever, this triad offers the logical direction of attack. The prognosis of *Streptococcus viridans* endocarditis lenta is grave. Only inferential evidence of the pace of the decline is offered by the circulatory, renal, embolic, toxic, constitutional and hematologic reactions. Although remissions of varying durations and degrees are the rule, certain of these patients undergo a rapidly progressive decline. Attention is directed to the ominous significance of the euphoria that attends late remissions. This group included one instance of healed endocarditis lenta. The clinical activity apparently occurred at a period previous to the hospitalization. In the remaining eighty-seven cases all treatment was unavailing.

Effect of Sulfanilamide on Spermatogenesis.—Heckel and Hori say that the administration of sulfanilamide derivatives to man has been thought to influence spermatogenesis. To study this problem the authors analyzed the semen of eleven patients before and after sulfanilamide was given. They describe their method of examination and in a table they show the number of specimens examined, the total number of spermatozoa and the percentage alive before, during and after treatment; the time specimens were obtained in relation to the treatment and the duration of the treatment. The sulfanilamide was given by mouth up to a total of 40 grains (2.6 Gm.) daily, except when the drug was not tolerated, and then the dose was reduced or the patient was put on a rest period for two or three days. In contrast to other reports, these data indicate that in eleven cases there were no noteworthy effects on the total number or percentage of live spermatozoa from the use of sulfanilamide. Such variations as occurred in the spermatozoa counts during and after treatment were no greater than the variations which occurred before the drug was given.

Type Specific Immune Rabbit Serum in Pneumonia.—Callomon reports experiences with type specific antipneumococcus rabbit serum in forty-five cases. Included in this series are cases of pneumonia of types I, II, IV, V, VII and VIII. The only factor entering into their selection was the availability of a homologous immune serum at the time of their admission. In the majority of cases the product employed was unconcentrated. In a few of the more recent cases a concentrated preparation was administered. All cases reported showed roentgenographic evidence of consolidation and a positive blood culture or sputum in which the pneumococcus was the predominating organism. A history, physical examination, urine analysis, blood count, blood culture, sputum examination and roentgenogram of the chest were obtained on admission. Blood cultures were taken at two day intervals or more frequently when indicated. Identification of the type of pneumococcus present in the sputum was made by the Neufeld method and in many cases confirmed by passage through the mouse. Before treatment was instituted, all patients were given ophthalmic and intracutaneous tests for sensitivity to the specific serum which was to be used. The usual precautions, advisable in all serotherapy, were observed. When a positive intracutaneous test was associated with a negative ophthalmic test, the administration of serum was undertaken, but with more than the usual caution. All serum was given intravenously. At first, doses of 20,000 units were given at two hour intervals. Later this plan of treatment was altered, as the administration of larger doses seemed preferable in order to introduce the total dose in as short a time as possible. Following an initial dose of 20,000 units, one or more doses of 100,000 units were given until it was apparent that the disease was being brought under control. Subsequently, smaller doses were given as seemed indicated until recovery was complete. In several cases one injection of 100,000 units following the

initial dose of 20,000 units was sufficient to secure the desired result. Supplementary treatment consisted only of dietary regulation and symptomatic treatment, including oxygen administration, when indicated. Regarding the results obtained with this treatment, the author says that two deaths occurred in this series. Premature recovery by crisis or rapid lysis ensued in thirty-six cases. No serious serum reactions were observed.

Symptomatology of Oxyuriasis.—Brady and Wright made studies in 200 cases of oxyuriasis. This material included persons seeking treatment for known pinworm infestation, persons referred to them because of symptoms suggestive of oxyuriasis and persons in whom pinworms were detected by anal swab examinations made in the course of studies on the incidence of oxyuriasis. Comparative studies were made on two control groups. One group of seventy-two persons was negative for pinworms on examination by the swab method, but they lived in households together with infested subjects. A second group of twenty-one persons was negative for pinworm and lived in homes in which no member of the family was found infested. In each of the 200 cases of oxyuriasis the history was taken, a physical examination was made, a stool sample was examined for helminth ova, anal swabs were made, and in girls a vulvar swab was made. The opinion is expressed that symptoms may be caused by mechanical stimulation and irritation by the parasite, by allergic reactions, and by the transportation of organisms to places where they may become pathogenic. Many infested children showed gains in weight, improvement in color, and disappearance of dark circles under the eyes after treatment. There was an average eosinophil percentage of 5.1 in 144 pinworm cases compared to 3.7 in twenty-one children coming from households in which all persons were free from pinworms. There is too much deviation from the mean for these figures to assume statistical significance, but it is likely that there is a slight increase in eosinophil percentage in oxyuriasis. One case presented symptoms of nausea and vomiting that could not be attributed to causes other than the pinworm infestation. These symptoms disappeared when the pinworm infestation was eradicated. The authors found no proof that abdominal pain and oxyuriasis were directly related. Only one patient of the 200 had had an appendectomy. The appetite in many cases was much improved after treatment. It is believed that pinworms cause conscious sensation when moving on the rectal and anal mucosa but that no sensation is felt in the majority of cases after the pinworm has migrated onto the skin. Allergic reactions to pinworm products are probably associated with the marked sensation experienced by some few persons from skin migrations. Enuresis was not found to be more common in infested patients than in noninfested controls. Evidence is presented that a pinworm vaginitis may be much more frequent than it has been considered to be in the past. Restlessness and insomnia are symptoms occurring in pinworm cases. Restlessness in school may lead to scholastic difficulties. The feeling of shame that an impressionable child may have from the consciousness of having pinworms may have repercussions in the behavior of the child. Evidence to show that pinworms cause nervous irritability was inconclusive.

American Journal of Ophthalmology, St. Louis

22: 953-1070 (Sept.) 1939

- So-Called Oguchi's Disease in the U. S. A.: Case. Bertha A. Klien. Chicago.—p. 953.
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 Retinal Hemorrhages After Transfusion. R. J. Gray, Pittsburgh.—p. 979.
 Isolated Rheumatic Nodule of Upper Eyelid: Report of Two Cases. J. S. Guyton and J. M. McLean, Baltimore.—p. 985.
 The Need for Social Service Work in Glaucoma. A. F. Jensen, Grand Forks, N. D., and H. S. Gradle, Chicago.—p. 993.
 Ophthalmomyiasis Interna Anterior: Report of Hypoderma Larva in Anterior Chamber. C. S. O'Brien and J. H. Allen, Iowa City.—p. 996.
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 Study of Ocular Defects Among University Students. E. A. Thacker, Urbana, Ill.—p. 1003.
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 Prophylactic Foreign Protein Therapy in Cataract Extraction. C. A. Noe, Cedar Rapids, Iowa.—p. 1014.

American Journal of Surgery, New York

45:417-614 (Sept.) 1939. Partial Index

- Tumefactions of Abdominal Wall. W. H. Meade and W. R. Brewster, New Orleans.—p. 419.
Preoperative and Postoperative Care of Patients with Gastric Cancer. G. T. Pack and Isabel M. Scharnagel, New York.—p. 435.
Rational Postoperative Treatment Following Abdominal Operation. L. E. Mahoney, Santa Monica, Calif.—p. 452.
Surgical Considerations of Temperature in Ligated Limbs. F. M. Allen, New York.—p. 459.
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Pigmented Nevi, with Special Reference to Their Surgical Treatment. J. W. Malinac, New York.—p. 507.
*Impurities in Ether. H. H. Bradshaw, Philadelphia.—p. 511.
*Appendicitis Complicated by General Peritonitis: Method of Treatment That Lowers Mortality Rate. E. G. Williamson, and L. M. Rankin, Philadelphia.—p. 528.
Treatment and Management of Burn Cases. H. J. Lavender, Cincinnati.—p. 534.
Treatment of Burns. H. D. Cogswell, Tucson, Ariz., and C. Shirley, Tyler, Texas.—p. 539.
Traumatic Torsion of Ovarian Pedicle: Medicolegal Study with Presentation of Cases and Review of Literature. H. Sneierson, Binghamton, N. Y.; J. Schlesinger, College Point, N. Y., and A. E. Gold, Binghamton, N. Y.—p. 546.

Impurities in Ether.—Bradshaw reports a case in which death in convulsions occurred during the administration of nitrous oxide-oxygen-ether. Some blood was obtained for examination before death. The blood showed an oxygen content of 6.9, oxygen capacity of 14.6, saturation of 47.3 and a carbon dioxide content of 61 volumes per cent. The concentration of sugar was 400 mg. per hundred cubic centimeters of blood (intravenous dextrose was being administered). The ether was analyzed and showed aldehyde present, 1:50,000 in two samples. No other impurities were found. Although 100 per cent oxygen was given for a period of ten minutes the cyanosis became greater and the convulsions continued. The oxygen content and capacity of the venous blood were low, with a low saturation. The carbon dioxide content was within normal limits. Excess carbon dioxide, hypoglycemia and lack of preoperative medication have been mentioned as causes of these convulsions. However, none of these conditions could have been active in this case. The only positive observation was a low oxygen content of the venous blood despite the administration of 100 per cent oxygen.

Appendicitis Complicated by General Peritonitis.—Williamson and Rankin treated thirty-two cases of appendicitis complicated by general peritonitis without a fatality. They attribute this result to the immediate removal of the appendix, after a reasonably brief period of preoperative preparation. Rapid evacuation of the septic material was secured by placing the patient in the ventral position. This rapid elimination of irritating material also tends to prevent postoperative adhesions and related postoperative complications. They prevented sepsis in the abdominal wound by leaving the wound open. Anaerobic bacteria cannot grow in air. If this factor were taken into consideration in the treatment of general peritonitis complicating appendicitis, it is doubtful that there would be need for bacterins, serobacterins, vaccines and the like against anaerobic bacteria. Thus the open wound prevents sepsis in abdominal wounds. Paralytic ileus is treated mainly by prevention. The ventral position aids considerably. The efficacy of prostigmine for this purpose has been demonstrated. This drug maintains the muscular tone of the intestine by preventing parasympathetic paralysis. In large doses it is a parasympathetic stimulant. In short, the peritoneum was closed down to the drains, the fascia and skin were left open and the wound was packed with gauze saturated with tincture of mercuric iodine, azochloramide or similar antiseptic. Deep through and through retention sutures were put in but left loose in order to pull the edges of the wound together gradually as the infection disappeared. When the patient was returned from the operating room he was immediately put on his abdomen and the head of the bed was elevated from 8 to 12 inches. Routine treatment consisted in hypodermoclysis of saline and dextrose solution and saline solution intravenously. An ampule of prostigmine was given every four hours and morphine was used for pain. Contrary to expectations the patients complained of little discomfort because of the position. The dressings were quickly saturated with the drainage from

the abdomen, necessitating frequent changing during the first twenty-four hours. The amount of discharge by far exceeded that of patients placed in the Fowler or other positions. This, because of rapid elimination of toxic material, undoubtedly accounted for the rapid drop in the temperature and pulse rate. As soon as they were tolerated, water and then liquids were given by mouth; after thirty-six to forty-eight hours the patient was put on his back. All patients were discharged from the hospital well after an average stay of 20.9 days and the wounds were healed, with the exception in a few cases of a small area at the site of the drains.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

23:549-684 (Sept.) 1939

- Some Problems in Control of Syphilis as a Disease. J. H. Stokes, Philadelphia.—p. 549.
*Treatment of Postarsphenamine Jaundice. L. J. Soffer, New York.—p. 577.
Malarial Treatment of General Paresis: Relation of Height, Duration and Frequency of Fever to Clinical and Serologic Results. I. Kopp and H. C. Solomon, Boston.—p. 585.
Sulfanilamide versus Sulfanilic Sulfanilamide in Gonococcal Infections. B. J. Walzak, Cleveland.—p. 597.
*Sulfanilamide in Chancroid Disease. R. B. Greenblatt and E. S. Sanderson, Augusta, Ga.—p. 605.
Death Following Mapharsen Therapy: Report of Case. S. D. Simon and A. Iglaue, Cincinnati.—p. 612.
Clinical Application of Twenty-Minute Staining Method for Spirochaeta Pallida in Tissue Sections. A. A. Krajian, Los Angeles.—p. 617.
Simplified Technic for Administering Old Arsphenamine: Report on 16,943 Injections Given at Vanderbilt Clinic. A. B. Cannon, New York.—p. 621.

Postarsphenamine Jaundice.—Since hepatitis is difficult to reproduce experimentally, its clinical treatment is based on empirical experience and therefore Soffer points out that the prevention and treatment of postarsphenamine jaundice assume increasing importance. When it is considered that from 5 to 10 per cent of the general adult population has syphilis, that a considerable number of this group is receiving antisyphilitic treatment and that in 1 per cent of this treated group jaundice will develop with a mortality rate varying from 1 to 6 per cent, there is reason for concern as to the proper methods of treatment. From a review of the clinical and experimental data presented in the literature concerning the treatment of arsphenamine jaundice it is seen that a high carbohydrate diet is well accepted as an important therapeutic measure. Such diets should consist of from 400 to 600 Gm. of carbohydrates daily. This should be divided into five or six feedings. As the sugars fructose and dextrose are most readily converted into glycogen by the liver, foods made up of these carbohydrates should be used. Thus the most desirable are cane sugar, which is hydrolyzed into dextrose; honey, which is mostly dextrose and fructose; and fruit juices. When the amount of carbohydrate taken orally is inadequate, diets should be supplemented by a constant intravenous drip of a 5 per cent solution of dextrose. Insulin is indicated only when glycosuria is present. The use of choleragogues and cholcretics in the treatment of arsphenamine jaundice is unsound.

Sulfanilamide for Chancroid.—Greenblatt and Sanderson have used sulfanilamide in the treatment of thirty-three cases of chancroid disease. The doses varied in individual cases, the average being from 400 to 500 grains (26 to 32.5 Gm.) of sulfanilamide. The by-effects were nausea, anorexia, dizziness and cyanosis. The twenty-seven ambulatory patients were usually given from twenty-five to forty tablets of sulfanilamide at a time with instructions for medication and to return every few days. Treatment was discontinued in one case because a rash developed, in two because of excessive vomiting and in one because of cyanosis. With cessation of treatment the untoward effects abated. Dizziness was the most frequent complaint, but treatment was never discontinued because of it. Surgical procedures other than aspiration of buboes were not performed. The therapeutic results, for the greater part, were so consistently good that the drug is regarded as a specific. The previously reported results of the British and American investigators are substantiated. Sulfanilamide proved more efficient than any of the standard methods in vogue. It succeeded in some cases in which vaccine therapy had failed.

Archives of Dermatology and Syphilology, Chicago

40: 521-686 (Oct.) 1939

- *Immunotherapy for Coccidioidal Granuloma: Report of Cases. H. P. Jacobson, Los Angeles.—p. 521.
- Pyoderma Gangraenosum, Onychogryphosis and Onycholysis with Ulcerative Colitis. Ida J. Mintzer, Jamaica, N. Y.—p. 541.
- Diseases of Skin in Oklahoma Indians. H. Fox, New York.—p. 544.
- Differential Diagnosis of Keratosis Blennorrhagica and Psoriasis Arthropathica. E. Epstein, Oakland, Calif.—p. 547.
- Dermatitis Nodularis Necrotica: Report of Case in Which Changes Characteristic of Lymphosarcoma Were Observed at Necropsy. H. A. Nieman, Dayton, Ohio, and F. Wise, New York.—p. 560.
- Active Spectral Range for Phytogetic Photodermatitis Produced by *Pastinaca Sativa* (Dermatitis Bullosa Striata Pratensis, Oppenheim). T. Jensen and K. G. Hansen, Copenhagen, Denmark.—p. 566.
- Dermatofibrosarcoma Protuberans: Report of Six Cases. G. W. Binkley, Cleveland.—p. 578.
- *Abscesses of Sweat Glands in Adults. P. Tachau, Chicago.—p. 595.

Coccidioidal Granuloma.—Theoretically, the ideal treatment of infectious diseases seems to be the administration of immunogenic antigens capable of activating the tissues and fluids to production of immune bodies. With this thought in mind, Jacobson decided to give vaccine treatment a trial in the management of coccidioidal disease. Since 1936 he has treated twenty-four cases of coccidioidal infection in its various clinical manifestations by this method. The character, extent of involvement and clinical course of the infection varied considerably. For the most part the clinical picture at the commencement of treatment was of the subacute variety. Evidence of past or present pulmonary involvement was present in the majority of cases. Next in frequency was involvement of the cutaneous-subcutaneous system, either as a primary manifestation or secondary to pulmonary or other systemic or structural coccidioidal disease. Involvement of bone was present in about 30 per cent of the cases. The aim of all therapeutic efforts was the raising of the patients' level of resistance to the existing infection. Accordingly, all febrile patients were kept in bed at complete rest. Nutritious and adequate diet, sunshine and fresh air played a definite part in the therapeutic regimen. Halibut liver oil with viosterol was given to all patients, and those seriously ill received injections of ascorbic acid daily or on alternate days. Anemic, dehydrated and undernourished patients also received blood transfusions, infusions of dextrose and parenteral injections of liver extract, according to clinical indications. Injections of vaccine constituted the specific part of the treatment. The vaccine was at first given subcutaneously, but later it was administered by the intravenous route. The standard initial dose has been 0.05 cc., and each succeeding injection has been increased by 0.05 cc. at intervals of from eight to fourteen days. In instances of unduly severe constitutional reaction, the dose of the succeeding injection was not increased and the interval was lengthened. A course consisted of from twelve to fifteen injections. Most patients received two or more courses of injections, punctuated by intervals of rest of from six to eight weeks. Five of the patients are still under treatment. Three are ambulatory and engaged productively but come to the office for injections of vaccine at regular intervals. All others have been discharged as fully recovered or are reporting regularly for observation. Two patients, one with widespread meningeal involvement and another suffering from the acute fulminating type of the disease, died. Specific immunogenic therapy is a rational procedure theoretically and has proved its worth clinically.

Abscesses of Sweat Glands.—Tachau reports 107 cases of sweat gland abscesses of the axilla. In 26 per cent a symmetrical involvement of both axillas was noted. In the others only the right or the left axilla was infected. In ten cases the abscess formation must be considered as a complication of local or generalized inflammatory dermatoses (contact dermatitis, eczema, epidermophytosis, erythrasma or arspenamine dermatitis). Two patients were observed with abscesses of the sweat glands secondary to scabies and furunculosis, and another with Bockhart's folliculitis. One patient had retrograde lymphangitis extending down the arm. In other regions the author never observed a coincidental or successive involvement of many apocrine glands. Thus, only single abscesses running an acute course were occasionally observed around the nipple, on the pubic area, on the labia majora and around the anus. The infection of the apocrine glands starts from the outside. Local

inflammatory processes, irritation by depilatories or shaving or the friction of tight clothing often favors the infection. They should never be considered as the actual causes. According to present knowledge, abscesses of the sweat glands are due to infection with *Staphylococcus pyogenes aureus* (and perhaps *albus* or *citreus*). The cultivation of streptococci or other germs from the abscesses does not prove their etiologic significance. The prognosis of abscesses of the apocrine glands is always favorable. The treatment of a single abscess consists in local application of dressings with a mild ointment (3 per cent of boric acid in petrolatum) or topovaccines, such as Sherman's mixed antiviral cream. Wet applications are not advisable, since they favor maceration and may give rise to the formation of new abscesses. As soon as softening occurs, a small incision is made for evacuating the pus. This is followed instantly by a quick and complete cure. Even in the axilla this simple treatment succeeds in uncomplicated cases. When the abscesses multiply and the patient is disabled, treatment with roentgen rays is the method of choice. In many cases a small dose suffices to give relief (from 100 to 120 roentgens, 70 to 80 kilovolts, filtered by 3 mm. aluminum; focal skin distance, from 25 to 30 cm.; diameter, from 10 to 15 cm.). Two or three days later the pain is usually gone. For more resistant lesions this dose must be repeated once or twice at intervals of ten days. Of thirty-seven patients treated since 1931 according to this technique, eight were cured after only one dose of from 100 to 120 roentgens; ten were cured after two exposures, or from 200 to 240 roentgens, while seventeen needed three exposures, or from 300 to 360 roentgens. In only two cases did considerable residual infiltrations or sinuses make it necessary to repeat the x-ray cycle after an interval of six or more weeks. Recurrences were never seen in this series.

Arkansas Medical Society Journal, Fort Smith

36: 87-102 (Sept.) 1939

- Relationship Between Heart Disease and Chronic Pulmonary Affections. C. T. Chamberlain, Fort Smith.—p. 87.
- Present Status of Antipneumococcus Serum and Sulfapyridine in "Management of Pneumonias." F. E. Schmidt, Chicago.—p. 91.
- Electrocardiography. S. A. Thompson, Camden.—p. 93.

Connecticut State Medical Society Journal, Hartford

3: 479-540 (Sept.) 1939

- Treatment of Burns. R. D. McClure, Detroit.—p. 479.
- Treatment of Wounds. A. H. Bissell, Stamford.—p. 484.
- Factor of Delay in Recognition of Common Surgical Conditions. E. Ottenheimer, Willimantic.—p. 487.
- Problem of Cleft Lip and Cleft Palate. C. C. Kelly, Hartford.—p. 490.
- Urogenital Deformities. C. H. Neuswanger, Waterbury.—p. 492.
- Congenital Orthopedic Deformities. A. S. Griswold, Bridgeport.—p. 494.
- Management of Congenital Defects of Nervous System. W. J. German, New Haven.—p. 498.
- Medical Air Raid Preparations in England. C. W. Goff, Hartford.—p. 504.

Johns Hopkins Hospital Bulletin, Baltimore

65: 223-290 (Sept.) 1939

- Actions of Procaine on Neuromuscular Transmission. A. M. Harvey, London, England.—p. 223.
- *Squamous Metaplasia, Stimulating Carcinoma, Associated with Prostatic Infection. O. S. Culp, Baltimore.—p. 239.
- Chemical Reactions of Nicotinic Acid Amide in Vivo. E. G. Ball, Baltimore.—p. 253.
- Relation of Psychiatry to Internal Medicine. T. A. C. Rennie, Baltimore.—p. 265.
- Use of Low Temperature Ball Mill for Preparation of Pollen Extracts. H. Eagle, C. Arbesman and W. L. Winkenwerder, Baltimore.—p. 283.

Squamous Metaplasia and Prostatic Infarction.—Squamous cell metaplasia and infarcts of the prostate have been described independently by several authors but Culp believes that the frequent coexistence of these two pathologic processes has been overlooked. In a recent routine study of a prostate removed by operation, islands of squamous epithelium were observed along the margins of three infarcts. The provisional diagnosis was early squamous cell carcinoma. Further study of the remainder of the prostate showed only typical glandular hyperplasia. Eight additional prostatic infarcts, occurring in seven different cases, were studied and in each instance similar histologic changes were seen, limited to the periphery of the infarcted areas. The uniformity of these observations indicates that benign metaplasia frequently is associated with prostatic infarction and may be misinterpreted as carcinoma.

Journal of the Mount Sinai Hospital, New York

6: 113-168 (Sept.-Oct.) 1939

- Function of Thymonucleic Acid in Living Cells. E. Hammarsten, Stockholm, Sweden.—p. 115.
- Psychic Factors in Recurrent Graves' Disease. S. S. Bernstein, New York.—p. 126.
- Roentgenkymography in Diagnosis of Myocardial Infarct, with Normal Electrocardiograms. M. L. Sussman, New York.—p. 130.
- *Angina Pectoris of Psychogenic Origin. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 134.
- Deficiency Syndrome and Diffuse Inflammation of Central and Peripheral Nervous System. J. Marmor, New York.—p. 138.
- A Chemist Looks at Surfaces. H. Sobotka, New York.—p. 141.
- Experimental Anticancerous Immunity. L. Gross, Paris, France.—p. 146.

Angina Pectoris of Psychogenic Origin.—Master and his associates point out that generally the anginal syndrome is caused by coronary artery disease and can be differentiated from a functional syndrome by the type of pain. In the organic type the pain is nearly always substernal and occurs as a rule after exertion, meals or excitement, whereas in the functional type the pain is usually over the precordium or nipple, often lasts longer and is not related to effort. In the main, this differentiation holds true but that angina of psychogenic origin may also be substernal and come on with exertion is illustrated by the case that they report. Although the anginal syndrome for which the patient (29 years of age) presented himself was characteristic of coronary artery disease and at one time was actually diagnosed coronary occlusion by a cardiologist, after four years it became obvious that it was merely the first symptom in what later became a well established neurotic complex. There certainly was no organic heart disease, for, after four years, the physical examination and all laboratory tests are normal. The authors are cognizant of the claim of some authors that angina pectoris due to coronary artery disease may be present in the absence of confirmatory evidence of any kind. However, they believe that this is rare if all tests are considered, particularly after a period of several years of observation. While the physical examination of the heart, fluoroscopy, electrocardiogram, exercise tolerance, and vital capacity may individually remain normal, it is improbable that all of these will do so. In the mechanism of pain in coronary artery disease a nervous mechanism is important, as even when organic coronary artery disease is present the frequency and severity of the anginal syndrome are greatly influenced by mental and emotional factors or, in the words of Heberden, "by passionate affections of the mind." Two patients with similar degrees of coronary artery disease may suffer pain of different severity, depending on the psychic makeup of each patient. Psychiatrists have emphasized the importance of the heart as the "specific sense organ of anxiety" and the close interrelation of the brain with the innervation of the heart. And, indeed, precordial pain is often the major symptom of a neurosis without organic basis. While the pain of organic heart disease is usually related to effort, not infrequently such an association is lacking. And pain of psychogenic origin may come on with effort occasionally. Exertion produces changes in pulse rate and contraction of the heart which in susceptible persons may cause sensations of pain, as was true of the patient presented. It is thus sometimes impossible to differentiate an anginal syndrome of organic origin from a functional one by the type of pain and its relation to effort.

Journal of Nervous and Mental Disease, New York

90: 297-428 (Sept.) 1939

- Form of Congenital Nyctonia in Goats. S. L. Clark, F. H. Luton and Jessie T. Cutler, Nashville, Tenn.—p. 297.
- Reactions and Behavior of Schizophrenic Patients Treated with Metrazol and Camphor. B. Glueck and N. W. Ackerman, Ossining, N. Y.—p. 310.
- Induction of Seizures by Closing of Eyes, or by Ocular Pressure, in a Patient with Epilepsy: Case Report. L. J. Robinson, Palmer, Mass.—p. 333.
- *Preliminary Observations on Course of Traumatic Psychoses. P. Hoch, New York, and E. Davidoff, Syracuse, N. Y.—p. 337.
- Unilateral Torsion-Dystonia: Clinicohistologic Study: Case. R. Gordin, Helsingfors, Finland.—p. 344.
- Death Associated with Metrazol Therapy: Report of Case. R. M. Fellows and F. Koenig, Osawatomie, Kan.—p. 358.

Course of Traumatic Psychoses.—In order to ascertain the prognosis and ultimate fate with regard to patients who became psychotic following head injury, Hoch and Davidoff investigated the records of 251 consecutive cases of traumatic

psychoses. The preponderance of cases in males (205) is due to the more frequent exposure of men to trauma and in part to occupational causes. Many of the traumatic psychoses were not psychoses due purely to the trauma alone but were associated with other conditions. Of the total number of cases 117 were complicated, in order of their frequency, by alcohol, cerebral arteriosclerosis, senility, neurosyphilis and other miscellaneous conditions such as mental deficiency and epilepsy. These complicating factors are of prognostic importance, as the prognosis is graver in these cases than in those in which no complicating factor exists. Senility and cerebral arteriosclerosis offer the gravest prognosis. The outlook is possibly rendered less hopeful in those cases in which there is an antecedent disturbance to the cerebral circulation. Besides the foregoing complicating concomitants there is another factor which has not been stressed sufficiently in relation to the traumatic psychosis group. An important prognostic determinant is the previous personality organization of the patient who has sustained an injury to the head. Of the schizoid personalities, 75 per cent were definitely unimproved. For patients more of the syntoid type, the prognosis was far better and the percentage of recovery and improvement greater. The ratio of unimprovement in the introvert type as compared to the extrovert type was approximately 2:1. Hallucinations and delusions were present in many cases but were not accompanied by neurologic phenomena characteristic of cortical or subcortical lesions. In the absence of these signs, it would be very difficult to attempt any localization of these psychic manifestations. While it is commonly known that hallucinations and delusions may occur in transitory form in any organic psychosis during the delirious state, they tend to disappear in concomitance with the improvement or recovery of a patient from the confusion or clouded state. In the traumatic psychoses, however, an important feature has been that a patient with a schizoid or introvert makeup regains his mnemonic functions and the approximate lucidity of his prepsychotic intellectual state but unharmoniously retains the hallucinations and delusions. Other factors no doubt enter into the clinical picture of the more protracted cases. In addition to the stresses and strains to which the patient is exposed and his reaction to change and thwartings, to financial and family situations, to occupation and to the important questions of compensation and litigation, attention should be focused on the previous personality makeup and what bearing this has on how the individual reacts to the situation. Also it is likely that study of the personality would greatly aid in the understanding of traumatic neuroses.

Journal of Pharmacology & Exper. Therap., Baltimore

67: 1-126 (Sept.) 1939. Partial Index

- Action of Sympathomimetic Amines in Cyclopropane, Ether and Chloroform Anesthesia. O. S. Orth, M. D. Leigh, C. H. Mellish and J. W. Stutzman, Madison, Wis.—p. 1.
- Pharmacology of Trimethyl Bismuth. T. Sollmann and J. Seifter, Cleveland.—p. 17.
- Analeptic Potency of Sympathomimetic Amines. M. L. Tainter, L. J. Whitsell and J. M. Dille, San Francisco.—p. 56.
- Action of Sulfapyridine (2-Sulfanilyl Aminopyridine). H. M. Powell and K. K. Chen, Indianapolis.—p. 79.
- Toxicity, Fats and Excretion of Propylene Glycol and Some Other Glycols. P. J. Hanzlik, H. W. Newman, W. Van Winkle Jr., A. J. Lehman and N. K. Kennedy, San Francisco.—p. 101.
- General Metabolic and Glycogenic Actions of Propylene Glycol and Some Other Glycols. P. J. Hanzlik, A. J. Lehman, W. Van Winkle Jr., and N. K. Kennedy, San Francisco.—p. 114.

Kentucky Medical Journal, Bowling Green

37: 377-422 (Sept.) 1939

- Responsibility of the Physician in Lunacy Inquests. J. G. Wilson, Frankfort.—p. 377.
- Clinical Diagnosis in General Practice. T. A. Griffith, Mount Vernon.—p. 381.
- Exhibits of the A. M. A. at St. Louis, May 1939. M. Casper, Louisville.—p. 385.
- Endocrine Therapy in Gynecology and Obstetrics. S. S. Gordon, Louisville.—p. 392.
- Annular Skin Lesions of Body Mistaken for Ringworm Infections. W. U. Rutledge, Louisville.—p. 396.
- Treatment of Infected Wounds. J. E. Hamilton, Louisville.—p. 398.
- Treatment of Carbuncles. A. D. Wilmoth, Louisville.—p. 402.
- Some of Newer Drugs and Their Uses. D. T. Roberts, West Point.—p. 406.
- Armamentarium of Cardiac Therapy. M. M. Weiss, Louisville.—p. 409.
- Hydronephrosis. L. Atherton, Louisville.—p. 412.

Maine Medical Association Journal, Portland

30: 213-246 (Sept.) 1939

- Hip Nailing. G. M. Morrison, Boston.—p. 213.
 Traumatic Shock. F. G. Balch Jr., Boston.—p. 216.
 Anesthesia for Traumatic Surgery. S. C. Wiggin, Boston.—p. 219.
 Tracheotomy: Bronchoscope as Aid in Emergency Cases. E. L. Pratt, Lewiston.—p. 222.

Michigan State Medical Society Journal, Lansing

38: 741-836 (Sept.) 1939

- Opportunities for Continuous Medical Education in Wayne County. R. B. Allen, Detroit.—p. 759.
 Congenital Dislocation of Hip. F. C. Kidner, Detroit.—p. 762.
 Pyometritis Associated with Metromenorrhagia. C. B. Loranger, Detroit.—p. 768.
 Limitations of Transurethral Prostatectomy. R. M. Nesbit, Ann Arbor.—p. 770.
 Nontuberculous Pneumothorax Proved by Autopsy: Case. R. L. Fisher, Detroit.—p. 774.

Military Surgeon, Washington, D. C.

85: 197-276 (Sept.) 1939

- Syphilis and Mobilization. W. F. Lorenz and W. J. Bleckwenn.—p. 197.
 Activities of Military Surgeons in International Congresses of Military Medicine and Pharmacy. W. S. Bainbridge.—p. 211.
 Oral Pain as Factor in Diagnosis. H. B. Dierdorff.—p. 216.
 Treatment of Lobar Pneumonia with Serum and Sulfanilamide. H. P. Marvin and E. P. Campbell.—p. 224.
 Army Medicodental Relationship. W. I. French.—p. 232.
 Anxiety Neurosis. M. E. Segal.—p. 239.
 Cold and Heat Therapy in Dentistry. C. C. Ellison.—p. 241.

Minnesota Medicine, St. Paul

22: 595-666 (Sept.) 1939

- Tuberculosis Problem Viewed in the Light of Recent Pathologic Studies. H. C. Sweany, Chicago.—p. 595.
 Treatment of Vaginal Discharges. E. D. Plass, Iowa City.—p. 610.
 Placenta Accreta. J. C. Feuling, Bovey.—p. 615.
 Cerebral Calcification (Parkes Weber-Dimitri Type). G. R. Kamman, St. Paul.—p. 618.
 Parenteral Administration of Fluids: Principles and Indications in Surgical Treatment. M. A. Falconer, Rochester.—p. 621.
 *Carbon Monoxide: A Public Health Hazard. L. B. Franklin, Minneapolis.—p. 628.
 The Medical Library: A Laboratory for the Literary Physician. T. E. Keys, Rochester.—p. 633.
 Traumatic Inguinal Hernia. S. R. Maxeiner and H. E. Hoffert, Minneapolis.—p. 636.
 Pseudodiaphragmatic Shadow Due to Pleural Fluid. O. Lipschultz, Minneapolis.—p. 638.

Public Health Hazard of Carbon Monoxide.—The hazards of carbon monoxide to public health are discussed by Franklin, who states that ordinarily it does not appear in nature but results almost entirely from incomplete oxidation of carboniferous material. It has been reported to have been formed in large amounts during severe electrical storms and to have been produced by growing kelp. It is present when buildings burn, is produced in lime, brick and charcoal kilns, is present following explosions and fires in mines and it is also produced on detonation of high explosives. In the laboratory it is produced by heating formic or oxalic acid with sulfuric acid. It is found in smoke and in compartments which have been painted with oil paints and sealed. It has even been reported formed from burning cigarettes. About 16 per cent of coal gas is carbon monoxide, 28 per cent of blast furnace stack gas, from 1 to 8 per cent of mine air after dust explosions is carbon monoxide and about 7 per cent of the exhaust from automobile motors. The author points out that 5 per cent of the cars tested on the highways by Van Deventer showed a dangerous concentration (0.03 per cent or more) of carbon monoxide in the air that the driver breathed. The public should be educated on all phases of the hazard, and especially those likely to come in contact with a high concentration of carbon monoxide, such as firemen and policemen. It should be able to recognize symptoms, know the incidence and be able to give first aid. Statistics should be compiled and made available to the public. Methods of accurately detecting injurious amounts of the gas in air should be developed and the public educated in detecting the gas in homes, garages, motor cars and other places. A possible solution of this point could be that the gas companies when installing gas in a home or apartment be required to supply each patron with a piece of apparatus for detecting leaking gas. There should be more experimentation to determine better methods of treatment. Legislation should be enacted for the elimination of the hazard in factories, public garages, mines and wherever there are employees. Such legislation should be supplemented by regular inspection under public health jurisdiction.

Missouri State Medical Assn. Journal, St. Louis

36: 353-382 (Sept.) 1939

- Late Advances in Diseases of Pancreas. W. H. Cole, Chicago.—p. 351.
 The Female Sex Hormones: A Digest. F. H. Scharles and A. Sophia, Kansas City.—p. 359.
 Ophthalmia Neonatorum. L. C. Drews, St. Louis.—p. 366.
 Loss of Eyesight in Children Due to Refractive Errors and Crossed Eyes. W. L. Post, Joplin.—p. 368.
 Congenital Syphilis and Its Effect on Eyesight. P. S. Luedde, St. Louis.—p. 371.
 *Causes and Prevention of Blindness in Adults: Role of the General Practitioner. J. McLeod, Kansas City.—p. 372.
 Industrial Eye Injuries and Hazards: Their Prevention and Treatment. R. E. Mason, St. Louis.—p. 373.
 Conservation of Eyesight. C. P. Dyer, St. Louis.—p. 374.

Blindness in Adults.—In discussing the prevention of blindness in adults, McLeod examines a typical set of statistics, the tabulation of 11,852 cases of blindness in Pennsylvania. When all congenital anomalies, for which treatment is of little avail in any case, traumatism, all external infections (except gonorrheal conjunctivitis but excluding ophthalmia neonatorum) and all predominantly juvenile diseases are excluded a total of 87 cases remains. If ulcerative keratitis (194) is also eliminated on the assumption that all cases were due to external infection and all cases of senile cataract (2,666) there remain 5,919 cases of blindness due to general disease. It is questionable if senile cataract should be omitted, since under this diagnosis we classified all cases of diabetes in which the cataracts develop after the age of 50 and since complete blindness with cataract depends on some retrolenticular disturbance. Breaking down this figure of 5,919 cases due to general disease gives the following incidence: uveitis (all causes) 25.3 per cent, choroiditis 8.2 per cent, chronic glaucoma 24.8 per cent, acute glaucoma 1.9 per cent, vascular diseases (including diabetic and nephritic retinitis) 10.6 per cent, optic atrophy 20.3 per cent and neuritis 5 per cent. This group makes up a total of 96.1 per cent of the 5,919 cases. If from this group glaucoma is excluded there is still 69.4 per cent of these cases (approximately 35 per cent of the total number) the origin of which lies in some systemic condition with focal infection, vascular disease, syphilis and tuberculosis predominating. The importance of watching for early optic nerve changes in syphilis cannot be too strongly emphasized. Here, as in glaucoma, the disease may progress to a dangerous point before visual acuity is noticeably diminished particularly if the patient is not too intelligent. Recognition of the possible causal agents of certain eye conditions, notably iritis and uveitis, is of great help in searching for the probable factor (usually focal infection or syphilis) responsible for them. Knowledge of the ophthalmologic pictures in chronic disease involving the vascular systems is of help in formulating the diagnosis and prognosis of these conditions. Nothing can be done about them by local measures and their treatment resolve itself into treatment of the underlying disease.

New England Journal of Medicine, Boston

221: 367-402 (Sept. 7) 1939

- Carcinoma of Fallopian Tube. L. Parsons, Boston.—p. 367.
 Evolution of Treatment of Pulmonary Tuberculosis at the Rutland State Sanatorium. P. Dufault, Rutland, Mass.—p. 374.
 Calculus Formation in Urethral Diverticulum in a Woman: Report of Case. E. A. Gaston and J. Ferrucci, Framingham, Mass.—p. 379.
 *Meningitis Due to Micrococcus Tetragenus: Report of Case with Recovery Following Treatment with Sulfanilamide. M. Crisafulli Jr., Pittsfield, Mass.—p. 383.
 Radiation Therapy. R. Dresser, Boston.—p. 386.

Meningitis Due to Micrococcus Tetragenus.—Crisafulli reports a case of meningitis due to *Micrococcus tetragenus* with recovery. A lumbar puncture was done, and the morphology, the staining reaction and the cultural characteristics of the organisms were consistent with those of *Micrococcus tetragenus*. Ordinarily this organism is found in the nose and throat, where it is not considered to be pathogenic. Although this patient gave no history of infection of the upper part of the respiratory tract, it is likely that the organism gained entrance to the central nervous system from the right ethmoid sinus. Therefore, one should carefully examine the upper part of the respiratory tract for possible foci of infection in these cases. A blood culture was not done on the day of admission. Although one taken seven days later was negative, the patient had already been taking sulfanilamide for five days. The author is of the opinion that in this type of meningitis one is not deal-

ing with a virulent type of organism and that if the patient can be kept alive until he has manufactured enough immune bodies he will recover. Were the author again faced with the same situation, he states that he should look for possible foci of infection in the upper part of the respiratory tract, give supportive treatment, do a lumbar puncture as often as indicated by the patient's condition and give sulfanilamide in adequate doses.

New Orleans Medical and Surgical Journal

92:113-170 (Sept.) 1939

- The Medical Profession: A Businessman's Point of View. E. D. Rapiet, New Orleans.—p. 113.
Toxic Effects of Sulfanilamide and Sulfapyridine. C. Brooks, New Orleans.—p. 115.
Emotional Factors in Disease. T. A. Watters, New Orleans.—p. 118.
Diagnostic Survey of the Allergic Patient. N. K. Edrington, New Orleans.—p. 125.
The Eye and Its Care. L. F. Gray, Shreveport, La.—p. 131.
Use of Anatomicophysiology Incision in Appendicitis. H. S. Coon, Monroe, La.—p. 135.
Diagnosis and Treatment of Diabetes. M. Gardberg, New Orleans.—p. 137.
Management of Diabetic Acidosis and Diabetic Coma in a General Hospital. H. J. Frachtman, New Orleans.—p. 143.
Bacillus Pyocyanus Meningitis: Report of Six Cases. R. A. Wise and J. H. Musser, New Orleans.—p. 145.

New York State Journal of Medicine, New York

39:1707-1816 (Sept. 15) 1939

- *Treatment of Types V, VII and VIII Pneumococcus Pneumonia with Rabbit Antipneumococcus Serum. E. H. Loughlin, R. H. Bennett and S. H. Spitz, Brooklyn.—p. 1713.
Treatment of Type III Pneumococcus Pneumonia with Sulfanilamide. R. H. Bennett, S. H. Spitz and E. H. Loughlin, Brooklyn.—p. 1722.
Industrial Low Back from Orthopedic Standpoint. S. Kleinberg, New York.—p. 1725.
Neurologic Aspects of Backache. E. D. Friedman, New York.—p. 1734.
Herniation of Nucleus Pulposus and Hypertrophied Ligamenta Flava. D. M. Bosworth and C. C. Hare, New York.—p. 1739.
Unidentifiable Bacillus Lignieri and Pasteurella. J. I. Schleifstein and Mari.—p. 1741.
Evaluation of Jaughlen Test in Diagnosis of Syphilis: Report Based on 2,005 Tests. J. Churg and N. Sobel, New York.—p. 1754.
Indications for Estrogen Therapy: Including a Preliminary Report on Use of Two New Estrogen Preparations (Estradiol Dipropionate and Diethyl Stilboesterol) and Subcutaneous Implantation of Crystalline Estradiol Benzoate. S. H. Geist and U. J. Salmon, New York.—p. 1759.
Dispensary Diabetics. A. H. Terry Jr. and S. Folk, New York.—p. 1768.
Some School Hearing Surveys, Analysis and Observations. E. M. Freund, Albany.—p. 1770.
Treatment of Acute Encephalitis by Intravenous Injection of Hypotonic Salt Solution. G. M. Retan, Syracuse.—p. 1774.
Vaccine Therapy in the Rheumatic Patient. H. Weiner, Brooklyn.—p. 1786.
Evaluation of Sulfanilamide Therapy in Acute Otitis Media and Mastoiditis. J. C. Scal, New York.—p. 1790.
Irradiation as Adjunct to Surgery in Substernal Thyroid: Response of Recurrent Fetal Adenoma. I. I. Kaplan and S. Rubinfeld, New York.—p. 1795.

Rabbit Serum for Pneumonia.—Loughlin and his colleagues used unconcentrated and refined rabbit antipneumococcus serum in the treatment of forty-one patients with pneumonia due to the type V pneumococcus, forty-six due to the type VII organism and thirty-eight with type VIII pneumonia. In the first group the pneumonia had been present for an average of ninety hours, with extremes of twenty-six and 192 hours, before rabbit serum was administered. Nine patients had bacteremia when first seen. The average dose of rabbit serum was 290,000 units, and crisis occurred in an average of fourteen hours. Forty patients recovered, and one died. This patient, who was not given serum until 120 hours after onset, died apparently during a thyroid crisis. Thirty-two patients, six of whom had bacteremia, were successfully treated with one dose. In these patients, crisis occurred in an average of eight and one half hours; the average single dose was 246,000 units. The blood stream was sterilized in every instance after the administration of the projected dose. Serum sickness developed in eleven patients. In the patients with pneumonia due to pneumococcus type VII the disease had been present for an average of eighty-three hours, with extremes of twenty and 192 hours, before rabbit serum was administered. Sixteen patients had bacteremia on admission. The average amount of rabbit serum given was 340,000 units. Crisis occurred in an average of fifteen hours. Forty-four patients recovered and two died. In these two fatal cases a severe bacteremia was found and serum therapy was delayed until ninety-six and 144 hours, respectively. One patient was moribund on admission, had pulmonary edema and died

within twelve hours after treatment with serum was begun. Thirty-six patients, seven of whom had bacteremia, were successfully treated with one dose. In these patients, crisis occurred in an average of nine and one half hours; the average single successful dose was 279,000 units. The blood stream was sterilized in every instance after the projected dose. Serum sickness developed in nine patients. In the remaining thirty-eight patients the type VIII pneumonia had been present for an average of seventy-nine and one half hours, with extremes of fifteen and 336 hours, before rabbit serum was administered. Twelve patients had bacteremia on admission. The average amount of rabbit serum given was 300,000 units. Crisis occurred in an average of twelve hours. All the patients recovered. Thirty-four patients, of whom nine had bacteremia, were successfully treated with one dose. In these patients, crisis occurred in an average of ten hours; the average single successful dose was 269,000 units. The blood stream was sterilized in every instance after the administration of the projected dose. Serum sickness developed in nine patients. This generally consisted of fever, urticaria and arthritis. These symptoms usually were mild or moderate in severity, although in a few instances a rather severe arthritis was noted. There were no instances of lymphadenitis. The authors conclude that the effectiveness of any therapy in pneumonia depends on (1) the rapidity with which it can destroy the pneumococci in the tissues of the lung and in the blood stream, (2) how quickly it can neutralize the toxins and reduce the toxemia, (3) the rapidity with which it can supply pneumococcus antibodies or stimulate their formation and (4) the absence of untoward reactions that would endanger the patient's life. They find that the homologous unconcentrated and refined rabbit antipneumococcus serum fulfills these requirements in the treatment of types V, VII and VIII pneumonia.

Ohio State Medical Journal, Columbus

35:913-1032 (Sept.) 1939

- Present Status of Silicosis. A. J. Lanza, New York.—p. 929.
Fainting Attacks: Mechanism and Treatment of Certain Clinical Types. E. B. Ferris Jr., Cincinnati.—p. 933.
End Results Following Common Duct Obstruction. F. M. Douglass, Toledo.—p. 938.
Vitamins in Ophthalmology and Otolaryngology: Review of Recent Experimental and Clinical Observations. W. H. Evans, Youngstown.—p. 944.
Facts and Theories of Nasal Disease. R. J. Frackelton, Lakewood.—p. 949.
Statistical Study of Alcoholic Psychoses. N. W. Kaiser, Toledo.—p. 952.
Exploded Theories of Ovulation: Various Notions on When Ovulation Occurs and Their Bases. R. D. Bryant, Cincinnati.—p. 955.
Important Features in Treatment of Fractures. A. F. Vossell, Baltimore.—p. 959.
Acute Abdominal Pain. E. A. Marshall, Cleveland.—p. 966.
Allergy and Nutrition. J. Forman, Columbus.—p. 973.

Pennsylvania Medical Journal, Harrisburg

42:1425-1648 (Sept.) 1939

- Syphilis Acquired from Transfusion and Its Control. F. J. Eichenlaub and R. Stolar, Washington, D. C.—p. 1437.
Rational Application of Sulfanilamide Therapy to Streptococcal Infections. J. S. Lockwood, Philadelphia.—p. 1444.
Mechanism and Management of Surgical Shock. N. E. Freeman, Philadelphia.—p. 1449.
Scope and Problems of Plastic Surgery. H. May, Philadelphia.—p. 1453.
Growth in Diabetic Children. J. H. Barach, Pittsburgh.—p. 1459.
Chemotherapy in Treatment of Urinary Tract Infections. S. H. Johnson 3d, Pittsburgh.—p. 1468.
Chemotherapy in Septicemia. F. G. Harrison, Philadelphia.—p. 1473.
Chemotherapy of Gonorrhea in the Male. F. P. Massaniso and F. S. Schofield, Philadelphia.—p. 1476.
Treatment of Tuberculosis in the Commonwealth of Pennsylvania. Edith MacBride-Dexter, Sharon, and M. Behrend, Philadelphia.—p. 1481.
Role of the Pediatrician in Relation to Surgery. J. Crump, Philadelphia.—p. 1492.
Etiology of Hydronephrosis. B. C. Blaine, Pottsville.—p. 1498.

Public Health Reports, Washington, D. C.

54:1587-1624 (Sept. 1) 1939

- "Influences" of Breast Cancer Development in Mice. J. J. Bittner.—p. 1590.
Influence of Foster Nursing on Incidence of Spontaneous Breast Cancer in Strain C³H Mice. H. B. Andervont and W. J. McElency.—p. 1597.
Effects of Ox Bile and Estrin on Development of Tumors in Mice. F. C. Turner.—p. 1603.

54:1625-1662 (Sept. 8) 1939

- Dental Programs Sponsored by Health Agencies in Ninety-Four Selected Counties. J. W. Mountain and Evelyn Flook.—p. 1625.
Solubility of Lead Arsenate in Body Fluids. L. T. Fairhall.—p. 1636.
Breast Cancer and Pedigree Relationship of Fostered A Stock Mice. J. J. Bittner.—p. 1642.

Rhode Island Medical Journal, Providence

22: 147-160 (Sept.) 1939

Selection of Patients for Surgery. E. C. Cutler, Boston.—p. 147.

South Carolina Medical Assn. Journal, Greenville

35: 217-242 (Sept.) 1939

Acute Intussusception with Intermittent Spontaneous Reduction and Recurrence. R. F. Zeigler Jr., Seneca.—p. 217.
Review of Cesarean Sections in Greenville County. R. M. Dacus Jr., Greenville.—p. 219.**Southern Medical Journal, Birmingham, Ala.**

32: 891-982 (Sept.) 1939. Partial Index

Compound Fractures and Their Treatment. A. T. Moore and J. T. Green, Columbia.—p. 891.

Orthopedic Care of Convalescent Poliomyelitis: Report of Sixty-Three Cases One Year Following Acute Onset. W. V. Newman, Little Rock, Ark.—p. 900.

Metastatic Cancer in Lymph Nodes of Neck. H. G. F. Edwards, Shreveport, La.—p. 905.

Cancer of Larynx and Its Treatment by Total Laryngectomy. S. Israel, Houston, Texas.—p. 911.

Sickle Cell Anemia with Cerebral Thrombosis. A. I. Josey, Columbia, S. C.—p. 915.

Extragenital Granuloma Venereum: Report of Case. E. R. Pund, A. D. Smith, D. Y. Hicks and R. B. Dienst, Augusta, Ga.—p. 917.

Congenital Factor in Acquired Diverticulosis of Jejunum and Ileum. G. H. Bunch, Columbia, S. C.—p. 919.

Head Injuries. A. W. Adson, Rochester, Minn.—p. 926.

Treatment of Congenital Syphilis with Intravenous Arsenical: Analysis of 204 Clinical Cases. J. K. Howles, New Orleans.—p. 940.

Purpura Annularis Telangiectodes: Report of Two Additional Cases. E. R. Hall and V. A. Hall, Memphis, Tenn.—p. 953.

*Nonpollen Factors Simulating Seasonal Respiratory Allergy. H. E. Prince, Houston, Texas.—p. 956.

Industrial Hygiene as a Function of a State Department of Health. G. W. Cox and C. A. Nau, Austin, Texas.—p. 960.

Nonpollen Factors Simulating Seasonal Allergy.—Prince discusses some of the so-called miscellaneous factors that have been so important in several of his cases that they must be regarded as the primary excitants in what otherwise appeared to be true pollinosis; in other instances they have assumed equal importance with pollens in determining seasonal symptoms. As a basis for this report he has selected 150 patients with respiratory allergy studied during the past two years. Of these, ninety-two have symptoms in one or more well defined seasons and fifty-eight have definite yearly seasonal exacerbations. Symptoms of this group are distributed as follows: asthma thirty-eight, hay fever seventy-five and hay fever and asthma thirty-seven. Grass is the most important seasonal inhalant factor (91 per cent) encountered in the spring, followed by trees with 58 per cent. But also 54 per cent of the spring patients reacted to air-borne molds, 71 per cent to danders, 83 per cent to house dust and 25 per cent to orris root, while only 5 per cent reacted to pyrethrum. Similarly 92 per cent of summer patients reacted to grass, and almost as many to house dust (88 per cent) and danders (66 per cent) as in the spring group. However, the percentage of mold reactions is 75, compared with 54 for the spring; orris root is about the same (28 per cent) and pyrethrum is increased to 17 per cent. In the fall group 90 per cent reacted to ragweed, 72 per cent to grass and 26 per cent to chenopodiales; to other factors, reactions occurred as follows: dust 90 per cent, molds 68 per cent, danders 62 per cent, orris root 21 per cent and pyrethrum 7 per cent. In the winter only 35 per cent reacted to pollens (trees), while 98 per cent were sensitive to house dust; 77 per cent reacted to danders, 66 per cent to molds, 35 per cent to orris root and 14 per cent to pyrethrum. In none of the four major seasons, then, can pollens be considered as the entire cause of symptoms. Therefore more attention should be given nonpollen factors which may complicate what appear to be simple cases of seasonal allergy.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

47: 507-560 (Sept.) 1939

Relationship Between Cause and Distribution of Spasticity in Childhood. S. F. Stewart, Los Angeles.—p. 507.

Infective Prostatitis: Critical Review. W. R. Jones, Seattle.—p. 511.
Mucocoele of Appendix: Report of Twelve Cases. J. C. Doyle, Beverly Hills, Calif.—p. 515.

Treatment of Severe Thyrotoxicosis. W. O. Thompson, S. G. Taylor 3d, R. W. McNealy and K. A. Meyer, Chicago.—p. 522.

Recurrent Toxic Goiter. R. F. Bowers, New York.—p. 536.

Surgical Approach to Hypertension: Division VIII. F. M. Findlay, San Diego, Calif.—p. 543.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

20: 297-370 (Aug.) 1939

Purification of Diphtheria Toxoid. C. G. Pope and F. V. Linggood.—p. 297.

Effect of Foreign Tissue Extracts on Efficacy of Influenza Virus Vaccines. C. H. Andrews and W. Smith.—p. 305.

Experimental Acute Perchloride Intoxication. G. L. Montgomery.—p. 316.

Purification of Insect-Transmitted Plant Viruses. F. C. Bawden and N. W. Pirie.—p. 322.

Pantothenic Acid and Growth of Streptococcus Haemolyticus. H. McIlwain.—p. 330.

Glutamine and Growth of Bacteria. P. Fildes and G. P. Gladstone.—p. 334.

Extravascular Development of Monocyte Observed in Vivo. R. H. Elett and H. W. Florey.—p. 342.

Metabolism of Lactic Acid in Diphtheritic Toxemia. C. R. Dawson and E. Holmes.—p. 357.

British Journal of Urology, London

11: 207-304 (Sept.) 1939

Cysts of Kidney Due to Hydrocalycosis. K. H. Watkins.—p. 207.

*Role of Vitamin A Deficiency in Etiology of Renal Calculus. K. Long and L. N. Pyrah.—p. 216.

Pycnographic Reactions. T. Moore.—p. 233.

Vitamin A Deficiency and Renal Calculus.—Long and Pyrah studied twenty-five cases of upper urinary lithiasis for vitamin A deficiency together with sixty-five control subjects drawn from healthy people of different economic grades of society. Whereas 75 per cent of the control subjects gave a normal dark adaptation reading, only 36 per cent of the patients who had suffered from urinary lithiasis showed normality. The reading of the remaining 25 per cent of the normal individuals fell just short of the required standard of normality. There were no definitely subnormal readings, whereas among the 64 per cent of the patients suffering from urinary lithiasis 24 per cent were slightly subnormal and 40 per cent were definitely subnormal. After concentrated vitamin A therapy (13,000 units daily for four or five weeks) given to selected patients, 42 per cent gave normal and 58 per cent subnormal readings. One or two patients showed a slight improvement, but this proportion was small and 33 per cent remained definitely subnormal. Therefore dietary deficiencies alone cannot account for the differences in readings between the selected patients and the control subjects, and it would certainly appear from the results that a low body reserve of vitamin A is commoner among patients who had had a urinary calculus even at some interval after operation than among other ordinary healthy members of the community. The results are somewhat similar to those of Ezickson and Feldman, and of Higgins, although the authors state they are not so definite. Too much importance must not be attributed to the vitamin A deficiency found among the 40 per cent of the patients with urinary lithiasis. The general evidence and the results point to this deficiency as only a contributory part in the etiology of urinary lithiasis. At the same time it is interesting that a course of vitamin A therapy had such poor results in raising the vitamin A reserves among the patients, when it is known that such therapy among people who are suffering from dietary deficiencies can usually effect improvement in two or three weeks. Various explanations have been advanced to explain these facts. The deficiency might be explained by excretion of vitamin A in the urine. The deficiency and its apparent inability to be remedied by the oral administration of the vitamin may be perhaps the result and not the cause of the disease and may be related to impairment of kidney function which may be found in some of these patients. This hypothesis the authors believe is worth further investigation. Those selected patients with a short clinical history and no evidence of derangement of kidney function and those with either slight or no infection of the urine before operation usually gave normal readings. On the other hand, those with a long clinical history with its possible effects on the kidney tissue or those who presented evidence of long standing chronic urinary infections, with blood, albumin and bacteria in the urine before operation, generally gave definitely subnormal readings. If this hypothesis were true, it would also provide an explanation for the normal dark adaptation reading of some of the patients

and for the lack of improvement among the subnormal ones after vitamin A therapy. The urine of eight definitely subnormal patients was tested for the presence or absence of vitamin A and also any obvious evidence of impaired kidney function was observed. This investigation failed to show any definite evidence of gross renal damage and in no case was vitamin A to be found in the urine. It seems, therefore, that loss of vitamin A by excretion in the urine cannot account for the low vitamin A reserves found in these cases of renal calculi, and it would appear that the deficiency is more likely to be correlated, as already postulated by Jeghers and Moore, with some defect in the metabolism of the patient or with an inability to absorb the vitamin from the diet. Nevertheless, it is the authors' intention to continue with these investigations on similar patients before operation so that the degree of the importance of this vitamin A deficiency in urinary lithiasis can be interpreted more exactly.

Edinburgh Medical Journal

4G: 581-612 (Sept.) 1939

- Disseminated Sclerosis: Review of Modern Work on Its Etiology. A. J. Rhodes.—p. 581.
Periodicity of Influenza. J. H. D. Webster.—p. 591.

Indian Medical Gazette, Calcutta

74: 449-512 (Aug.) 1939

- Rat Bite Fever in Calcutta. R. N. Chopra, B. C. Basu and S. Sen.—p. 449.
Treatment of Lobar Pneumonia with Sulfapyridine. A. Caplan.—p. 451.
Treatment of Nervous Diseases by Vitamin B₁, with Special Reference to Trigeminal Neuralgia: Report of Seven Cases. I. Bakhsh.—p. 456.
Infection with Giardia Lamblia: Its Pathogenicity and Treatment. R. N. Chopra, B. M. Das Gupta, B. Sen and Z. Ahmed.—p. 458.
Difficulties and Dangers in Providing Donors of Blood. S. D. S. Grevall and S. N. Chandra.—p. 461.
Chordoma. M. N. De and B. P. Tribedi.—p. 465.
Certain Cyclic Changes Observed in Blood Pictures of Cases of Untreated Anemia Complicating Pregnancy in Tea Estate Coolies. K. P. Hare.—p. 467.
Experimental Malaria Infections in Two Races of Anopheles Stephensii. P. F. Russell and B. N. Mohan.—p. 469.
Ionizable Iron in Cow's and Mother's Milk. J. C. Pal.—p. 470.
Five Years of Antimalaria Work at Barwadih Railway Settlement. N. Ahmed.—p. 472.
Moniliasis with Secondary Allergic Patch or Monilide: Case. L. M. Ghosh.—p. 476.

Thiamin Chloride for Trigeminal Neuralgia.—Seven cases of trigeminal neuralgia have been treated with thiamin chloride and Bakhsh states that in six of these improvement ranged from 100 (in four) to 30 per cent. The patient who did not respond to this therapy gave a history of syphilis and although the Wassermann reaction was negative he was given a course of mercuric and iodides by mouth without any relief. The four patients who were completely relieved received 160, 210, 84 and 90 mg. of thiamin chloride each and in all of them improvement commenced promptly and in two it was complete when only 50 mg. of the vitamin had been given, although treatment was continued for a few days more. The author has also used thiamin chloride in doses of 10 mg. daily in a case of early disseminated sclerosis for more than one month without the slightest improvement. In another case of diabetic polyneuritis, oral and parenteral administration of from 10 to 20 mg. of the vitamin without insulin for one month produced no effect on the sensory changes; in fact, the patient complained of an exaggeration of tingling and burning sensations in the hands and feet. When his urine became sugar free after insulin therapy he was relieved within a few days. Two cases of arsenical neuritis were uninfluenced by prolonged thiamin chloride therapy, although similar dosage in four cases of polyneuritis of unknown origin produced satisfactory results and the improvement was noticeable in the first week of treatment. One patient with nerve deafness did not respond to six weeks of treatment given by mouth as well by injection. The clinical data are too scanty to evaluate its efficacy in all the diseases for which it is advocated but it seems to be of particular value in many forms of polyneuritis. Whether the action of the vitamin is due to its replacing any deficiency or to some other action is not quite clear yet.

Ionizable Iron in Milk.—Pal determined the available iron in ten different samples of cow's milk from a dairy, a local milkman and a local market and two mixed samples of mother's milk. Almost all the iron present in milk is in available form.

The average available or ionizable iron content in the cow's milk was 0.635 mg. per hundred cubic centimeters of milk. This is almost equal to the total iron present in the samples. The mean figure for ionizable iron in mother's milk was also almost the same as the total iron present and was found to be 0.625 mg. per hundred cubic centimeters of mother's milk.

Lancet, London

2: 629-674 (Sept. 16) 1939

- *Postoperative Thrombosis and Embolism: Mortality and Morbidity. R. Pilcher.—p. 629.
Erythrocytes-Plasma Interface and Consequences of Its Diminution. R. Fähræus.—p. 630.
"Influenza" Meningitis Treated with Sulfapyridine: Report of Two Cases. E. H. Roche and J. E. Caughey.—p. 635.
Valvular Pneumothorax: Treated by Mechanical Valve and Obliterative Pleurisy. F. G. Chandler.—p. 638.
*Iron Administration and Hemoglobin Levels During Pregnancy. E. M. Widdowson.—p. 640.
Prophylactic Inoculation During Incubation Period. H. Schütze.—p. 643.

Postoperative Thrombosis and Embolism.—Pilcher says that a careful study has been made at the University College Hospital in London for cases of thrombosis and embolism. The records of the decade from 1929 to 1938 have been analyzed to show the interrelation of thrombosis and embolism, and the mortality of the latter. Prophylaxis was tried in the series presented, but no specific treatment except embolectomy in one case. Regarding the criteria of diagnosis the author says that in both thrombosis and embolism there is a rise of temperature. In simple thrombosis the rise is seldom of more than 1.5 degrees F., but when embolism occurs the temperature rises higher. The rise of temperature in a case of embolism often precedes the symptoms and may be presumed to be due to undetected thrombosis. The signs on which thrombosis is diagnosed are delayed cooling on exposure, pain and tenderness, edema, slight cyanosis and fullness of superficial veins. Of these the most constant are tenderness and delayed cooling; these in conjunction with a rise of temperature would be regarded as evidence of thrombosis. The signs of thrombosis enumerated were not all present in every case. In the diagnosis of embolism little importance is attached to the presence of recognized thrombosis, and, in fact, in the majority of cases no thrombosis was found. Unless, therefore, gross errors are made in the diagnosis of embolism, it must be accepted that many cases of thrombosis are not diagnosed. The fact that thrombosis may be latent makes it difficult to assess its risks on the evidence of diagnosed cases. Pulmonary embolism in addition to fever has three important features: pain, hemoptysis and signs of pleurisy or consolidation. The 261 cases of thrombosis and embolism that are discussed here are analyzed in several tables. The first table lists ninety-eight cases of femoral or iliac thrombosis only, forty-three cases of thrombosis with nonfatal embolism, sixty-eight cases of nonfatal embolism with recognized thrombosis, forty-four cases of fatal embolism and eight cases of thrombosis or embolism which were diagnosed in life but in which death resulted from other causes. The second table analyzes the material from the point of view of association of thrombosis and embolism and the third table lists the mortality rates. The mortality rate of the whole series was 16.8 per cent. The mortality rate of the first attack of embolism was 21.6 per cent. The total mortality rate of embolism was 28 per cent. Fatal embolism followed 4.6 per cent of diagnosed thromboses and 8.1 per cent of diagnosed nonfatal embolisms. This difference is not statistically significant. In the majority of nonfatal embolisms no evidence of thrombosis was found. The majority of fatal embolisms were unexpected. Thrombosis diagnosed in life is commoner on the left side than the right. This is the reverse of the observations in a large postmortem series of fatal embolisms.

Iron and Hemoglobin During Pregnancy.—Widdowson studied the hemoglobin levels of pregnant women before, during and after periods of therapeutic medication with iron. Hemoglobin determinations were made by the Haldane method of 100 women, all of whom were twenty weeks' pregnant or less, attending the antepartum department of King's College Hospital, London. The determinations were repeated a month later. Then half the women (those attending on Wednesdays) were prescribed 1,000 mg. of iron, as ferric ammonium citrate or ferrum reductum, daily for six weeks. The level of hemoglobin

in the capillary blood was determined at fortnightly intervals. The administration of iron was then stopped and the hemoglobin estimated fortnightly until a week after delivery. The other women (attending on Tuesdays) were given no medicine, and their hemoglobin levels were observed at monthly intervals until delivery and again a week later. In both groups an estimation was always made within twenty-four hours after delivery. At the end of the experiment it was decided not to consider (1) women whose babies were born before the thirty-sixth week, (2) women who had taken the last dose of iron within eight weeks of delivery and (3) women in the experimental group who had not taken the prescribed iron. After these omissions thirty-one women were left in the "iron" group and forty-four in the control group. In the control series the characteristic response was a tendency to fall steadily throughout pregnancy and to rise sharply after delivery. The cause of the fall, although possibly in some cases the result of a true deficiency of iron, is probably due largely to a rise in the volume of plasma unaccompanied by a corresponding rise in the number of circulating red blood cells. The responses of the experimental group are much more complicated than those of the control because, besides the effects of pregnancy and delivery common to the two groups, two further stimuli were in operation: (1) the administration of iron and (2) the cessation of its administration. The response to iron was not an instantaneous increase in all the women's hemoglobin concentrations. A few of the hemoglobin curves continued to fall, as though iron had not been given at all; several showed a break in the fall but no real rise, and some of them rose. The cessation of administration of iron led almost always to a fall in the hemoglobin level of those women in whom its administration had initiated a rise. In the discussion the author points out that, whereas the administration of iron has been shown by others to check the fall of hemoglobin during pregnancy, the fall after the administration has been stopped is a new observation and one which is difficult to explain. The tentative explanation offered by him is that one of the many factors regulating the level of hemoglobin in the circulation is the amount of iron in the plasma; the more there is, the more active the marrow cells become. When iron is not being administered, the amount of iron in the plasma is maintained at a low constant level by the high capacity of the storage organs. The administration of iron, however, temporarily raises the plasma iron, which stimulates the marrow to greater activity. It will be noted that this theory emphasizes the amount of iron in the plasma rather than the amount in the body as the regulator of marrow activity. The problem arises: Does the raising of a person's hemoglobin with massive doses of iron prove that the person was in need of iron; i. e., in a pathologic state? It might reasonably be held that, if the hemoglobin fell to its original level when the iron was discontinued, no pathologic state had been disclosed. Against this view must be set the weight of clinical opinion, which has pronounced definitely in favor of raising the hemoglobins of babies and pregnant women.

Medical Journal of Australia, Sydney

2: 303-344 (Aug. 26) 1939

- Pott's Disease in Children. G. K. Smith.—p. 303.
Tumors and Malformations of Blood Vessels of Brain and Spinal Cord. L. B. Cox and H. C. Trumble.—p. 308.

Proceedings of Royal Society of Medicine, London

32: 1191-1370 (Aug.) 1939

- Town and Country Planning. G. L. Pepler.—p. 1191.
*Familial Hepatitis. F. B. Parsons.—p. 1197.
Diagnostic Value of Hystero-graphy. A. Davis.—p. 1211.
Factors Influencing Attitude of Fetus in Utero. G. F. Gibberd.—p. 1223.
Effects of Stilbestrol on Labor. J. H. Peel.—p. 1230.
Plasma Phosphatase in Jaundice in Children. W. W. Payne.—p. 1265.
Porphyrins and Their Relation to Metabolism of Blood Pigments. C. Rimington.—p. 1268.
Porphyrin Excretion Following Antipyretics. G. Brownlee.—p. 1276.
*Methemalbumin in Man (Pseudomethemoglobin). N. H. Fairley.—p. 1278.

Familial Hepatitis.—Parsons reports familial hepatitis in a family of nine children. Two of the children are alive and well, two are alive and have hepatic enlargement, four have died from hepatic failure and one has died probably of some other cause. No member of the family suffered from icterus neonatorum and in no case has there been any suggestion of retardation of growth. Both parents are alive and well. They

have not suffered from relevant illnesses in the past and, so far as can be ascertained, there is no history of hepatic dysfunction on either side. Although necropsies were done on only two members of this family, the appearances observed are common to those of patients dying of cholemia. The picture in one case was that of a perlobular cirrhosis and in the other of a multilobular cirrhosis, but in each case it appeared that an acute hepatic necrosis was superimposed on a chronic hepatitis. No satisfactory evidence was obtained of the ingestion of any substance known to provoke hepatic damage. The incidence of the cases occurring over a period of twenty-two years is against this view. The occurrence of choreiform movements for fourteen months before death in one case and the fact that the disease manifested itself in the second decade of life indicates that the possible diagnosis of hepatolenticular degeneration cannot lightly be dismissed, particularly as the changes in the brain in this condition are not always visible to the naked eye on postmortem examination and that they are sometimes elusive on microscopic examination. The presence of cirrhosis of the perlobular type, the absence of significant changes in the brain and the occurrence of unilateral movements diagnosed as hysterical are, on the whole, not in harmony with a diagnosis of hepatolenticular degeneration, and it would seem that the family should be regarded as an example of familial hepatitis.

Methemalbumin in Man.—Methemalbumin in man, according to Fairley, is formed from extracorporeal hemoglobin when blood is destroyed in large quantities and remains in the circulation for a sufficient time. During the extracellular catabolism of hemoglobin, the molecule is split into globin and haem. The haem is oxidized to hematin, which promptly unites with serum albumin to form methemalbumin, the latter not passing through the kidney and never appearing in the urine. Recent work by Rimington indicates that hematin injected intravenously produces an increased porphyrin excretion in the feces. It appears that, like bilirubin, methemalbumin is disposed of by way of the liver and would be present in greater concentration in the circulation when intravascular hemolysis was associated with liver disease. This, the author states, he has recently confirmed clinically in cases of cirrhosis of the liver and splenomegaly associated with hemolytic anemia and hemoglobinuria.

Tubercle, London

20: 485-532 (Aug.) 1939

- *Sedimentation Rate, White Blood Cell Count and Temperature in Acute Lobar Pneumonia. I. Douglas-Wilson.—p. 485.
Radiologic Examination of Larynx. R. S. Stevenson.—p. 497.
Tuberculous Cervical Lymphadenitis: Epidemiology and Pathogenesis. B. C. Thompson.—p. 504.
Id.: Pathology and Treatment. E. S. Evans.—p. 510.

Sedimentation Rate, Leukocyte Count and Temperature in Pneumonia.—Douglas-Wilson determined the relation between the sedimentation rate, leukocyte count and temperature in forty-four cases of acute lobar pneumonia, in which there were ten deaths. Estimations were made daily throughout the febrile period and at regular intervals thereafter until recovery was complete. The mean sedimentation rate increased from the second (40) to the fourth day (81.38) of illness and then fluctuated around a constant level for the following three days with the maximal figure on the sixth day (82.91), before declining. In the case of the leukocyte count the mean figure fell from the first (187.1) to the sixth day (111.8), whereafter it rose till the ninth day (161.3). A slow decline ensued. Wide fluctuations above and below the average were found both in the sedimentation rate and in the leukocyte count. Body temperature had no influence on the sedimentation rate and leukocyte count. The only statistically significant correlation between the sedimentation rate and the leukocyte count occurred in the first four days of illness, but the trend of the signs of the coefficients suggests that, whereas at first they tend to be inversely related, the tendency in the later days is toward a direct relationship. This was confirmed by calculation of the correlation coefficient for each day by Sheppard's method. The change from inverse to direct variation occurred about the sixth day. In individual cases inverse variation was observed for a period varying with the duration of fever and occasionally persisted up to the tenth day of illness. The maximal, minimal and mean of the sedimentation rate in the fatal cases did not differ greatly from that in the cases in which survival occurred. A fatal outcome

invariably resulted with leukopenia but leukopenia was found in only a half of the fatal cases. In the other half a moderate and even increasing leukocytosis was found. In every fatal case the sedimentation rate began to decrease either two or three days before death, and this decrease continued up to the time of death. This progressive fall of the sedimentation rate, especially when accompanied by a high or rising pulse rate, has been found an excellent guide to the prognosis, resulting on several occasions in the accurate forecast of a fatal outcome which would have been otherwise unforeseen. In bronchopneumonia the same tendency as in lobar pneumonia toward inverse relationship of the sedimentation rate and leukocyte count in the febrile stage has been observed. The sedimentation rate remains increased longer during resolution in bronchopneumonia than in lobar pneumonia. As in lobar pneumonia, the sedimentation rate returned to normal only when resolution was complete.

Chinese Medical Journal, Peiping

56:1-98 (July) 1939

- *Hematuria, Renal Colic and Acetylsulfapyridine Stone Formation Associated with Sulfapyridine Therapy. I. Snapper, S. H. Liu, H. L. Chung, T. F. Yu and H. M. Sun.—p. 1.
Research on Typhus in Shanghai. J. H. Raynal, J. Fournier and E. Velliot.—p. 11.
- *Further Studies on Serum Treatment of Typhoid Fever. H. Yu.—p. 29.
Development of Leishmania in Chinese Sandflies Fed on Dogs with Canine Leishmaniasis. L. C. Feng and H. L. Chung.—p. 35.
Natural Infection of Phlebotomus Chinensis in Peiping with Leishmania Flagellates. H. L. Chung and L. C. Feng.—p. 47.
Mosquitoes of Hunan Province, with Special Reference to Anopheles. T. L. Chang.—p. 52.
Plan for Malaria Control in Yunnan. H. Y. Yao.—p. 63.
Tuberculosis in a General Hospital. T. C. Y. Sun and J. C. Thoroughman.—p. 69.

Hematuria, Colic and Calculi After Sulfapyridine Therapy.—Snapper and his associates report the occurrence of hematuria during sulfapyridine treatment both in children and in adults. Of the three adults, the first had asymptomatic hematuria, the second hematuria and colicky pain, and the third hematuria associated with a renal calculus composed of acetylsulfapyridine. Several cases of hematuria in children have been encountered by the authors. They report one in which hematuria developed after thirty-six hours of medication. They believe that the recovery of a sulfapyridine calculus from the urinary tract in man has not as yet been recorded. According to recent experiments on rats, rabbits and monkeys, after continuous therapy with sulfapyridine the urine often shows small concretions consisting of needle-like crystals. These crystals prove to be acetylsulfapyridine. The same process appears to occur in patients treated with the drug. The highly insoluble acetylsulfapyridine which is formed during the metabolism of the drug precipitates in the urinary tracts, giving rise to crops of crystals and eventually to little calculi. Irritation or traumatism by the calculi would result in hematuria with or without renal colic. It is evident that in some cases, as observed by Southworth and Cooke, obstruction of the ureter by these concretions may lead to temporary anuria and nitrogen retention in the blood. Different animal species vary in their susceptibility to urolithiasis as a result of sulfapyridine administration. Whereas monkeys needed 0.25 Gm., rabbits from 10 to 15 Gm. and rats 5 Gm. per kilogram of weight daily for ten days, acetylsulfapyridine calculi developed in one of the patients after he received approximately 0.1 Gm. of sulfapyridine per kilogram daily for nine days.

Serum Treatment of Typhoid.—Yu treated sixty-four cases of typhoid with serum prepared with alcohol killed and live antigens. In thirty-three cases there was an immediate drop in temperature and a decrease in toxic symptoms. In nineteen there was a reduction in toxemia but no noticeable effect on the temperature curve. There was no change in the remaining twelve patients. The study substantiates the previous reports from the Lester Institute and the reports of Felix and other workers that the new antityphoid serum is definitely beneficial. The beneficial effect of this batch of serum on toxemia was more striking and constant than the effect on pyrexia. To date, a total of 305 cases of typhoid have been treated with this new serum. Although the number is still small, the good results obtained in the hands of the various workers justifies its routine employment in typhoid, more especially if toxemic features are in evidence.

Archives des Maladies de l'Appareil Digestif, Paris

29: 697-816 (July) 1939

- Complicated Diverticulum of Duodenum. R. Gregoire.—p. 701.
- *Primary and Secondary Hypotension and Metabolism of Carbohydrates. H. G. D. Fisel.—p. 710.
- *Lipothymia in Chronic and Latent Appendicitis. A. C. Borcesco and V. Ionescu-Movila.—p. 750.

Hypotension and Carbohydrate Metabolism.—Fisel says that it was Ferrarini who first directed attention to a morbid entity which he designated as constitutional angiohypotonia and which is characterized by arterial hypotension resulting from deficient tonus in the vascular system and in other tissues. Fisel says that this form of hypotension is characterized by a more or less pronounced physical and psychic fatigue. Slight exertions exhaust these patients. Moreover, they have frequent painful sensations in the cardiac region such as retrosternal constriction, palpitations, sensations of emptiness, feelings of anxiety, and pains radiating toward the left arm. Hypoglycemic crises are known to occur in these cases. The sensations of hunger are suppressed by a small amount of nourishment, especially carbohydrates. Postprandial somnolence is a frequent symptom in these cases and general malaise, vertigo, headaches, dimness of vision, fainting, abnormal sensitiveness to cold on the part of the extremities, acrocyanosis, paresthesias, constipation and painful menstruation are other symptoms often observed. Since the clinical symptoms of hypotonia resemble those of hypoglycemic shock, Fisel decided to investigate the carbohydrate metabolism of patients with hypotonia by means of sugar tolerance tests. His studies were made on patients with primary hypotonia and on some with secondary hypotonia, forty in all. He designates as secondary that form of hypotonia which is encountered in the course of or after grave diseases such as acute infectious diseases, intoxications and cardiovascular diseases. After describing the characteristics of the blood sugar curves which he obtained in the two forms of hypotonia, he says that the clinical aspects and the studies on the carbohydrate metabolism lead him to conclude that primary hypotonia is the manifestation of an absolute displacement of the neurohormonal factors; that is to say, there exists an augmentation of the tonus of the vagal system and hyperfunctioning of the endocrine glands belonging to the insulin group. Secondary hypotonia is the manifestation of a relative displacement of the hormonal factors, that is, of hypotonicity of the sympathetic nervous system and of hypofunction of the endocrine glands of the adrenal group, or it is the expression of hepatic disturbances or of both hepatic and endocrine perturbations.

Lipothymia in Chronic and Latent Appendicitis.—Borcesco and Ionescu-Movila think that many cases of chronic appendicitis are not recognized because either they do not present symptoms permitting a definite diagnosis or the physician does not think of this disorder. In the course of a long practice, a careful search for symptoms indicative of chronic or latent appendicitis revealed to the authors three which they consider of great value. These are (1) appendicular vertigo, (2) lipothymia (faintness) and (3) urgent diarrheal stools preceded by colics which cease after evacuation. These three symptoms when associated in one case constitute a veritable symptomatic triad valuable for the diagnosis of chronic and especially of latent appendicitis. In this report the authors direct attention especially to the second of the triad of symptoms; namely, to lipothymia or faintness. After giving brief outlines of twenty typical examples of faintness in cases of appendicular lesions, they stress the following points: 1. Lipothymia is a symptom which is of great value for the diagnosis of chronic and latent appendicitis. Studies in 3,000 cases of appendicular lesions revealed it in 244, that is, in 8 per cent. 2. Lipothymia is sometimes associated with vertigo and with urgent diarrheal stools that are preceded by colics which disappear after evacuation. 3. Lipothymia can be considered as a symptom coming on unexpectedly with recurrences of chronic appendicitis, often announcing an appendicular crisis or as the first symptom of the onset of appendicitis. 4. It is important that the physician know the appendicular origin of lipothymia, so that in a case which, apart from other digestive disturbances, presents lipothymia, the possibility of a chronic appendicitis will be taken into consideration.

Journal Belge de Neurol. et de Psychiat., Brussels

39: 607-646 (Sept.) 1939

- *Azoman (Triazol) in Therapy of Schizophrenia. H. Hoven.—p. 607.
Korsakoff's Psychosis with Polyneuritis in Course of Postpuerperal Septicemia. M. Maere.—p. 616.
Pneumococcal Meningitis Cured by Sulfanilamide. E. Evrard and A. Bragard.—p. 622.

Therapy of Schizophrenia.—Discussing the various types of shock therapy of schizophrenia, Hoven says that insulin exerts a favorable effect especially on the paranoid, hallucinatory type of dementia praecox and on catatonic dementia praecox with agitation, whereas metrazol is most effective in stuporous dementia praecox and in late schizophrenia. However, treatment with metrazol presents certain inconveniences. It frightens some patients because it causes anguish and the feeling that death is imminent and so the patients refuse to submit to injection. Attempts have therefore been made to substitute other preparations which do not have the shortcomings of metrazol. In this paper the author discusses the use of azoman, which is known also as triazol and the chemical composition of which greatly resembles that of metrazol. After citing other investigators who have employed this substance, the author says that so far he has used it in twenty-five cases of schizophrenia and that he can confirm the favorable results obtained by others. He says that the substance is available in a 5 per cent aqueous solution and that it can be administered by intravenous or intramuscular injection. In general remarks about the dosage he cites studies by von Braunmühl in which it was determined that for intramuscular injection the dose should be 0.039 cc. of the 5 per cent aqueous solution per kilogram of body weight for men and 0.037 cc. for women; for the intravenous injection the corresponding doses are 0.023 and 0.021 cc. respectively. If a patient is in a hypoglycemic (postinsulin) state the doses are slightly different. The computation of the dose to be injected is not as complicated as it might appear; for instance, to a patient weighing 56 Kg., 1.2 cc. of the solution was administered by intravenous injection and to a patient weighing 59 Kg., 2.2 cc. was given by intramuscular injection. The authors report several cases in which they employed the substitute of metrazol. They reach the conclusion that, if utilized with caution, the new preparation has great advantages and produces good results in schizophrenia.

Presse Médicale, Paris

47: 1285-1300 (Aug. 26) 1939

- *Therapeutic Value of Autonomous Pleurotomy. F. Dumarest and P. Pavie.—p. 1285.
Hematoporphyrin Therapy in Pyramidal Hypertonia. W. Sterling and W. Stein.—p. 1287.

Pleurotomy in Artificial Pneumothorax.—Dumarest and Pavie evaluate the advantages of pleurotomy in pleural complications of artificial pneumothorax. In their analysis of the threefold objection to this surgical procedure, namely the dangers of secondary infections, the risks to the organism of prolonged suppuration and the irremediability of thoracic fistulas when once established, they present the following considerations: 1. Pleural infections occur almost entirely in exceptional cases, such as when surgical intervention is performed on cachectic patients as a last desperate measure or when poor drainage causes retention of infective matter. A correctly performed and maintained drainage eliminates, in principle and practice, all infectious evolution. 2. Clinical observations show that pleurotomy is no hindrance to a gradual establishment of excellent well being with a rapid gain in weight and that it does not lead to amylosis. The inconveniences of prolonged suppuration diminish in time. 3. The spontaneous occlusion of fistulas is of frequent occurrence when drainage has not exceeded several months. In thirty-nine recent pleurotomies the authors, jointly with Rougy, their deceased collaborator, could report closing of parietal fistula in eight cases, five with symphysis and three with conservation of the pneumothorax. In their discussion of the advantages of pleurotomy, the authors point out that its pulmonary significance apart from any pleural value lies in the fact that rarely homolateral or contralateral pulmonary evolutions are found in cases in which an effective pleurotomy has been performed. According to the authors, pleurotomy offers the following pulmonary advantages: (1) It protects the oppo-

site lung from infection in the event of perforated pneumothorax and has surprising curative effects on existing contralateral lesions; (2) it completes the collapse of the lung under treatment; (3) it facilitates the occlusion and cicatrization of pleuropulmonary fistulas in intermittent and latent cases in which surgery is performed without delay. Wide, open fistulas, however, persist but are easily endured by the patient if drainage is properly continued. The clinical experiences of the authors, therefore, do not confirm alleged dangers to the pleura and lungs. On the contrary, surgical delay and prolonged pleural lavage may convert an intermittent into a permanent fistula and induce fatal consequences of pulmonary inundation. Nor are tuberculous pleurisies of malignant evolution benefited by puncture and lavage, rapidly becoming cachectic. Open pleural cavities in cases of complete pneumothorax in which infection is maintained by a permanent pleuropulmonary fistula can be stabilized effectively for a long time by pleurotomy. The advantage of pleurotomy over thoracoplasty in pleural infection rests on avoiding the necessity of an early severe operation with its high fatality when the patient is in a precarious condition and in restoring him progressively to the resumption of at least a partial customary activity of life. The inconveniences of permanent drainage receive their proper evaluation in the scale of relative human values in the sentiment expressed by one of the author's patients that it is better to live in ill health than to die while being cured.

Revista Médica Latino-Americana, Buenos Aires

24: 983-1085 (July) 1939. Partial Index

- Medical Treatment of Phlegmons of Dental Origin by Necarsphenamin. J. Beltrarena S.—p. 983.
Determination of Bilirubinuria. L. Galindez and E. Vanni.—p. 994.
*Mammography: X-Ray Examination of Milk Ducts by Using Contrast Mediums. A. E. Nogués and C. L. Gazzotti.—p. 999.

X-Ray Examination of Milk Ducts.—Nogués and Gazzotti made an x-ray study of the milk ducts (so-called mammography) of a group of nine women. They resorted to Hicken's technic, which was reported in *Surgery, Gynecology and Obstetrics* in March 1937 and abstracted in *THE JOURNAL* May 1, 1937, page 1575. The procedure utilizes a contrast substance, which is injected into the milk ducts for x-ray study. The authors used a 30 per cent solution of thorium dioxide sol. They describe in detail and also by illustrations the x-ray aspects of the milk ducts in normal conditions, during lactation and in the presence of mammary or intracanalicular tumors, as well as in the presence of the bloody, white and yellow discharge from the nipple. The authors found that the procedure is harmless if it is carried on by the proper technic. The method has proper indications, namely (1) the diagnosis of intracanalicular tumors or of inflammation of the milk ducts, (2) diagnosis of the intracanalicular tumoral (or nontumoral) origin of the bleeding nipple and (3) the differential diagnosis of various types of white and yellow discharge from the nipple. The authors found that milk ducts which harbor a tumor (papilloma or carcinoma) give mammograms with shadows showing ampullar dilatation and a lacunar image. The nature, either benign or malignant, of the tumor cannot be diagnosed from the aspect of the mammogram. Clinically intracanalicular papilloma shows by the bleeding nipple. Therefore the x-ray appearance of the bleeding nipple from intracanalicular papilloma is that of milk ducts harboring a tumor. Mammograms of breasts with a white or yellow discharge which is due to any of the various types of acute and chronic inflammation of one or several milk ducts, with or without complicating canalicular abscess, are those which correspond to the given type of inflammation and to the evolution of the conditions. The x-ray aspects in the conditions are varied. Generally the mammograms give shadows showing more or less intense ampullar dilatation of the involved ducts or else pseudocavities, retraction and anfractuosités. The mammograms can be differentiated from those of breasts with secretion from the nipple which is due to mammary tumors without involvement of the canalicular system, which shows normal at the mammogram. In the diagnosis of paraductal tumors without involvement of the ductal system, mammography has a secondary value. The seat, form and number of the tumors can be interpreted from the deformation of the ducts from the neighboring tumors. Cancer of the breast can be suspected by

a mammogram which shows deformation of the milk ducts and destruction of the ductal branches as they touch the tumor, which is shown by a dark shadow which absorbs the ductal branches as though the latter were amputated by the former.

Klinische Wochenschrift, Berlin

18: 981-1012 (July 22) 1939. Partial Index

- Experimental Investigations on Iodophilia of Leukocytes. F. Hoff and L. Bachmann.—p. 981.
New Objective Criterion for Detection of C-Hypovitaminosis. P. Wördehoff.—p. 984.
Parenteral Dextrose Tolerance Test. F. Axmacher and E. Funke.—p. 984.
*Development of Free Gases in Blood and Tissues in Rapid Decompression. G. Schubert and A. Gruner.—p. 988.
Behavior of Iron Content of Serum During Influenza. P. Büchmann and E. Heyl.—p. 990.
Limits of Metabolic Action in Dentin. T. Spreter von Kreudenstein.—p. 992.

Free Gases in Rapid Decompression.—Schubert and Gruner studied the question of the development of gases in blood and tissues during sudden transition from extremely low to normal atmospheric pressures and aimed to determine whether the danger of gas embolism can be averted by prompt return to normal pressure. A solution of these questions seemed important in connection with flying in the stratosphere. Experiments on rats which were subjected to low atmospheric pressures (70 mm. of mercury) and then were returned to normal pressure gave information about the pathogenesis of atelectasis. The development of gases and gas embolism were likewise investigated on rats as well as on other species of animals (guinea pigs, cats and dogs). The authors show that their experiments give information about the dangers threatening persons who fly at stratospheric altitudes, when the chamber or the pressure suits suddenly become defective. They found that even a brief transition (less than one minute) to pressures between 75 and 70 mm. of mercury, that is, to altitudes of from 16,000 to 17,000 meters, is not necessarily fatal if a return to greater pressures is effected immediately. However, the longer the aviators stay at this pressure, the more extensive are the tears in the pulmonary tissues and the hemorrhages into the alveoli and bronchioles. These represent the life threatening factor, even if the return to normal pressure lasts only seconds, whereas the development of gases represents an entirely reversible process. A stay of more than ninety seconds in pressures of less than 60 mm. of mercury is absolutely fatal, for a return to normal pressure, even for seconds, produces not only a complete atelectasis of the lung but also the development of such quantities of gases that the circulation in the vital organs is at once impaired and remains so permanently. The authors show that there are physiologic and technical protective measures against these dangers. The most effective physiologic one is that as soon as the chamber or the pressure suit become defective a voluntary hyperventilation is begun in order to effect equilibration of pressure between lung and external air and thus avoid tearing of the pulmonary parenchyma and also to reduce the tension differences of gases by increased diffusion. The technical protective measure consists in provision with tanks containing highly compressed oxygen. They should be discharged under high pressure to be regulated automatically by the pressure of the chamber. The same automatic regulation should be provided during steep descent.

Monatsschrift für Kinderheilkunde, Berlin

79: 1-146 (July 6) 1939. Partial Index

- Indication for Treatment in Climatic Chamber. S. Liebe.—p. 1.
Supester Infection During Childhood. W. Goeters.—p. 27.
Hepatic Rickets. M. Klotz.—p. 39.
Parenteral Administration of Antirachitic Vitamin. M. Klotz.—p. 43.
Dermographic Manifestations During Childhood. Ruth Husgen.—p. 52.
Blood Forming Action of Soy Flour. T. Takuma and K. Sakurai.—p. 62.
*Pathogenesis of Renal Hemorrhages During Diphtheria. H. Stiepel.—p. 67.
Protein Metabolism of Nurslings in Light of Nitrogen and Sulfur Metabolism. P. Ujsághy.—p. 79.

Pathogenesis of Renal Hemorrhages During Diphtheria.—Stiepel points out that hematuria is occasionally observed in cases of diphtheria. Reviewing different opinions about the source of these hemorrhages, he says that Randerath demonstrated in 1933 that renal hemorrhages in diphtheria represent glomerular hemorrhages brought about by capillary

impairment and that the appearance of erythrocytes in the urine of diphtheria patients does not permit the conclusion that a glomerular nephritis exists. On the basis of his microscopic studies, Randerath could exclude not only glomerular nephritis but also glomerular irritation and glomerular hemorrhages as the result of stasis, and he interpreted the hemorrhages as the manifestations of impairment of the glomerular capillary walls. He thinks that these hemorrhages can be regarded as equivalent to the cutaneous and to the subserous and subendocardial hemorrhages of diphtheria patients. Since Randerath's conclusions were based on a single observation, Stiepel decided to reexamine his results in a larger number of cases. He made microscopic studies on the kidneys in fifteen fatal cases of diphtheria and, in addition to purely nephrotic changes in the region of the tubules, he observed in eight cases in circumscribed regions of the renal cortex massive hemorrhages into the glomerular capsules and into the lumens of the uriniferous tubules. The author agrees with Randerath that these hemorrhages originate in the glomerular coils and that they are the result of an impairment of the walls of these coils, which in turn is a manifestation of the generalized capillary impairment during diphtheria. The microscopic aspect of all eight cases demonstrate clearly that the presence of erythrocytes in the urine does not permit the conclusion that inflammatory processes exist in the kidney. Their appearance in the urine is only an indication of the severity of the existing capillary changes.

Vrachebnoe Delo, Kharkov

21: 291-370 (No. 5) 1939. Partial Index

- Hepatopulmonary System. S. M. Leites.—p. 291.
*Hepatopulmonary Syndrome in Lobar Pneumonia. A. L. Vilkovskiy.—p. 293.
Role of Lungs and of Liver in Carbohydrate Metabolism of Lobar Pneumonia. P. M. Perehik.—p. 299.
Alterations of Nitrogenous Component of Serum in Lobar Pneumonia. M. I. Dunayevskiy.—p. 307.
Course of Sedimentation Reaction of Erythrocytes in Lobar Pneumonia Treated by Intravenous Serum. A. G. Korfanti.—p. 313.
Venous Pressure in Pneumonia of Children. L. B. Krasik.—p. 315.

Hepatopulmonary Syndrome in Lobar Pneumonia.—Vilkovskiy sensitized rabbits by intravenous injection of horse serum or of a dead culture of pneumococci or streptococci, after which the horse serum was administered either by inhalation or by the intratracheal route, or by the combination of the latter with simultaneous injection of pneumococci into the blood stream. The effect of cooling, analogous to "catching a cold," was likewise estimated. These experiments, carried out on eighty animals, demonstrated the role of the allergic factor in the genesis of lobar pneumonia, the possibility of producing sensitization by various agents, such as heterogeneous proteins, nonspecific or specific micro-organisms, the possibility of producing pneumonia through hematogenous introduction of the infectious agent, the relatively greater importance of the pneumococcus as the determining factor, and the role of cooling, which increases the hyperergic reactions but is of little influence outside the conditions of sensitization. The author points out an analogy between some of the metabolic functions of the liver and the lungs, such as the removal of excess lactic acid, and the nitrogenous and the chloride metabolism. In order to study the carbohydrate metabolism in experimental pneumonia, the author first determined the glycogen content of the liver, the muscles and the lungs of five control rabbits. A similar study was made of fifteen rabbits in which experimental pneumonia was induced by sensitization with intravenous injection of horse serum, followed by intravenous injection of a culture of pneumococcus, and by intratracheal introduction of horse serum. There was noted a lowering of the glycogen content of the liver to almost one tenth of the normal, while the muscle glycogen content showed slight increase, whereas the glycogen of the altered pulmonary tissue exceeded that of the control animals by 167 per cent. These experiments demonstrated marked alteration of liver function at the height of the hyperergic inflammation of the lungs. Tissue metabolism of the liver, of the unaffected lung and of the affected lung of nineteen rabbits was studied. There was noted a marked lowering of tissue respiration in the liver and a slight increase in glycolysis. In the pathologically altered lung there was a fall in tissue respiration and an increase in glycolysis. A diminution of respiration was likewise noted in the normal lung, a fact having a bearing on the anoxemia of pneumonia patients. Of the pneumonia patients

observed by the author, 22 per cent had an enlarged and tender liver. Many of these had urobilinuria. On the theory that the detoxication function of the liver depends on its glycogen content, the author applied insulin-dextrose therapy, first suggested by Kogan-Yasnny in cases of lobar pneumonia. In a group of seventy-four patients with pneumonia treated by the insulin dextrose therapy, the mortality rate amounted to 5.4 per cent, while in a group of 131 patients treated during the same period on an orthodox regimen, the mortality amounted to 15.2 per cent. The author believes that the beneficial influence of the insulin-dextrose therapy is due to the improvement in the glycogen synthesis with the resulting increase in glycogen storage in the liver, which in turn increases the antitoxic function of the liver. The increased glycogen content also may exert a favorable effect on the allergic reactions.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

31: 3873-3980 (Aug. 5) 1939. Partial Index

- Foreign Bodies in Esophagus. C. E. Benjamins.—p. 3874.
 *Progestin in Repeated Abortion. M. H. G. A. Tholen and L. A. M. Stolte.—p. 3880.
 Fractures of Jaw. B. van Ommen.—p. 3888.
 Blood Picture in Metastatic Tumors of Bone Marrow and in So-Called Leukemia. F. S. P. van Buchem and D. J. J. M. Hendriksen.—p. 3893.
 Encapsulated Pericardial Exudate. J. H. Nauta.—p. 3904.

Progestin in Repeated Abortion.—Tholen and Stolte first review the present status of the knowledge about progesterone, the hormone of the corpus luteum, giving especial attention to its role in the preservation of pregnancy. They cite factors which indicate that a deficiency of corpus luteum hormone plays a part in habitual abortions and that the injection of this substance is a valuable aid in counteracting habitual abortion. Further they review the clinical histories of nine women in whom pregnancy usually terminated in abortion, twenty-nine pregnancies producing only two living children. After treatment of these women with progesterone was instituted, twelve pregnancies resulted in eight living births; to be sure, the authors admit that these probably cannot all be ascribed to the action of progesterone. Nevertheless, they are convinced that progesterone represents a valuable addition to the therapeutic armamentarium of habitual abortion. They think that larger doses than were employed by them might perhaps produce better results. The small doses employed at present and the defective differential diagnosis still necessitate a combination with other therapeutics such as a salt-free diet, thyroid and vitamin E.

Acta Chirurgica Scandinavica, Stockholm

82: 549-628 (Aug. 5) 1939

- *Pneumococcic Peritonitis in Children. O. Haglind.—p. 549.
 Congenital Bilateral Hydro-Ureter in Man Aged 22. C.-H. Hirschlaff-Hjortsjö.—p. 587.
 *Pericardectomy in Fibrous Pericarditis: Two Cases. K. H. Köster.—p. 595.
 Acute Porphyria Without Porphyrinuria. E. Schie.—p. 618.

Pneumococcic Peritonitis in Children.—Haglind says that genuine or cryptogenic pneumococcic peritonitis, in which the peritoneal fluid contains only pneumococci and in which neither operation nor necropsy discloses a local point of origin, has received considerable attention in different countries and so he decided to review the cases that were treated in Swedish hospitals during recent years. All of the seventy-seven patients who were the subject of his review were children less than 16 years of age. In all of the cases the diagnosis was bacteriologically verified. The majority of the patients (92 per cent) were girls and most of them were between 6 and 10 years old. The pneumococcic peritonitis seems to be a primary process in the majority of cases, for in only a small number did it appear as a secondary phenomenon to other forms of pneumococcic disorders. As regards the symptomatology, it is of especial interest that the anamnesis frequently reveals diarrheas, that the fever is high from the beginning and that the general condition is poor from the onset. The mortality of pneumococcic peritonitis is high, in the material reviewed here 66 per cent. The differential diagnosis is difficult and efforts have been made to find methods which will permit a definite diagnosis before an operation is resorted to, because a surgical operation during the acute stage of this form of peritonitis seems to increase the risk of death rather than reduce it. The author shows that explora-

tory puncture has been recommended by some as a diagnostic aid. In remarks about the pathogenesis he cites the various possible routes by which pneumococci might invade the peritoneum. In view of the fact that the majority of patients are girls, he considers a genital mode of infection possible; on the other hand, he shows that there is considerable evidence for an enterogenic infection. He says that in the treatment of pneumococcic peritonitis a conservative tendency has been gaining during recent years, although the debate about surgical or conservative treatment is still not definitely decided. The fact that pneumococcus type I seems to be the cause of the peritonitis in more than two thirds of the cases is of great interest for a possible serotherapy. The author further suggests that in view of the favorable results obtained with sulfapyridine in pneumonia it might be advisable to try this preparation also in pneumococcic peritonitis.

Pericardectomy in Fibrous Pericarditis.—After reviewing the literature on surgically treated cases of fibrous pericarditis and following remarks about the pathogenesis and diagnosis, Köster reports two cases in which the classic symptoms of fibrous pericarditis were present: increased venous pressure with protruding veins, coughing, ascites, enlarged liver, edemas, reduced beat volume with lowered blood pressure, small pulse, cyanosis, oliguria, exertion dyspnea, tachycardia and fatigue. Before, during and after pericardectomy the oscillations of the pulse volume were registered by means of Liljestrand-Zander's method, in which 0.7 mg. of epinephrine is injected previous to the registration of the pulse and the beat volume. This method yielded results similar to those obtained by other investigators with Grollmann's method. In the surgical treatment of the two patients, pericardectomy was preferred to Brauer's operation in spite of the fact that many regard the latter as adequate and less dangerous. In the first case, although the symptoms had existed a long time, the fibrous pericardium could be detached fairly readily and extensively and the patient's condition was much improved after the intervention; she is able to work. In the other case the condition developed rapidly after an attack of acute pericarditis; technically the operation was extremely difficult and only a small portion of the pericardium was resected. However, in spite of the less radical intervention, this patient made a more rapid and better recovery than did the first one. Following remarks about the problem of drainage in pericardectomy, the author says that after the operation the patients were treated with digitalis and morphine. He thinks that the postoperative prognosis seems to depend not so much on the size of the resected piece of pericardium as on what damage the heart has sustained under the influence of inactivity and compression and to what extent the disorder which caused the pericarditis (usually tuberculosis or rheumatic infection) has subsided. Operation during the acute stage is technically easier, but it involves greater dangers for the patient, and for this reason some authors advise against pericardectomy during the acute stage.

Nordisk Medicin, Helsingfors

3: 2133-2216 (July 15) 1939. Partial Index

Hospitalstidende

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Magnesium Content of Red Cells in Anemias.—Bang and Ørskov state that an increased magnesium content of the erythrocytes seems frequently to follow in anemias originated because of relatively acute loss of blood and is further demonstrated in some anemias of long standing. In anemias due to hemorrhage as well as in experimental animals (Ørskov and Henriques) an increased magnesium content is believed to be a phenomenon connected with newly formed red blood corpuscles. In the majority of cases of pernicious anemia high magnesium values are present in the untreated stage and the relations approach normal values during remission. The view is thus supported that a short lifetime of red cells with concomitant increased rate of destruction is a decisive factor in the development of pernicious anemia.

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AFTER-EFFECTS OF HEAD INJURY

THE POST-TRAUMATIC CONCUSSION STATE (CONCUSSION, TRAUMATIC ENCEPHALOPATHY) AND THE POST-TRAUMATIC PSYCHONEUROTIC STATE (PSYCHONEUROSIS, HYSTERIA): A STUDY IN DIFFERENTIAL DIAGNOSIS

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Head injuries from warfare and from industrial and automobile accidents have in recent years occasioned a constantly increasing number of claims for awards, based on veterans' and industrial compensation laws and on public liability. The economic importance of a proper understanding of the physical and mental results of such injuries, from the standpoint of both occupational disability and future outlook for recovery, therefore is of great importance. Head injuries may be classified as organic or functional, dependent on the presence or absence of structural changes in nervous tissue. In the first category, that of organic injuries, are placed brain pressure by depressed skull fracture, epidural or subdural hemorrhage, lacerations, contusions, softening and complicating infections such as meningitis or abscess. The symptoms and signs of these more evident injuries have been carefully studied and classified as to demonstrated pathologic features, the treatment has been standardized and the prognosis has been fairly well evaluated, so they will not be dealt with in this paper. In the second category, that of functional disorders, are placed the post-traumatic psychoneuroses or traumatic hysterias, purely psychogenic states which develop out of mental complexes following the acute symptoms. Traumatic psychosis will not be considered here. Midway between these two contrasting pictures is the post-traumatic concussion state, an after-effect of injury variously designated as traumatic encephalopathy, traumatic encephalitis, cerebral neurasthenia, post-traumatic head syndrome, traumatic constitution, punch drunk, or concussion neurosis. I shall hereafter use the term post-traumatic concussion state, or simply concussion, to designate this group. I propose to define the term and describe the condition, particularly in differential diagnosis from the functional state. The term concussion, therefore, is employed to distinguish it from brain bruising or contusion; in an uncomplicated picture it indicates no gross primary brain injury. It is caused by a different traumatic mechanism than contusion and produces a temporary abeyance of brain

function; severe concussion, however, may result in irreversible brain changes. Only the later effects of brain injury are here considered, namely, those of patients who have recovered from all acute symptoms and have entered on a more or less chronic course.

THE POST-TRAUMATIC CONCUSSION STATE (CONCUSSION, TRAUMATIC ENCEPHALOPATHY)

Characteristic of brain concussion is a disturbance of consciousness, with no immediate or obvious pathologic change in the brain. It may or may not be followed by brain edema and increased intracranial pressure, depending on the severity of the injury. The early definition of Koch and Filehne¹ well describes the clinical picture.

Concussion is a state of more or less disturbed consciousness with lost or practically lost reflexivity. The appearance is that of sleep or apparent death, there is occasional vomiting. The respiration is slow, shallow and regular, the pulse is weak, slow and generally regular, the pupils are dilated and react sluggishly, the temperature is subnormal.

Physicians do not know the neural mechanisms which produce unconsciousness or, indeed, the anatomic seat of consciousness. Concussion is a reversible and recoverable phenomena in the great majority of cases; however, in severe concussion states, both of the human being and of the experimental animal, definite pathologic changes have long been recognized and described as affecting the myelin (Schmaus² in experiments on spinal cords), the ganglion cells (Jakob³) and the blood vessels (Kocher⁴). In the past, much experimental research has been done on the nature of concussion; this was thoroughly reviewed up to the past few decades by Kocher.⁵ A few of the most important of the experiments may be briefly mentioned: Duret⁶ produced concussion in dogs by the sudden and forceful injection of fluid into the cranial cavity, and Koch and Filehne¹ by hammering on a board applied to the cranium. The latter authors studied the effects on brain centers and concluded that the intracerebral effects were general; all centers—respiratory, vasomotor, vagus, and pupillary—were affected and in the end became exhausted, so that function was impaired.

1. Koch, W., and Filehne, W.: Beiträge zur experimentellen Chirurgie: 3. Ueber die Commotio cerebri, Arch. f. klin. Chir. 17: 190-231, 1874.

2. Schmaus, Hans: Beiträge zur pathologischen Anatomie der Rückenmarkerschütterung, Virchows Arch. f. path. Anat. 122: 470, 1890.

3. Jakob, Alfons: Experimentelle Untersuchungen über die traumatischen Schädigungen des Zentralnervensystems (mit besonderer Berücksichtigung der Commotio cerebri und Komotioneurese), in Nissl, Franz, and Alzheimer, Alois: Histologische und Histopathologische Arbeiten über die Grosshirnrinde, mit besonderer Berücksichtigung der pathologischen Anatomie der Geisteskrankheiten, Jena, Gustav Fischer, 1913, vol. 5, p. 182.

4. Kocher, Theodor: Zur Lehre der Gehirnverletzungen durch Stumpfe Gewalt, Deutsche Ztschr. f. Chir. 35: 433, 1892-1893.

5. Kocher, Theodor: Hirnerschütterung, Hirndruck und chirurgische Eingriffe bei Hirnkrankheiten, in Notthnagel, Hermann: Spezielle pathologie und Therapie, Vienna, Alfred Hölder, 1901, vol. 9, pt. 3.

6. Duret H.: Notes sur la pathologie des traumatismes cérébraux, Gaz. méd. de Paris, 1877, pp. 598-601, 612-615, 624-626.

Ferrari⁷ ingeniously placed capillary tubes filled with colored fluid and cover glasses in various parts of the brain; after concussion there was no breakage less than 5 mm. from the surface. It was observed that concussion effects were most marked in areas of transition between gray and white matter, substances of different densities. Apparently the transmitted force underwent a change of rhythm or pace, producing disruption of normal anatomic structure or disturbance of physiologic function. Kocher cited a celebrated case of cerebral softening,⁸ reported by Hauser, which principally affected the white substance, was not due to vascular occlusion and caused death six days after injury. He held that the main effect was in the direction of the line of impact and that the vibratory method of experimental concussion, "hammering," was not reasonably comparable to the impact blow ordinarily producing concussion.

Scagliosi⁹ first suggested that traumatic myelinic necrosis without infarction was due to damage of the neuroglia, an idea based on Cajal's theory of the nutritive function of this tissue; in support of this idea, Rand and Courville¹⁰ found swollen oligodendroglia cells in injured brains, cells which are in especial maintenance relationship to the nerve fiber. More recent investigations have dealt with cerebral vascular changes such as are produced by the vasovagal reflex, namely, alterations in arteriolar, capillary and venous pressure and in the size of vessels and the resulting changes in blood flow and osmotic relationships. In this manner stasis, edema and anoxemia are produced.

Bright and Rokitsky, according to Gussenbauer,¹¹ first called attention to the presence of "punctiform" hemorrhages in concussion. It was Ricker¹² who first suggested that these small hemorrhages were produced by diapedesis and not by rhexis. He concluded that neurovasomotor disturbances produced vessel dilatation, stasis and consequent anoxemia. Cobb¹³ stated that he did not unconditionally accept Ricker's vasomotor theory of diapedesis because of the relatively feeble nerve supply to the brain vessels. Interest in blood vessel pathology has recently been revived by Cassasa's¹⁴ theory of capillary rupture by rhexis due to tearing of the vessel wall by hydrostatic pressure suddenly transmitted from the subarachnoid space to the perivascular space. Osnato and Gilberti¹⁵ and Martland and Beling¹⁶ have described clinical syndromes of traumatic encephalitis and "punch drunk."

With Dr. Tamaki and Dr. Newman¹⁷ I examined a series of brains of human subjects who had died of head injuries. Serial sections were made of a number of areas showing punctiform or petechial hemorrhages. The petechiae were perivascular and fairly constantly

found in these brains, but they varied in size. They rarely affected the cortex but were found in the subjacent white matter and in the deeper collections of gray matter and in the brain stem. Almost invariably were the hemorrhages the result of diapedesis, observations thus not confirming Cassasa's theory of rupture. Our study was extended to concussion experiments on white rats, the controls being normal, untraumatized animals. By securing the animal on the end of a lever, which would be released at different heights, a traumatic head injury was produced similar to that effected by propulsion impact, a mechanism common in automobile injuries and falls. Petechiae similar to those demonstrated in traumatized human brains were reproduced. A report on these results is as yet unpublished. The traumatized brains were studied at different intervals after trauma. For the most part there were no marked departures from the normal, but in severe brains perivascular gliosis was marked about a few vessels, as has been described and pictured by Rand and Courville.¹⁸ Other vessels were obliterated and replaced by glia, and rarely vessels, obviously damaged, showed aneurysm-like degeneration and irregularities of their walls with fresh perivascular extravasations. We have therefore demonstrated in animals that in certain cases of brain concussion vessel damage is produced which runs a definite course with tendency to reparation but which may cause late accidents by vessel rupture, producing late apoplexies and softenings. As yet, however, we have not demonstrated such a late vascular accident in a series of thirty-five animals. This demonstration of structural brain effects following concussion justifies the designation of "encephalopathy." Functional impairment from vasomotor irregularities may be assumed, but as yet only assumed, to justify the term concussion neurosis.

The course of a moderately severe case of brain concussion is one of quick recovery from the immediate symptoms of shock. The duration of residual symptoms in severe uncomplicated cases rarely exceeds three months and is often considerably shorter. Symptoms of the postconcussional state are headache, vertigo, tinnitus, nervousness (usually described as explosiveness and irritability), impairment of memory (which may include events immediately preceding the accident), impairment of vision, fatigability, poor concentration, sensitiveness to heat and intolerance to alcohol. Examination often reveals a hopeful rather than discouraged patient, with a normal pulse but not infrequently a low blood pressure and a far lower incidence of lively reflexes, vasomotor disturbances and tremors than to be found in the psychoneurotic group.

Severe cases of concussion may be complicated by laceration and contusion. Even moderately severe cases of concussion may be accompanied by small surface hemorrhages of the pia arachnoid, by far the most common of all traumatic lesions. As a rule, contused and lacerated wounds of the brain may be regarded as subject to the same conditions of repair as elsewhere in the body. In the severest cases of brain injury, complicated by contusion, it is probable that the general symptoms and disability, excluding epilepsy and loss of specific function from focal lesions, are due to permanent concussion effects. The postconcussion picture differs from that following a gross lesion, as apoplexy or lobotomy for removal of a brain tumor, as any exper-

7. Ferrari, cited by Kocher, p. 321.

8. Hauser, cited by Kocher, pp. 293-294.

9. Scagliosi, G.: Ueber die Gehirnerschütterung und die daraus im Gehirn und Rückenmark hervorgerufenen histologischen Veränderungen, Virchows Arch. f. path. Anat. 152: 487, 1898.

10. Rand, C. W., and Courville, C. B.: Histologic Studies of the Brain in Cases of Fatal Injury to the Head: III. Reaction of Microglia and Oligodendroglia, Arch. Neurol. & Psychiat. 27: 605-644 (March) 1932.

11. Gussenbauer, Carl: Die traumatischen Verletzungen, Deutsche Zeitschr. f. Chir. 15: 47, 1880.

12. Ricker, Gustav: Die Entstehung der pathologisch-anatomischen Befunde nach Hirnerschütterung in Abhängigkeit vom Gefässnervensystem des Hirnes, Virchows Arch. f. path. Anat. 226: 180, 1919.

13. Cobb, Stanley, in discussion on Schaller and others.¹⁷

14. Cassasa, C. B.: Multiple Traumatic Cerebral Hemorrhages, Proc. New York Path. Soc. 24: 101, 1924.

15. Osnato, Michael, and Gilberti, Vincent: Postconcussion Neurosis—Traumatic Encephalitis: A Conception of Postconcussion Phenomena, Arch. Neurol. & Psychiat. 18: 181 (Aug.) 1927.

16. Martland, H. S., and Beling, C. C.: Traumatic Cerebral Hemorrhages, Arch. Neurol. & Psychiat. 22: 1001 (Nov.) 1929. Martland, H. S.: Punch Drunk, J. A. M. A. 91: 1103 (Oct. 13) 1928.

17. Schaller, W. F.; Tamaki, K., and Newman, Henry: Nature and Significance of Multiple Petechial Hemorrhages Associated with Trauma of the Brain, Arch. Neurol. & Psychiat. 37: 1048-1076 (May) 1937.

18. Rand, C. W., and Courville, C. B.: Histologic Studies of the Brain in Cases of Fatal Injury to the Head: IV. Reaction of the Cerebral Neuroglia, Arch. Neurol. & Psychiat. 27: 1342 (June) 1932.

rienced neurologist can testify. I am not prepared at the present time to define precisely the mechanism or pathology of severe concussion, but sufficient evidence is at hand for one to recognize both the pathologic picture and the clinical course, as distinguished from those of laceration and contusion, on the one hand, and the psychic counterpart, on the other.

THE POST-TRAUMATIC PSYCHONEUROTIC STATE (PSYCHONEUROSIS, HYSTERIA)

The psychoneurotic states following trauma have been variously designated as traumatic neurosis, traumatic hysteria, litigation neurosis and compensation hysteria. I have favored the term post-traumatic psychoneurosis as one which particularly describes this condition, as it includes whatever psychic manifestations of the disorder may be present in the individual case, whether they are of neurasthenic, psychasthenic, hypochondriacal or hysterical nature; it also places the onset not at the time of trauma but after it. By definition a psychoneurosis is a condition of the mind whereby unfavorable mental influences disturb the function of the body through nervous mechanisms. According to Smith,¹⁹ writing on neurosis in students, a psychoneurosis always serves the patient a useful purpose. Schwab²⁰ discerned in the war neuroses and incipient neuroses a defense mechanism. To escape from disagreeable situations there is a subconscious flight or escape into invalidism and conversion of normal bodily functions into abnormal ones. This is typified by the hysterical picture of loss of function but may be expressed by positive symptoms such as pain, uncontrolled motor behavior, anxiety and compulsions. I am aware that this extends the idea of hysteria beyond the usual symptomatic picture. The theory of conversion hysteria, however, should be valid not solely for a conventional pattern of response but also for such patterns as individual suggestibility and concepts dictate.

It appears to me that classifications of the neurotic state based on symptomatology have become unwieldy, and this holds also for the complexities of mental mechanisms sought to explain them. There is need for simplification and more basic concepts. It also appears to me that the compensation neuroses offer a particularly favorable opportunity to study basic motivations and fundamental life situations without the complications of fatigue and changed environment, as found in the war neuroses. A psychoneurosis may be likened somewhat to somatic disease having a comparatively simple etiology but an exceedingly complex symptomatology.

The term psychoneurosis will be used as the inclusive term and hysteria for the usual picture. Oppenheim²¹ unfortunately designated the symptom complex now under consideration as traumatic neurosis, thus emphasizing the traumatic rather than the mental nature of the condition. His theory of a molecular change in the brain cells of course assumed something not in evidence. As one now reviews his writings, one is impressed with the admixture of symptoms now generally agreed on as psychic, such as functional anesthetics and concentric contractions of the visual fields, with symptoms due to concussion or even contusion. The Great War definitely settled the essentially psychic etiology of the

so-called traumatic neuroses. A comprehensive exposition of the subject of the accident neuroses has been contributed by Huddleson.²² Whatever theory one may apply to the cause of hysteria, the theory of suggestion, of freudianism or of conversion, there is general agreement (1) that the mechanism is purely mental, (2) that the condition is curable, (3) that this cure is brought about by mental readjustment and (4) that the cure is often brought about with such dramatic rapidity as to exclude any structural nerve change as playing any role whatever in its production.

Many years' experience leads me to believe that the ultimate psychogenic factors underlying true hysteria consist of the emotional and instinctive reactions of fear and suggestion and of wishful thinking. Serious character defects and adverse mental influences often complicate the picture. Hall and MacKay²³ discerned in the post-traumatic neuroses "marked neurosis or marked ineffectiveness of the personality before injury." Does a man refuse to work because he is covetous, indolent, antisocial, querulous or resentful, dramatizing and enjoying his invalidism; or is he of an essentially apprehensive, suggestible temperament, fearful that by returning to work and thereby forfeiting his compensation he will jeopardize his health by possible relapse of symptoms and his social security by inability to continue at occupation? Obviously, one should receive greater consideration than the other and be more amenable to rehabilitation. Persons with marked character defects are but too eager to capitalize on a minor injury; this desire is often furthered by the sympathy and solicitude of friends and relatives, by lack of occupation and interest and by an undesired compensation award, based on a complete misunderstanding of the case and misdirected treatment, which tend to fix the psychoneurosis. Following injury a period of meditation ensues wherein inadequate personality traits and adverse mental influences combine to create a psychic climax and a point of negative departure from the natural tendency to recovery. This point of negative departure of efficiency is the "precipitation point"²⁴ and averages three months and seventeen days after injury. It is interesting to note that this approximates the independent estimates of Fay²⁵ and Munro²⁶ of reasonable recovery from the ordinary head injury.

In conduct and appearance the post-traumatic psychoneurotic patient is nervous and somewhat tense and depressed, eager to establish his claim of disability and voluble in detail. His good order of thought and memory in regard to his accident and subsequent history are often in striking contrast to his assertion of poor memory and concentration and mental fatigue. He deals in superlatives, picturing in dramatic style the seriousness of his injury and acuteness of his suffering. He is apt to be emotional and querulous and often asserts that he is doubtful of betterment. His complaints are numerous and on recheck examination are frequently amplified and augmented. Headache and dizziness, especially the former, are almost constantly complained of.

22. Huddleson, J. H.: *Accidents, Neuroses, and Compensation*, Baltimore, Williams & Wilkins Company, 1932.

23. Hall, G. W., and MacKay, R. P.: *The Post-Traumatic Neuroses*, J. A. M. A. 102: 510-513 (Feb. 17) 1934.

24. Schaller, W. F., and Somers, M. R.: *Psychogenic Factors and Precipitation Point in the Post-Traumatic Neuroses*, J. A. M. A. 93: 967-971 (Sept. 28) 1929.

25. Discussion of Wechsler, I. S.: *Trauma and the Nervous System*, J. A. M. A. 104: 519 (Feb. 16) 1935.

26. Munro, Donald: *Cranio cerebral Injuries*, Oxford Loose-Leaf Medicine G: 136 (57), 1939.

19. Smith, S. K.: *Practical Modes of Treatment in Handling Mental Hygiene Problems in a University*, Am. J. Psychiat. 13: 57 (July) 1933.

20. Schwab, S. L.: *The War Neuroses as Physiologic Conservations*, Arch. Neurol. & Psychiat. 1: 579 (May) 1919.

21. Oppenheim, Hermann: *Die traumatischen Neurosen*, Berlin, Hirschwald, 1889.

The examination of the psychoneurotic person is often a trial to the physician because of the finching, groaning and gasping which interrupt the different tests. These patients often complain of an actual setback in their illness because of the ordeal of the examination, despite its being made with considerate care. Very often a tremor is present when the patient is asked to extend his fingers; this may diminish or cease on distraction. Sweating and lively reflexes are common. Perhaps the most prominent trait of the neurotic patient is his tendency to exaggerate in his response to tests. For example, he will show no disturbance of gait and yet will respond to tests of muscular force at the ankles by a weakness incompatible with normal walking. He will grip a dynamometer in a stiff-armed, effortless fashion. If he claims hemianesthesia, he will respond to sensory tests on both the affected and the non-affected side with a meditated negativism which betrays a lack of candid response. Often when the limbs are crossed the patient will make flagrant errors in his responses, giving a ridiculous answer in the yes-no test. It is therefore but little wonder that the general practitioner and surgeon not trained in the complexities of psychopathologic reactions consider these patients as malingerers. It is generally held that "tests" for malingering holding valid with reference to organic disease are invalid with reference to hysteria.²⁷ A distinguished psychiatrist, Aaron J. Rosanoff,²⁸ commented on this statement by expressing the opinion that this is a distinction without a difference.

I myself do not feel that every post-traumatic neurotic person of hysterical type is a malingerer, but I do believe it is consistent with the facts to say that he is at least a subconscious simulator. A conscious simulator is a malingerer (to simulate: Latin, *simulo*, *simulatus*, to assume the signs or appearance of, to imitate; to malingere: French, *malingrer*, to feign illness or disability). Malingering, therefore, is of greater moral implication than simulation and may in this regard be likened to the legal term of perjury. As a medical definition I should characterize malingering as conscious, intentional and deliberate deception practiced for profit or gain. Simulation is of milder implication as regards motives and conduct. A patient may show a complete sensory loss in an extremity but also show in ordinary use of this extremity complete physiologic function, namely, sensory orientation, proprioceptive function and subconscious protection from injury. In hysterical paresis unconscious function by conventional patterns is often observed. In this sense, every hysteria is a simulator; simulation and malingering may coexist. A hysteric, in order to impress the examiner, may consciously simulate. Certain tests have been devised in order to determine the good faith of the subject and a number of these are of doubtful value. For instance, a pin may be suddenly thrust into an allegedly anesthetic extremity and the patient brusquely withdraw this extremity. However, that this may be a purely reflex phenomenon is established by a similar reaction in a completely divided spinal cord. Pinching of the allegedly anesthetic skin of the neck may cause a dilatation of the pupil on the corresponding side. The pupil, however, may dilate as a sensory motor reflex without conscious perception.

It is my impression that there has been in late years an increasing tendency of courts and commissions to

be too lenient in dealing with neurotic persons. Two quotations are here relevant, one²⁹ from a lay journal, the other³⁰ from a medical journal, voicing the experience of physicians who served in the Veterans' Administration. Those who have followed cases through the courts and accident commissions have often been greatly surprised by favorable decisions for the applicant based solely on subjective symptoms. Further, an inconsequential injury is stressed which should be considered only as a point of meditative departure for the establishment of a neurosis, and no clear distinction is made between ability to work and lack of desire to work.

In many cases, therefore, a mildly traumatized neurotic patient is compensated for defects in character and temperament rather than for injury. For an alleged injury to be etiologically valid, it should be of such prominence and importance as to be an acceptably dominant causative factor. The traumas or residuals of trauma in the traumatic psychoneuroses are not proximal or dominant factors but are remote and secondary. That this view is not extreme is evidenced by the position of Claude,³¹ in France, who has urged that no compensation be awarded on account of traumatic neuroses of civilians, and in decisions of German courts³² denying compensation for hysteria following trauma.

The prognosis for recovery in the psychoneuroses depends on when and whether the patient's character and temperament, i. e., his personality, can strike a balance with the adverse psychic factors arising both from within and from without himself. In other words, is the patient so mentally constituted, controlled, and desirous for recovery and work that he can overcome adverse and uncomfortable situations and again take his place as a useful member of society and as a social asset rather than a social liability? The greatest help that a psychoneurotic patient receiving benefits can be accorded is final settlement of his claim and return to occupation. This is demonstrated by a follow-up investigation of cases reported by me³³ in 1918.

29. The Betrayal of Popular Government, editorial, Sat. Eve. Post, Nov. 26, 1938: "The weaknesses that now beset popular government, especially our own foremost example of it, are not those of disaffection. They are weaknesses of character, of faith, of conviction, and are manifest in self distrust, in the flight from individual responsibility, dread of pain and hardship, a morbid anxiety about the pulse and circulation, love of security, the habit of turning to the government in every dilemma, the shameless struggle of groups and classes for access to the public purse, and a kind of cynicism that says, 'Because those got theirs, now we shall have ours,' until at last we see a total failure of the stern, parent tradition in American government, and in place of it the idea of beneficent government, a power at Washington, omnipotent and wise, to absorb the people's troubles, to feed and clothe and house them, to divide the national income among them by a rule of wisdom, and increasingly to administer their lives."

30. Aring, C. D., and Bateman, J. F.: Nurturing a National Neurosis. J. A. M. A. 109:1092 (Oct. 2) 1937: "The family life of veterans suffering from psychoneurosis was inquired into both from the veteran and from the wife who occasionally accompanied them. These veterans as a rule report their families well and happy, but their wives tell a different story. It is not unusual for the wife when queried in private to note that a child is 'just like his father,' with many of the same somatic complaints, fears, food fads and addition to medicines, and express rather indirectly her own dissatisfaction. This seemed significant, although we have no statistical data on the subject. It would well form an excellent subject for investigation. It is a remarkable fact that the majority of these men assume the additional responsibility of a wife (repeated marriages seemed quite high in these veterans) and numerous children, despite the lack of energy and numerous complaints leading to invalidism or semi-invalidism. We hold no brief for the strict environmentalist, but children raised in the enervating atmosphere created by these individuals are certainly not bettered by it. Imitation of parents is a large and recognizable factor in the mental development of all of us. The onus for sponsoring a national neurosis therefore is not too large an indictment, when one considers what is taking place in our national life as a result of this unenlightened method of the treatment of a large group of the psychically ill."

31. Claude, Henri: De la nécessité du traitement précoce et judicieux dans les névrose traumatiques, Ann. de méd. lég. 4: 393 (Oct.) 1924.

32. Kollmann, M.: Compensation in Traumatic Neuroses, Deutsch. med. Wchnschr. 52: 1814 (Oct. 22) 1926; abstr. J. A. M. A. 88: 234 (Jan. 22) 1927.

33. Schaller, W. F.: Diagnosis (Prognosis) in Traumatic Neurosis, J. A. M. A. 71: 338 (Aug. 3) 1918.

27. Jones, A. B., and Llewellyn, L. J.: Malingering, Philadelphia, P. Blakiston's Son & Co., 1917.

28. Rosanoff, A. J.: Traumatic Hysteria vs. Malingering, California State J. Med. 30: 197 (March) 1929.

This article does not concern itself with treatment, but it may not be amiss to assert that in the majority of cases of post-traumatic psychoneurosis, especially those of long standing, say over a year, there is no medical treatment or psychotherapy which offers any great chance of success. True, in some cases major hysteria based on fear and suggestion clears up under

TABLE 1.—Comparison of Features Common to the Two Conditions and of Work Efficiency*

	Post-Traumatic Concussion State (Concussion, Traumatic Encephalopathy)	Post- Traumatic Psychoneurotic State (Psychoneurosis, Hysteria)
Headache	77	97
Lively reflexes	46	76
Sweating	38	64
Tremors	33	54
Fast pulse	1	12
Low blood pressure.....	13	3
Attempted work with symptoms, unable to continue.....	11	28
Back at work with symptoms.....	30	6

* In 100 selected cases of concussion with severe head injury and 100 selected cases of psychoneurosis with slight head injury and no appreciable period of unconsciousness. The figures indicate percentages.

intensive persuasive methods reinforced by a lump sum settlement, which also acts as a prophylactic against a relapse. I am of the opinion that more of these patients would recover, or their state perhaps not be established, if no compensation law existed. The treatment of a traumatic psychoneurosis is to recognize its onset at the precipitation point and to make it unpopular and unprofitable. In none of my cases of post-traumatic psychoneurosis do I recall a single instance of the condition following injury to boys at play or in college athletics, boxers, wrestlers or jockeys. This fact, similar to the experience of many others, needs no elaboration.

DIFFERENTIAL DIAGNOSIS

The foregoing discussion of symptoms brings out the considerable difference between the two conditions of organic and nonorganic brain syndromes following trauma. These differences are set forth in the accompanying tables. The mental attitude of the one is different from the other. The neurotic person often resents a diagnosis of minor injury and good prognosis, and his manifest exaggeration and elaboration often produce a heavy strain on the examiner's patience and credulity.

In concussion the picture is one of a general lowering of physical and psychic functions without the emotional, complaining state; frequently distinct euphoria is present. In concussion there is a natural desire for recovery and return to work; this is seen in table 1, which shows that 30 per cent of such patients continued at work with symptoms, in contrast to but 6 per cent in the neurotic group.

The concussion patient often shows amnesia of the accident and for a definite period preceding it and defects of general memory. Concentration is difficult. The neurotic patient is mentally alert. With concussion there is a history of an appreciable period of unconsciousness with more or less severe head injury, often indicated by skull fracture and scalp lacerations. Often the neurotic patient has suffered but a slight blow on the head, and there may be a considerable discrepancy between his description of the accident and the statements of witnesses. Those with concussion spontaneously improve, the neurotic tends to regress. In contrast

to the concussion case, the neurotic shows an inconsistency and variability of symptoms. In concussion there is often a change of character; in the neurotic patient there is an exaggeration of predominant character traits. The course of a concussion case is not affected by settlement of compensation or litigation features; the neurotic person often recovers on such settlement.

Intolerance to heat and alcohol are frequently met in concussion. The neurotic is more apt to show objective signs of nervousness than the patient with concussion.

Twenty-three of 100 patients with concussion presented in table 1 made no complaint of headache. However, headache is an almost constant complaint of the psychoneurotic patient; in my analysis of 100 such cases but three failed to list this complaint, and in these cases the principal symptoms were focused on injury of an extremity. It has been stated that whereas paroxysmal, sharp and localized pain is characteristic of the organic headache, a sensation of constant pressure is typical of the psychoneurotic type. A tabulation of my cases has failed to reveal this distinction, as the headaches in both conditions are variously described as to character, location and duration. This similarity may be explained by the replacement of a true concussion headache by its psychic equivalent in the psychoneurotic person, owing to psychic fixation, and thus also may the difference in incidence be explained.

True vestibular vertigo, often found in the concussion state, is described as a feeling of whirling, and this type may be established by appropriate vestibular functional tests. In the psychoneurotic state the complaint of dizziness is more properly expressed by giddiness.

TABLE 2.—Differential Diagnosis of Major Symptoms

Post-Traumatic Psychoneurotic State (Psychoneurosis Hysteria)	Post-Traumatic Concussion State (Concussion, Traumatic Encephalopathy)
1. Does not wish to work	Wishes to work
2. Depressed, emotional, complaining	Euphoric, aggressive, periods of explosive irritability
3. Mentally alert	Amnesia of injury; memory and concentration difficult
4. Aggravation of inherent personality defects	Changes from original personality makeup
5. Frequently slight injury	Often severe injury, followed by long period of unconsciousness
6. Hysterical symptoms and signs	No hysterical symptoms and signs
7. Exaggeration and elaboration in statement and behavior	No exaggeration or elaboration in statement and behavior
8. Course: tendency to aggravation	Course: tendency to improvement
9. Favorable effect of termination of compensation or of settlement	No effect of termination of compensation or of settlement
10. Multiplicity, changeability, and indefiniteness of symptoms	Constant and precise symptomatology
11. Headache rarely absent	Headache frequently absent
12. Dizziness: giddiness	Dizziness; vertigo
13. No disturbance of tolerance to heat and alcohol	Intolerance to heat and alcohol

The foregoing material describes the contrasting pictures of uncomplicated cases of concussion and psychoneurosis. Obviously, they may coexist in the same patient or be further complicated by organic paralysis from brain laceration and contusion and by malingering. Such a complicated picture may be difficult at times to evaluate, especially in a malingerer. A study of performance in a suspected malingerer when he is unaware of observation is of great value.

Finally, a word as to the responsibility of the physician in the production and recognition of the psycho-

neurotic state. Too often the physician does not realize the suggestibility and apprehension of the ordinary lay person in any circumstance which affects his bodily state or feeling of well-being. An unguarded statement as to the severity of trauma or outlook for recovery, if this carries the idea of any doubt, may precipitate a psychoneurosis. Treatment of the neurotic person for his original injury is often unduly prolonged without the suspicion that his symptoms are mental in origin.

However, the mental origin may be recognized fairly early by the physician in charge of an industrial case, and settlement or final rating of compensation award may be strongly recommended; in this event, responsibility for long-continued treatment without improvement rests on the court or the industrial accident commission referee, who with the commendable intention of protecting the interests of the claimant, refuses to authorize a settlement and insists on further treatment, adopting a "post hoc, ergo propter hoc" attitude. This refusal constitutes a powerful suggestion of serious injury, which falls on fertile ground in the mind of the psychoneurotic, thereby further fixing his neurosis and rendering useless efforts of subsequent treatment.

SUMMARY AND CONCLUSIONS

The term traumatic neurosis should be discarded and replaced by a more fitting and descriptive classification.

After-effects of head injury may be classified as concussion, concussion, psychosis and psychoneurosis, all essentially different conditions.

The post-traumatic concussion state produces reversible changes of brain function which, in severe cases, may become irreversible, with demonstrable pathologic change.

The post-traumatic psychoneurotic state, characterized by fear, suggestion and wishful thinking, is due to the precipitation of psychic complexes, following a period of meditation, in patients presenting inadequate personality traits and subjected to adverse mental influences.

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ABSTRACT OF DISCUSSION

DR. GEORGE W. HALL, Chicago: In cases of concussion the patients are more susceptible to the effects of alcohol. I observed a man with a history of having been able to take alcohol moderately without any disturbances whatever until he became a prize fighter. He was knocked out on one or two occasions and after those incidents his personality changed. At present he is most affable when not under the influence of liquor, but two or three drinks now will make him extremely vicious. On one occasion he threw a milk wagon driver out of his wagon, threw the bottles on the driver and drove off with the car. He drove into a garage, picked up another car and traveled a little farther before he was arrested. He spent about six months in jail for that offense, and a week or two ago he took his mother's new car out and it was found front-first down the stairs of an empty basement as a result of his taking alcohol. Yesterday Dr. Hartman stated that oxygen is the agent for the cure of acute alcoholism. It may be that in these cases of concussion the brain cells are so damaged that they are unable to absorb the oxygen from the blood in the quantities which the brain cells of a normal person can absorb it, and that is so, according to Dr. Hartman, when the person is under the influence of alcohol. I think that point is well taken in Dr. Schaller's paper as one of the differential points between concussion and psychoneurosis. The other point, of course, is the wish fulfillment in the neurotic, whereas patients with concussion do not desire to quit work. I recall another recent instance in which a man worked four months with a headache following an injury, until

finally he suffered such vertiginous attacks that the manager of the concern caused him to lie off from his work. When he came into the hospital he showed none of the signs that one expects to find in cases of psychoneurosis, no sensory disturbances whatever, and his whole ambition was to forget it all and return to work.

DR. SIDNEY I. SCHWAB, St. Louis: I do not know of any way to measure the effect of a head trauma which produces so-called organic changes. Some of the most difficult cases to handle have been cases in which the trauma was insignificant and the long-distance effects, even assuming that they were organically produced, were long and continuous. On the other hand, if we consider the psychoneurosis, we shall have the same difficulty in measuring the effect and violence of the blow or of the trauma in relation to the remote or recent symptomatic results. Whether one calls these after-effect neuroses or concussive syndromes, or whatever designation one chooses to place on them, the question at issue is What is the nature of the damage to the individual? It does not make a lot of difference if the patient is distorted from a personality point of view owing to an organic destruction of brain elements or whether he is distorted from a personality point of view by virtue of the development and evolution of a neurosis. I see no evidence at present by which an organic disease or a neurosis can be differentiated in terms of mechanism and changes or alterations within the neural mechanism. What we are dealing with here in this artificial separation of these two categories of disease is with the method of examination. We do not have delicate enough instrumentations to determine where in between the dividing line, as the author of this paper has so sharply differentiated, organic changes end and other changes begin. While this differentiation clinically is of value, I do not see that it throws any light on the nature of the changes which involve the personality of both the organically affected individuals and those so-called inorganically affected individuals. This type of traumatic disease cannot be differentially diagnosed on parallel symptomatic groups, certainly in any kind of series of cases which have hitherto been published. The percentage of error in personality and personal reaction is so great that the small 200 or 500 cases amounts to no more than imaginative contributions to the truth. This is a valuable paper because it opens up those vital questions which are facing neuropsychiatrists, neurosurgeons and internists the world over, the association and the coordination and penetration of what was formerly called organic changes into the total life of the organism. Our neuropsychiatric duty is to assess the damages to the person and not to assess the damages in points of litigation.

DR. HARRY E. MOCK, Chicago: Dr. Schaller's paper contains material of value to general practitioners, who see a great number of head injuries and first come in contact with the complications following head injuries. It is natural that as neurologists we should discuss the cerebral pathology and the terminology. The chief point, whether we call it "concussion syndrome" or "persistent cerebral contusion," is that something has happened to that individual's brain from the head injury, be it a slight injury or a serious injury, which causes persistence of symptoms. The skull fracture exhibit which we have at this meeting is visited by many doctors from the smaller communities, and the commonest question asked is What would you do in this case? The histories are usually the same: This housewife, this farmer, this school child had a slight injury, a blow, a fall or an automobile accident and remained unconscious two or three hours. Most of these patients are treated in their homes, most of them remaining quiet in bed for a short period, but after a few days of activity they complain of headaches, dizziness and ringing in the ears, they become despondent and they cry easily or are aggressive. Some of these inquiring doctors think the condition is simply mental, others that it is a traumatic neurosis, while others are anxious to know whether there is any remaining pathologic condition in the brain. In my work many cases are referred for examination with the statement from the referring doctor or insurance company that the patient is a malingerer or a traumatic neurotic. About 80 per cent of these will show some neurologic manifestations or evidence of persistent increased pressure by spinal puncture and manometer reading, while the remaining 20 per cent have no signs and belong in the psychoneurotic group. A careful

study of this so-called post-traumatic concussion group reveals incomplete treatment during the acute stage, an unsympathetic attitude and a misunderstanding of the condition of the patient during his convalescent stage by his doctor and his family and, in many instances, a prolongation of the condition into a true psychoneurotic condition by compensation and litigation problems. Too many are prone to consider all the cases as belonging in the latter class. This is wrong, for many a true traumatic syndrome following a head injury continues even after the settlement is made. The majority of these require a regimen of treatment quite similar to that which they should have had during the acute condition, namely, absolute rest in bed, reduction of the persistent increased intracranial pressure, sometimes by lumbar puncture, usually by a carefully guided dehydration program, and, above all, the avoidance of all disturbing influences until their symptoms have abated. Only a few of them will require encephalography and neurosurgical treatment.

DR. R. P. MACKAY, Chicago: It is not a problem as to whether the patient has either structural damage or psychologic damage but as to how much of each he has. That means that we must not only evaluate the extent to which a neurosis may be present but we must attempt to find out, even if a neurosis is present, to what extent there is also an organic lesion. One syndrome is exceedingly common in these cases. I refer to the postural vertigo and headache which at least half the patients with considerable head injury show, and it is so stereotyped that it could not possibly be due to psychologic factors. The patients report that if they lie in a particular position they have rotary vertigo or that turning the head in a certain direction will produce the vertigo. Not infrequently the headache will be brought on by a certain position or movement of the neck or head. This is one more syndrome which seems to indicate that structural changes have occurred. What the mechanism for the production of the syndrome is I do not know, but I am sure it is "organic" in nature.

DR. LEOPOLD BRAHDY, New York: I want to state briefly my experience. I tried lump sum settlements in industrial compensation cases but they proved a failure. I now tell the postconcussion patient that he may have lighter work at his regular wages for a specific period of time; that a job is there for him if he wants to take it; that if not, his compensation will continue; that if he cannot resume his usual work at the end of the specified time he will be put back on compensation. I have had excellent results with this method. The symptoms have not always disappeared (some complain of headaches from one to three years afterward) but these men are working and are in good health. Dr. Schaller said that the onset of psychic symptoms is about three and one-half months after injury. I think my procedure has shown that the important factor in preventing development beyond the organic damage done by the concussion is to get such a patient back to work. That is a form of therapy the beneficial effects of which cannot be obtained by occupational therapy in an institution, useful as that may be in other conditions. Such a patient must get back to his normal environment among his fellow workers, doing something he regards as real work for wages. This procedure has been successful with me. I should like Dr. Schaller to comment on whether in some of these cases the differential diagnosis by laboratory methods, especially encephalograms, isn't undertaken too early. It does not matter whether we find out from two months to six months after an injury that we are dealing with encephalopathy. If the symptoms are psychoneurotic, we do not help a psychoneurotic patient by subjecting him to encephalograms when a delay of a few months will clarify the diagnosis without such procedure. If it is an encephalopathy, we shall know soon enough that we cannot help him.

DR. WALTER F. SCHALLER, San Francisco: In answer to Dr. Hall: It was the question of the significance of traumatic petechial hemorrhages that led me to the consideration of concussion pathology. The majority of these punctiform hemorrhages in brains showing no gross lesions are due to diapedesis and not to rhexis. Such petechial hemorrhages are not lesions which are produced or which cause damage at the time of accident. Patients do not die from petechial hemorrhages, and these are probably not the most important pathologic change in concussion. It was difficult to present a paper on a subject of

this scope and importance in fifteen minutes. Perhaps five years ago I should have accepted Dr. Schwab's position as to the impracticability of a differential classification between the two conditions discussed, but since I have studied the minute pathology of brain trauma and clinically analyzed a large group of cases of both functional and organic nature I have arrived at the conclusion that it is high time that a differential diagnosis be formulated and all these cases, even though their symptoms and signs may be somewhat similar, not be thrown into the grab-bag of what is often called "post-traumatic head syndrome." I am not aware that any such tabulation as I have made has been attempted heretofore. If my tables do not show the differentiations that I believe are possible and desirable between concussion and psychoneurosis, better tables should be prepared. Serious concussion effects may occur from slight injuries in individuals who are particularly vulnerable. In answer to Dr. Brahdy: I consider laboratory methods of undoubted value in differential diagnosis, particularly when we wish to rule out gross lesions and contusions. The cases here reported were seen an appreciable time after injury, and in such cases, and also in those in which the acute symptoms have subsided, I do not consider encephalography contraindicated.

THE PREVENTION OF CAROTENE ABSORPTION BY LIQUID PETROLATUM

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It has been shown by several workers¹ that, when rats were fed diets supplying the provitamin carotene, vitamin A deficiencies developed if liquid petrolatum was added to the diets in amounts comparable to the accepted dosage for human beings. Dutcher, Harris, Hartzler and Guerrant² have reported experiments showing that the carotene of a mixture of carotene and liquid petrolatum was not utilized when fed to animals but that the vitamin A of a carotene-free cod liver oil concentrate mixed with liquid petrolatum was absorbed quite readily from the gastrointestinal tract. They believed that the lack of absorption of carotene was due to the greater solubility of the hydrocarbon carotene in the hydrocarbon liquid petrolatum and that vitamin A was absorbed because of the greater solubility of the sterol vitamin A in the sterols of the gastrointestinal tract. Further work by Mitchell³ and by Jackson⁴ confirms the difference in the effect of ingested liquid petrolatum on the absorption of carotene and vitamin A in animals. Dutcher, Harris, Hartzler and Guerrant² have shown that animals eating a diet of known carotene content apparently absorbed most of it, for but little carotene was excreted in the stools. This small amount, however, was constant and did not increase even though the carotene content of the diet was considerably increased. When liquid petrolatum was given to animals on this diet the amount of carotene

From the Department of Internal Medicine, University of Michigan Medical School.

1. These include:

Burrows, M. T., and Farr, W. K.: *Proc. Soc. Exper. Biol. & Med.* **24**: 719 (April) 1927.

Dutcher, R. A.; Ely, J. O., and Honeywell, H. E., *ibid.* **24**: 953 (June) 1927.

Moness, E., and Christiansen, W. G.: *J. Am. Pharm. A.* **18**: 997 (Oct.) 1929.

Rowntree, J. L.: *J. Nutrition* **3**: 345 (Jan.) 1931.

Jackson, R. W., *ibid.* **4**: 171 (July) 1931.

Dutcher, Harris, Hartzler and Guerrant.²

Mitchell.³

Jackson.⁴

2. Dutcher, R. A.; Harris, P. L.; Hartzler, E. R., and Guerrant, N. B.: *J. Nutrition* **5**: 269 (Sept.) 1934.

3. Mitchell, H. S.: *Proc. Exper. Biol. & Med.* **31**: 231 (Nov.) 1933.

4. Jackson, R. W.: *J. Nutrition* **7**: 607 (June) 1934.

excreted in the stools was roughly proportional to the amount of liquid petrolatum ingested.

One of us⁵ has reported experiments on adult patients showing that plain liquid petrolatum given in amounts of 20 cc. before each meal or 20 cc. before the morning and evening meals would lower blood carotene

TABLE 1.—*The Effect of Various Preparations of Liquid Petrolatum, Taken in Amounts of 20 Cc. Three Times a Day Before Meals, on the Blood Carotene Levels of Patients on a Constant High Carotene Diet of 24,089 International Units of Vitamin A*

Preparation	Blood Carotene Determinations, Dichromate Units							
	Diet Only					Diet Plus Liquid Petrolatum Prep.		
	Fast-ing	4th Day	8th Day	11th Day	14th Day	4th Day	9th Day	12th Day
Liquid petrolatum, agar and water....	8.0	11.5	13.0	12.0	12.5	10.5	8.0	6.0
Emulsified liquid petrolatum.....	7.0	8.0	13.0	14.0	14.0	12.0	10.0	7.0
Liquid petrolatum with 0.26% carotene	17.0	19.0	23.0	24.0	25.0	23.0	22.0	21.0
Liquid petrolatum with 0.28% carotene	6.0	9.0	10.0	12.0	12.0	12.0	12.0	12.0

levels previously elevated by a high carotene diet. In each study the patients ate weighed diets of known constant high carotene and caloric values. In part of this experiment the liquid petrolatum was discontinued and only the diet continued. The blood carotene values, which previously had remained constant or even decreased, would rise appreciably. Plain liquid petrolatum in the amount of 30 cc. taken before retiring seemed to us at that time to have little measurable effect on carotene absorption.

Because many human beings obtain much of their vitamin A by conversion of the provitamin carotene into vitamin A and in view of the frequency that one of the many preparations of liquid petrolatum is prescribed for the relief of constipation or as a substitute for fat in a

TABLE 2.—*The Effect of Various Preparations of Liquid Petrolatum, Taken in Amounts of 20 Cc. Twice a Day Before the Morning and Evening Meals, on the Blood Carotene Levels of Patients on a Constant High Carotene Diet of 30,000 International Units of Vitamin A*

Preparation	Blood Carotene Determinations, Dichromate Units							
	Diet Only				Diet Plus Liquid Petrolatum Prep.			
	Fast-ing	3d Day	7th Day	10th Day	3d Day	8th Day	15th Day	20th Day
Liquid petrolatum, agar and water....	7.0	10.0	10.0	10.5	10.0	8.5	6.0	5.5
Emulsified liquid petrolatum.....	6.5	8.0	10.0	12.0	10.0	9.5	8.0	7.0
Liquid petrolatum with 0.26% carotene	6.0	8.0	11.0	13.0	12.5	10.5	9.0	8.5
Liquid petrolatum with 0.28% carotene	7.0	9.0	10.0	10.0	12.0	12.0	12.0	13.0

reduction diet regimen, it seemed to us important to determine whether a 65 per cent emulsified solution of liquid petrolatum, agar and water and an 80 per cent emulsion of liquid petrolatum would have the same relative effect on removing carotene from the food of the gastrointestinal tract as plain liquid petrolatum. It also seemed important to determine whether liquid

petrolatum, presaturated with carotene both at room and at body temperature, would protect the carotene contained in the food of the gastrointestinal tract.

METHODS

In general, three types of experiments were carried out. In each of the three experiments, four different patients were given diets of constant caloric and carotene values. The diets were weighed and consisted of two menus, which were alternated daily to afford variety. The patients remained on these diets throughout the experiment. The vitamin A value of the daily diet in the first experiment was 24,089 international units of vitamin A. The vitamin A value, expressed in international units, of the second and third experiments was 30,000.

In the first experiment each patient ate a weighed diet for a period of fifteen days. Following this interval the first patient in this experiment was given 20 cc. of a solution of liquid petrolatum, agar and water three times a day before meals. The second patient received the same amounts of a solution of emulsified liquid

TABLE 3.—*The Effect of Various Preparations of Liquid Petrolatum, Taken in Amounts of 30 Cc. Before Retiring, on the Blood Carotene Levels of Patients on a Constant High Carotene Diet of 30,000 International Units of Vitamin A*

Preparation	Blood Carotene Determinations, Dichromate Units										
	Diet Only						Diet Plus Liquid Petrolatum Preparation				
	Fast-ing	3d Day	6th Day	7th Day	9th Day	10th Day	4th Day	5th Day	7th Day	8th Day	10th Day
Liquid petrolatum, agar and water.....	10.0	12.0	....	13.0	....	13.0	....	13.0	....	13.0	....
Emulsified liquid petrolatum	8.0	11.0	11.0	....	13.0	....	12.5	....	....	11.0	....
Liquid petrolatum with 0.26% carotene...	7.0	8.5	10.0	....	9.0	....	9.0	....	....	8.5	....
Liquid petrolatum with 0.28% carotene...	14.0	20.0	22.0	....	....	22.0	27.0	....	....	27.0	....

petrolatum. The third patient received the same amounts of a solution of liquid petrolatum saturated with carotene at room temperature (0.26 per cent). The fourth patient received similar amounts of a solution of liquid petrolatum saturated with carotene at body temperature (0.28 per cent). All patients in the first experiment received the various preparations of liquid petrolatum for eleven days. No attempt was made to mix the preparations of liquid petrolatum with the food, but since the liquid petrolatum was given before mealtime there must have been such a mixing in the gastrointestinal tract. Blood carotene determinations were done at intervals throughout all three experiments by the method of White and Gordon.⁶ The mixture of carotene and liquid petrolatum was not unpleasant to taste. It was orange in color with an aromatic odor like fresh raspberries and tasted somewhat like fresh pumpkin.

The second experiment was a counterpart of the first except that before the morning and evening meals the patients were given 20 cc. of solutions of liquid petrolatum, agar and water; emulsified liquid petrolatum; liquid petrolatum with 0.26 per cent of carotene, and

5. Curtis, A. C., and Kline, E. M.: Influence of Liquid Petrolatum on the Content of Carotene in Human Beings, *Arch. Int. Med.* 63: 54 (Jan.) 1939.

6. White, F. D., and Gordon, E. M.: *J. Lab. & Clin. Med.* 17: 53 (Oct.) 1931.

liquid petrolatum with 0.28 per cent carotene. The four patients in the second experiment remained on the diet of 30,000 international units of vitamin A for eleven days and then, in addition to the diet, took one of the several preparations of liquid petrolatum for twenty days.

The third experiment was likewise a counterpart of the first experiment except that, before retiring, when the upper part of the gastrointestinal tract was probably empty, the patients were given 30 cc. of solutions of liquid petrolatum, agar and water; emulsified liquid petrolatum; liquid petrolatum with 0.26 per cent of carotene, and liquid petrolatum with 0.28 per cent carotene. All patients in this group received the diet of 30,000 international units of vitamin A for ten days and the diet plus one of the preparations of liquid petrolatum for eleven days thereafter.

RESULTS

It will be seen in table 1 that all patients had a rise in the blood carotene levels during the period when they were taking only the high carotene diet. However, when either of the solutions of liquid petrolatum, agar and

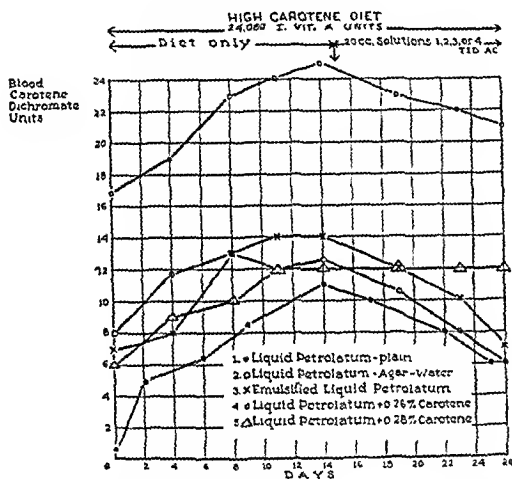


Chart 1.—A comparison of the effect of 20 cc., taken three times a day, of plain liquid petrolatum, liquid petrolatum, agar and water, emulsified liquid petrolatum, liquid petrolatum saturated at 22 C. with carotene and liquid petrolatum saturated at 37 C. with carotene on the blood carotene levels. The plain and emulsified types of petrolatum have about the same relative effect. Liquid petrolatum, presaturated with carotene at room temperature, slightly protects the ingested carotene. When liquid petrolatum presaturated with carotene at body temperature is given, the blood carotene level remains constant.

water or emulsified liquid petrolatum was given in amounts of 20 cc. before the three meals the blood carotene levels promptly fell. When a solution of liquid petrolatum with 0.26 per cent carotene was given the blood carotene level remained more constant than with the other two preparations, thus partially maintaining the higher blood carotene level reached when the high carotene diet alone was eaten. When a solution of liquid petrolatum with 0.28 per cent carotene was given, the blood carotene level remained constant.

Table 2 again shows the rise in blood carotene values which occurred when the diet alone was eaten for a period of eleven days. When 20 cc. of either the solution of liquid petrolatum, agar and water or emulsified liquid petrolatum was taken for a period of twenty days before the morning and evening meals, the blood carotene fell to a level lower than the original in the first instance and just short of the original level in the second instance. When a solution of liquid petrolatum with 0.28 per cent carotene was given, the blood carotene level rose three dichromate units in twenty days.

Table 3 shows that when 30 cc. of solutions of liquid petrolatum, agar and water, emulsified liquid petrolatum, liquid petrolatum with 0.26 per cent carotene, or liquid petrolatum with 0.28 per cent carotene is used nightly for eleven days following a period of ten days on constant diets of 30,000 international units vitamin

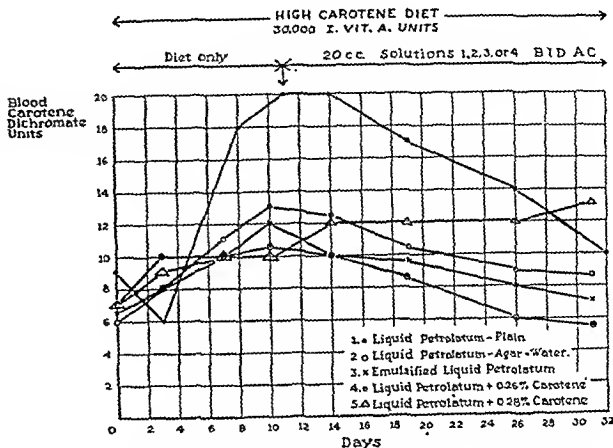


Chart 2.—When 20 cc. of the same preparations is used twice a day before meals the same relative effects are noted as in chart 1.

A, the effect of the petrolatum on the absorption of carotene is variable. The administration of the solution of liquid petrolatum, agar and water caused no reduction of the blood carotene level. The solution of emulsified liquid petrolatum possibly caused a slight reduction of the blood carotene level. This slight reduction was also evident when plain liquid petrolatum containing an added 0.26 per cent carotene was admin-

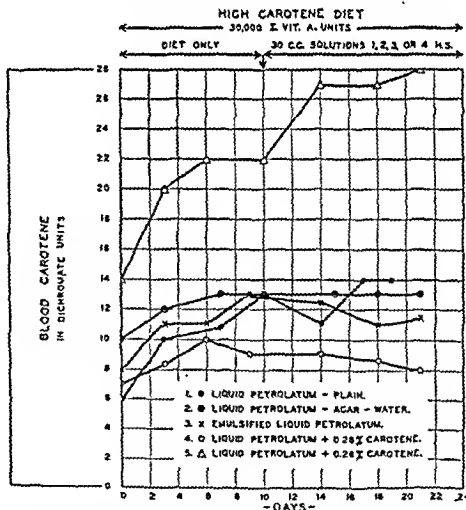


Chart 3.—When the five different preparations of liquid petrolatum are given in amounts of 30 cc. before retiring, none have any marked effect on blood carotene levels except the preparation of liquid petrolatum presaturated with carotene at body temperature (37 C.). The increase in blood carotene levels when this preparation was given suggests that even 30 cc. of plain or emulsified liquid petrolatum given before retiring affects the ability of the intestinal tract to absorb carotene from ingested food.

istered. When liquid petrolatum with added carotene in amounts of 0.28 per cent was taken, the blood carotene level actually rose.

COMMENT

The results of the experiments listed show that solutions of liquid petrolatum, agar, water and emulsified liquid petrolatum taken in amounts of 20 cc. three times a day before meals or 20 cc. twice a day before

the morning and evening meals interfered with the transportation of carotene across the epithelium of the intestine, if the fasting blood carotene levels may be used as an index for such absorption. Liquid petrolatum, saturated with carotene at room temperature (0.26 per cent) and taken in similar amounts still interfered with the carotene absorption from the food of the intestinal tract. When liquid petrolatum saturated with carotene at body temperature (0.28 per cent) was taken in amounts of 20 cc. either three times a day or twice a day before meals, the blood carotene levels remained constant or even increased slightly.

The effect of the two emulsified types of liquid petrolatum was not striking when taken in amounts of 30 cc. before retiring. The 0.26 per cent carotene saturated liquid petrolatum also seemed to have little effect. But when the effect of these three preparations are compared with the 0.28 per cent carotene saturated liquid petrolatum, it suggests that even in doses of 30 cc. nightly liquid petrolatum interferes with the organism's ability to absorb carotene from the ingested food.

In a previous experiment one of us⁶ showed the effect of 20 cc. of a plain liquid petrolatum taken three times daily, twice daily and in amounts of 30 cc. taken before retiring on carotene absorption from ingested food. If the results of these experiments are compared with the effects of similar doses of liquid petrolatum, agar and water, emulsified liquid petrolatum, and 0.26 per cent and 0.28 per cent carotene saturated liquid petrolatum (charts 1, 2 and 3)⁷ it is apparent that the emulsified types of liquid petrolatum remove about the same amount of carotene from the food of the intestinal tract even though the oil content of the emulsified types of liquid petrolatum is 65 per cent and 80 per cent respectively. When added carotene is present in amounts of 0.26 per cent at 0.22 C. the absorption of carotene by liquid petrolatum from ingested food is reduced, but it still occurs. When liquid petrolatum saturated with carotene at body temperature (0.28 per cent at 37 C.) is given, the ingested carotene bearing foods are protected and the blood carotene levels do not decline.

It was not apparent at first why liquid petrolatum saturated with carotene at room temperature failed to protect the carotene of ingested food while saturation at body temperature did so, for the difference in saturation was only 0.02 per cent. Is is easily explained, however, if one expresses the saturation of liquid petrolatum with carotene at these temperatures in international vitamin A units. At body temperature it requires 280,000 international vitamin A units of carotene to saturate 60 cc. of plain liquid petrolatum. At room temperature it requires 240,000 international vitamin A units of carotene to saturate 60 cc. of plain liquid petrolatum. This difference of 40,000 units in the saturation of liquid petrolatum with carotene at room and body temperatures is greater than the total number of vitamin A units in our high carotene diets. These calculations also show the relative unsaturation of liquid petrolatum as far as carotene is concerned and also make it understandable why even 30 cc. of liquid petrolatum interferes with the absorption of carotene by the gastrointestinal tract.

CONCLUSIONS

1. Two emulsified types of liquid petrolatum, the first containing 65 per cent liquid petrolatum, 1 per cent agar and 34 per cent water, and the second containing 80 per cent liquid petrolatum, 1 per cent agar and 19

per cent water, were given in amounts of 20 cc. three times a day before meals, twice a day before meals and 30 cc. before retiring. The effect of these emulsified preparations of liquid petrolatum on the absorption of carotene from the gastrointestinal tract was compared with the effect of similar doses of plain liquid petrolatum and found to be comparable.

2. Plain liquid petrolatum, saturated at room temperature with carotene (0.26 per cent at 22 C.) still removes carotene from ingested food, but in lesser amounts.

3. Plain liquid petrolatum saturated with carotene at body temperature (0.28 per cent at 37 C.) prevents the petrolatum from removing carotene from the food in the gastrointestinal tract.

STREPTOCOCCUS VIRIDANS BACTEREMIA FOLLOWING EXTRACTION OF TEETH

A CASE OF MULTIPLE MYCOTIC ANEURYSMS IN THE PULMONARY ARTERIES; REPORT OF CASES AND NECROPSIES

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AND

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Streptococcus viridans is constantly present in alveolar infection and frequently enters the blood stream when these infected areas are traumatized. Other organisms are less regularly present and *Streptococcus viridans* enters the blood stream from this focus much more frequently than all others combined. The resulting bacteremia is usually transient, but a knowledge of the frequency and mechanism of its occurrence is essential to an understanding of the pathogenesis of the secondary foci of localization—notably subacute bacterial endocarditis. It is our purpose in this paper to reveal our experience as to the frequency of bacteremia following tooth extraction and to portray the consequences incident thereto through the report of (1) well studied clinical cases with postmortem examinations and (2) bacteriologic examination of the teeth and blood of persons undergoing tooth extraction.

REPORT OF CASES

CASE 1.—*History*.—A white man, aged 44, a patient of Dr. Arthur Pearman, had always enjoyed satisfactory health in spite of the known presence of a congenital cardiac lesion. Because of the congenital anomaly of the heart he had been spared strenuous activities but had been able to carry on in ordinary school and business life without physical complaint. Immediately after the extraction of several teeth in December 1936 he complained of weakness, sweating and mild prostration and had a fever of the septic type. The morning temperature was usually normal, but there was a temperature of from 100 to 101 F. each evening. The pulse was 110 and the blood pressure 138 systolic, 75 diastolic. The area of cardiac dullness was enlarged approximately 2 cm. to the left. There was a loud harsh roaring "machinery murmur," with its greatest intensity at the second and third interspace to the left of the sternum. In spite of the great intensity, it was not widely transmitted and did not extend more than 5 cm. in any direction from the area of the pulmonic valve. The murmur was systolic in time and continued throughout most of the diastole. The spleen was palpable but not painful. The hemoglobin was 11 Gm.; red blood cells numbered 4,290,000 and white blood cells 8,350. Blood culture yielded *Streptococcus viridans*.

From the Laboratory of the Rockford Hospital.

EXTRACTION OF TEETH—PALMER AND KEMPF

1789

The course had a duration of one year and there was but little variation. Petechiae in the skin or mucous membranes were never observed. He had drenching night sweats, afternoon fever and a gradually developing pallor. Cyanosis was not observed. Only during the last four weeks did he complain of pain. This was in the "lungs" and he was unable to lie on either side. Positive blood cultures for *Streptococcus viridans* were obtained on each attempt.¹ The patient died in December 1937 with evidence of increasing cardiac failure. The clinical diagnosis was subacute bacterial endocarditis implanted on a congenital anomaly.

Necropsy.—There was a small amount of fluid in each pleural cavity. The heart was surrounded by 500 cc. of serofibrinous exudate and the pericardial surfaces had a shaggy "bread and butter" appearance. The heart weighed 550 Gm. and had a transverse diameter of 16 cm. The right side was especially enlarged. The pulmonary artery was greatly enlarged. The pulmonary leaflets were thickened by large gray vegetations and thrombi. The valve was incompetent. Vegetative masses extended upward on the wall of the pulmonary artery, and on the left lateral wall there was a mycotic aneurysm 4 cm. in diameter. This was partially lined by clot, but the wall of the artery was completely destroyed and the pericardium was sacculated. This lesion explained the origin of the pericarditis. *Streptococcus viridans* was present in the pericardial exudate. The orifice of the left pulmonary artery was at the upper limit of this aneurysm. Anterior to this opening was the orifice of a patent ductus arteriosus 1.5 cm. in diameter (fig. 1). There was much calcification of the wall of the ductus arteriosus and of the adjacent areas in the pulmonary artery and aorta. The lungs were edematous and relatively atelectatic throughout. Dissection of the pulmonary arteries revealed multiple mycotic aneurysms (figs. 2 and 3). They varied in diameter from a few millimeters to 3 cm., and most of them were occluded by fibrinous clot. None of them showed evidence of suppuration.

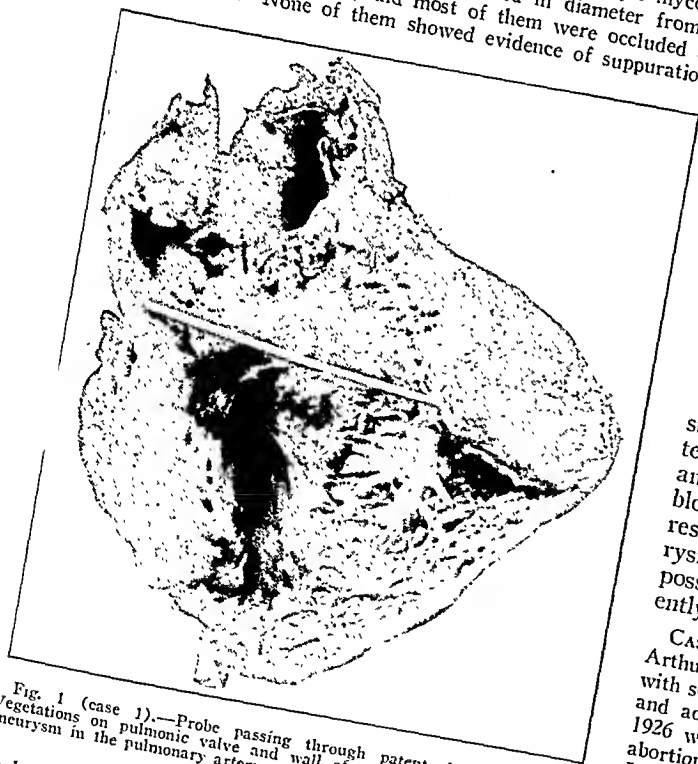


Fig. 1 (case 1).—Probe passing through patent ductus arteriosus. Vegetations on pulmonic valve and wall of pulmonary artery. Mycotic aneurysm in the pulmonary artery. Pericarditis.

Embolitic phenomena were not demonstrated in any part of the greater circulation. Changes in the organs were those that accompany sepsis and chronic passive congestion. The spleen weighed 620 Gm. and measured 20 cm. from pole to pole. It was firm and had the uniform red color of reticulo-endothelial hyperplasia. Microscopically the aneurysms showed the internal

elastic membrane ruptured and the sac formed mostly of adventitia. In the kidneys a few glomerular capillaries contained large numbers of polymorphonuclear leukocytes, and still fewer showed pericapsular areas of inflammation. The picture of multiple embolization of the glomeruli was not present. Microscopic examination of other tissues added nothing to the gross interpretation.

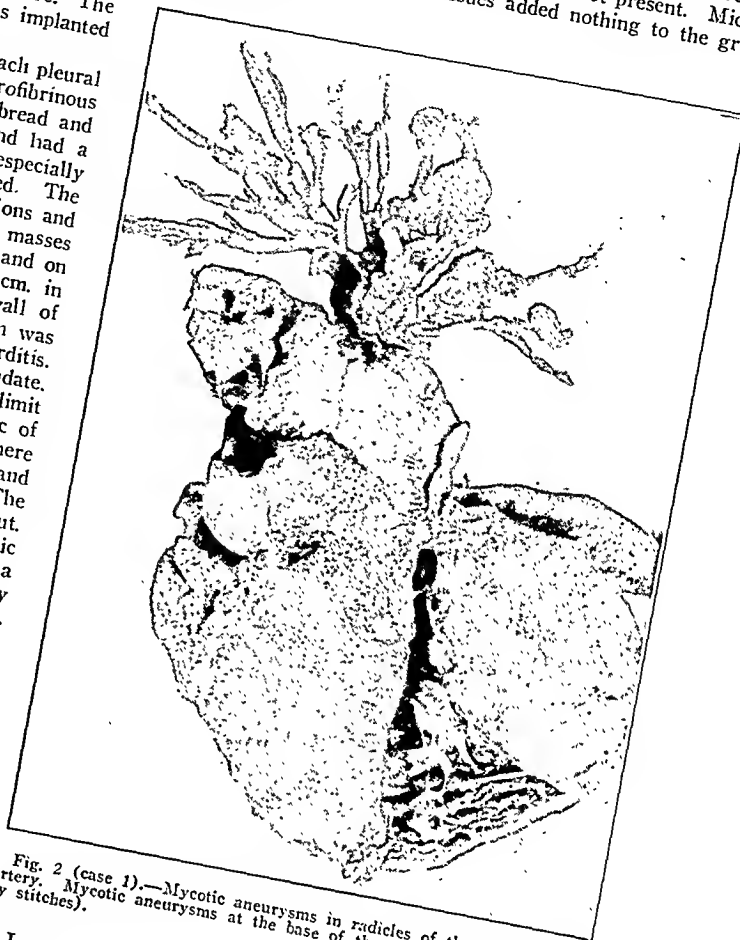


Fig. 2 (case 1).—Mycotic aneurysms in radicles of the left pulmonary artery. Mycotic aneurysms at the base of the pulmonary artery (closed by stitches).

In spite of a congenital cardiac lesion, the patient subjectively was entirely well until he had a number of teeth extracted. Signs of sepsis developed immediately and *Streptococcus viridans* was recovered from his blood. Embolization within the pulmonary circulation resulted in the development of multiple mycotic aneurysms. Embolization within the greater circulation was possible through the patent ductus arteriosus but apparently did not occur.

CASE 2.—History.—A white woman aged 35, a patient of Dr. Arthur Pearman, had rheumatic fever at the age of 4 years, with several indefinite but probable recurrences during childhood and adolescence. Tuberculous cervical adenitis developing in 1926 was successfully treated by x-rays. In 1928 therapeutic abortion was performed because of high grade mitral stenosis. In January 1937 she was under treatment for oral sepsis of a pyorrheal nature and for repair of her teeth. She had gone to the dentist feeling well. Procaine hydrochloride was injected into the gums. She returned home, experienced a chill, and her temperature reached 104 F. The chills were repeated; the fever was high and of the septic type; drenching sweats debilitated her. She became mildly icteric and obviously very ill. Her pulse ranged around 120. The blood culture yielded 260 colonies of *Streptococcus viridans* per cubic centimeter of blood. The physical manifestations were those of mitral stenosis and aortic regurgitation; a tender spleen was palpable 3 cm. below the left costal margin; numerous petechiae appeared in the skin and conjunctivas, and tender finger and toe pads developed

1. Haden, R. L.: Experimental Evidence of Relation of Dental Infection to Systemic Disease, *J. Kansas M. Soc.* 26: 41-47 (Feb.) 1926.

with splinter hemorrhages. The hemoglobin was 8.5 Gm.; red blood cells numbered 3,300,000 and white blood cells 16,200. Urine contained 1 plus albumin and a trace of chemical blood, and the sediment was loaded with pus cells.

The course had a duration of six months. There were frequent showers of emboli to the spleen and into the skin. A high grade of sepsis with increasing evidence of cardiac failure characterized her illness.



Fig. 3 (case 1).—Close view of mycotic aneurysms in the radicles of the left pulmonary artery shown in figure 2.

Necropsy.—Petechiae in the skin and mucous membranes, slight clubbing of the fingers and slight dependent edema were found on external examination. There was fluid in all the cavities. The pericardial sac was filled. It measured 20 cm. in diameter and reached the lateral wall of the chest on the left. The heart measured 12 cm. in transverse diameter and weighed 310 Gm. The left auricle was enormously enlarged, measuring 10 cm. in depth. Along the posterolateral wall of this cavity were a number of coarse thrombi and smaller vegetations varying from gray to red. The mitral valve was greatly thickened and the chordae tendineae were shortened (fig. 4). The leaflets were fused and the orifice, which was fixed and measured only 1 cm. in diameter, was closed by a fresh thrombotic mass which was continuous with older gray vegetations on the valve. The aortic valve presented similar changes. There was an old rheumatic lesion and the ventricular surfaces were studded with vegetative masses. The edges of the cusps showed moderate ulceration. The spleen weighed 480 Gm. It showed hyperplasia of the reticulo-endothelium and numerous areas of infarction in various stages of development. The kidneys weighed 320 Gm. They were gray, mottled with red streaks. Microscopically they showed multiple embolization of the glomerular capillaries. The changes in the other organs were those of sepsis and chronic congestion.

In this case, though no teeth were extracted, there is a history of very closely connected onset of sepsis with dental manipulation, including the traumatization incident to injection of procaine hydrochloride. A chill with high fever marked the onset almost immediately after the manipulation of the focus. An old rheumatic lesion furnished the "suitable soil" for implantation. Richards'² experiments are of interest in relation to this case. He obtained positive blood cultures in three of seventeen cases following massage of the gums. About the same percentage of his cases yielded positive blood cultures after massage of the tonsils. In two of his cases there was a chill following the massage of the tonsils. The condition is apparently comparable to catheter fever.

CASE 3.—History.—A girl aged 18 years, a patient of Dr. H. D. Countryman, had rheumatic fever with endocarditis at the age of 8 years. Following the acute attack she had evidence of mitral stenosis with insufficiency. At the age of 14 some teeth were removed and a dental bridge was fitted without

accident. Three years later she returned to the dentist for "extensive repair work." Her health at this time was "as well as usual." Several of the teeth were devitalized and filling of the root canals was undertaken. Most of the work was done under infiltration with procaine hydrochloride. Within a few days after this dental program had been started, she complained of chills, fever, night sweats and loss of strength. She continued to keep dental appointments for a week but then found it necessary to give up. Painful finger and toe pads developed. There was a harsh systolic murmur over the mitral area, with a presystolic thrill. The murmur was transmitted to the axilla. The border of the left side of the heart was outside the mid-clavicular line. The spleen was palpable and tender. It reached 4 cm. below the costal margin. The hemoglobin content was 65 per cent; red blood cells numbered 3,330,000 and white blood cells 5,150. Blood cultures taken on three successive days yielded pure cultures of *Streptococcus viridans*. There were more than 50 colonies per cubic centimeter of blood. Cultures taken bimonthly were positive throughout the course, which lasted five months, ending fatally. The urine contained small amounts of albumin and a small number of pus cells throughout the course.

Necropsy.—The pleural and peritoneal cavities contained large amounts of fluid. The pericardial sac was obliterated by dense fibrous adhesions. The heart weighed 550 Gm. and presented marked enlargement of the left auricle and both right chambers. The mitral leaflets were thickened and fused and the chordae tendineae were thickened and shortened. Large vegetative masses were found on this valve and extended from it upward on the septal wall of the left auricle and downward over the



Fig. 4 (case 2).—Vegetative endocarditis engrafted on scarred mitral valve.

papillary muscles. The left coronary artery was occluded near its orifice by an embolus made up of vegetative material. Microscopically the capillaries of the kidney glomeruli contained emboli.

This child, with a healed rheumatic lesion in the mitral valve, had the onset of a septic course during the progress of extensive dental repair under local anesthesia. Death was due to coronary embolism.

2. Richards, J. H.: Bacteremia Following Irritation of Foci of Infection, J. A. M. A. 99: 1496 (Oct. 29) 1932.

CASE 4.—History.—A man aged 60, a patient of Dr. Anna Weld, experienced chills and fever and was confined to his home for six weeks following the extraction of his lower teeth. Prior to this he had complained of "heart trouble," but there is no accurate description of a preexisting cardiac lesion. He had recovered sufficiently to return to work when removal of the teeth from the badly diseased upper gum area was decided on. This experience was followed immediately by chills, afternoon fever, lassitude, loss of strength, loss of weight and night sweats. *Streptococcus viridans* was recovered from the blood stream. There was physical evidence of a mitral lesion. The course was septic and he died within six months. Necropsy was not permitted.

The clinical history suggests that bacteremia was established following the first extractions, with possible recovery. Progressive fatal bacteremia with evidence of *Streptococcus viridans* endocarditis followed immediately on the massive extraction of the upper teeth.

BACTERIOLOGIC STUDY: RESULTS OF BLOOD CULTURES FOLLOWING EXTRACTION OF ONE OR TWO TEETH

In an unpublished bacteriologic study of the roots, root canals, pulp and periapical tissues of a large number of diseased deciduous teeth extracted in the Childrens Hospital in Iowa City in 1927 and 1928, we were impressed by the presence, usually in pure culture, of *Streptococcus viridans* in more than 90 per cent of the teeth from which cultures were taken.³ Beta-hemolytic streptococci and diphtheroid bacilli were found in this work. The teeth were removed with technic as nearly aseptic as possible; the root was separated with a sterile saw and placed in 70 per cent alcohol for from three to five minutes. It was then washed with two changes of sterile physiologic solution of sodium chloride and dropped into a tube of deep meat broth (1 per cent dextrose fresh veal infusion broth with a cube of beef at the bottom of each tube, p_H 7.4). Subsequently the broth was streaked on blood agar. It has been our experience and the experience of others⁴ that adult teeth, when diseased, yield the same high percentage of *Streptococcus viridans*.

During the past year, with Joseph A. Hopkins, D.D.S., cooperating, we have made blood cultures on eighty-two patients who had dental extractions under local anesthesia. We purposely selected patients who were not to have more than two teeth removed and made no attempt to determine whether or not there was infection in the apical areas. Okell and Elliott⁵ in 1935 reported a very high percentage of positive blood cultures immediately after massive extraction of teeth from highly diseased alveoli. We were interested in learning the result of blood cultures in persons who have one or two teeth pulled for any reason. The teeth in our series were removed because they were dead, diseased beyond repair or for other reasons not related to this study. All the patients had negative cultures of blood taken immediately before operation. Fourteen of the eighty-two, or 17 per cent, gave positive cultures with blood taken immediately after the extraction. In thirteen of the fourteen positive cultures the blood was sterile ten minutes later. The other bacteremic case yielded organisms in the circula-

tion ten minutes after the operation. The patient, a man aged 65, suffered from arteriosclerotic heart disease. He left the community soon after the extraction and passed out of our control. We learned that he had a continuous fever and died after several weeks. A necropsy was not performed. Elevation of temperature did not develop in the other thirteen cases of transient bacteremia. In eleven of the cases yielding positive blood cultures the organism was *Streptococcus viridans*; in two *Staphylococcus aureus* (hemolytic) was cultured, and in the remaining case a diphtheroid bacillus was recovered.

COMMENT

Streptococcus viridans, admitted to the blood stream by extraction of teeth, occasionally localizes in areas of the vascular system other than the heart. The following record is an example: A woman aged 59 who suffered from hypertensive heart disease had several teeth extracted. This was followed by severe occipital headache and dizziness. There was a rise in temperature, which within a week reached a level of 104 F. Coma developed and she died eight days after the extraction. A ruptured mycotic aneurysm of a sclerotic cerebellar artery was found at necropsy. *Streptococcus viridans* was recovered from the brain tissue.

From the oral and pharyngeal mucous membranes there are two paths by which bacteria break through the protective lining of the dental arches. Miller⁶ writes: "The first is by bacterial penetration through defects in the crown of the tooth produced by caries, erosion or accident. The second break is in the epithelial covering occurring at the junction of the gum and the crown of the tooth." By the first route the pulp and periapical area become infected. The second route results in pyorrheal pockets and infection of the bone of the alveolar process; the cementum becomes exposed and in severe cases the apical area is reached. The dental pulp then becomes strangulated and infected. It is evident, therefore, that the apical area and pulp may be reached by either route. The second route probably is frequently considered important to the health of the teeth but too infrequently as a portal of entry in the pathogenesis of distant infection.

Rosenow,⁴ Henry and Doyle⁴ and many others have recovered streptococci from a high percentage of pulpless teeth, irrespective of whether roentgenograms were positive or negative for periapical infection. In 1926, Russell Haden¹ published a very careful study of cultures from the periapical tissue of 1,500 teeth. Streptococci were present in 92.5 per cent, staphylococci alone in only 1.3 per cent, gram-positive bacilli alone in 3.8 per cent.

Okell and Elliott⁵ found that a transient *Streptococcus viridans* bacteremia occurred in eighty-four (60.9 per cent) of 138 patients who underwent dental extraction. In cases of severe alveolar infection, 75 per cent of the patients who underwent multiple extractions had positive blood cultures immediately after the operation. In general, these authors found that the occurrence and degree of bacteremia depended on the severity of the alveolar infection and the amount of damage done at the operation. That the bacteremia was of short duration was shown by the fact that blood cultures taken in all their cases ten minutes or more after the operation was completed remained sterile. In this series Okell and Elliott also found twelve positive blood cultures in blood taken before operation from 110

3. This work was done in the Department of Pathology and Bacteriology of the State University of Iowa College of Medicine. The department was directed by Dr. G. H. Hansmann.

4. Rosenow, E. C.: Oral Sepsis in Its Relationship to Focal Infection and Elective Localization, *J. Am. Dent. A.* 14:1417-1438 (Aug.) 1927. Henry, G. W., and Doyle, Mary C. H.: Focal Infection in Teeth, *Am. J. Psychiat.* 8:5 (March) 1929. Haden,¹

5. Okell, C. C., and Elliott, S. D.: Bacteremia and Oral Sepsis, with Special Reference to Etiology of Subacute Bacterial Endocarditis, *Lancet* 2: 869 (Oct. 19) 1935.

6. Miller, I. S.: Dental Infection and Systemic Disease, *Dent. Digest* 36:145-154 (March) 1930.

of the patients. In other words, 10.9 per cent had bacteremia irrespective of operative procedures. They speak of this as a "leak" of bacteria into the blood stream from the focus and quote Lewis and Grant as referring to an "almost physiological entry" of organisms into the blood stream of the average person.

The direct historical relation between foci in the mouth and the onset of subacute bacterial endocarditis has been stressed by some writers.⁷ This group of authors report twelve cases of subacute bacterial endocarditis with onset following the extraction of teeth. Necropsies were not performed in nine of the twelve cases, and bacteriologic studies were not made in six.

Three of our four case reports are from a group of twelve cases in our necropsy records. Of the twelve, two additional cases gave suggestive histories of onset following manipulation of infected alveoli. The other records are not complete in this respect; it is necessary that the history taker be conscious of this possibility if accurate records are to be made.

Cecil⁸ has reviewed the bacteriologic studies reported and has suggested clinical application of the information gained. Carr⁹ has reviewed the literature. He writes "The unfavorable or harmful results following the surgical treatment of such foci, especially in connection with cardiac disease, are events of sufficient importance to impose on us the duty of caution." Evidence that the teeth and tonsils are of first importance as portals of entry for this organism has become predominant. This evidence has provoked serious thought and makes the treatment of oral sepsis in the presence of a debilitating condition, particularly a cardiac lesion, a serious problem. A more widespread understanding of the simple fact that organisms are easily disseminated from such a focus is necessary for better treatment.

SUMMARY

Seventeen per cent of a group of eighty-two patients who had not more than two teeth extracted had transient bacteremia. In 13.4 per cent the organism was *Streptococcus viridans*. In four cases of subacute bacterial endocarditis the onset of septic symptoms dates from the time of dental manipulation.

Bacteremia is present in an appreciable percentage of cases of severe oral sepsis independent of operation.⁶ Organisms "leak" into the circulation from such foci. Traumatization of the diseased alveoli laden with *Streptococcus viridans* causes dispersion of these organisms through the blood stream in a high percentage of cases. The percentage is roughly parallel to the severity of the infection in the gums and to the extent of the operative procedure. This may be purely mechanical dispersion rather than invasion. In persons with a normal vascular system and a normal defense mechanism, this form of bacteremia is relatively unimportant. The circulation is usually cleared of the invaders within

a few minutes.¹⁰ Hypersusceptibility of the tissues due to long continued oral sepsis is speculated on by Cecil.⁸ In persons who have preexisting rheumatic valvular lesions or congenital defects in the heart, localization of the organism on such vulnerable areas during the transient bacteremia, which so often follows dental operations, may herald the beginning of an engrafted bacterial endocarditis.

A CLINICAL STUDY OF ACNE IN UNIVERSITY STUDENTS

FRANCIS W. LYNCH, M.D.

ST. PAUL

The etiology of acne remains obscure in spite of the investigative opportunity afforded by the high incidence of this disease. It has been studied from the point of view of specific infection, focal infection, allergy and disturbed metabolism of carbohydrates, fats and halogens, but none of these factors have been accepted as a specific etiologic agent. Recent interest has been directed toward a relation with the endocrine system, suggested by the onset of acne at puberty and its usual disappearance with sexual maturation, the frequent exacerbation with the menses and its reported absence in eunuchs.

A number of observers have demonstrated abnormal amounts of estrogenic or androgenic principles in the blood or urine of patients with acne. Although these studies suggest a relationship between acne and the endocrine system, the individual variations are considerable and there must be some doubt as to the significance of averages among groups of patients when there is so little uniformity within each group. These apparent hormonal deficiencies can as yet be regarded only as associated with acne rather than as a demonstrated cause of the disease. Particularly disappointing are the relatively poor results of treatment of acne with estrogen or androgen.

It is the opinion of many that acne is often accompanied by clinical evidence of endocrine disease, and this association is regarded as etiologically significant. It has also been said that acne is frequently accompanied by menstrual irregularity, but no one has recorded sufficient clinical evidence to prove a causal relationship.

In order to determine how frequently acne is associated with other clinical phenomena, observations were made on three groups of students at the University of Minnesota. Routine physical examination of students at the time of their registration in the university provides a large amount of general data, but there is a lack of detailed information as to the condition of the hair and skin; the presence or absence of acne is recorded by the staff physicians but its character, severity and extent are not accurately described. In the first and largest group of students, these data were analyzed to determine the relation between acne and the character of the menses in 3,119 cases and the relation to the form of the body and the weight in 4,235 cases.

10. Progressive septicemia due to highly virulent organisms is an occasional accident following dental operations but is not considered in this paper.

From the Student Health Service, Dr. Ruth Boynton, Director, and the Division of Dermatology, Dr. H. E. Michelson, Director, University of Minnesota.

Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

7. Bernstein, Mitchell: Subacute Endocarditis Following Extraction of Teeth (Case), *Ann. Int. Med.* 5: 1138-1144 (March) 1932. Brown, H. H.: Tooth Extraction and Chronic Infective Endocarditis, *Brit. M. J.* 1: 796-797 (April 30) 1932. Calvy, P. J.: Dental Surgery and Organic Heart Disease, *J. A. M. A.* 74: 1221 (May 1) 1920. Vanderhoof, Douglas, and Davis, Dewey: Subacute Bacterial Endocarditis Following Extraction of Teeth with Report of Two Cases, *Virginia M. Monthly* 60: 151-154 (June) 1933. von Phul, P. V.: Subacute Bacterial Endocarditis: Three Cases Following Extraction of Teeth, *Northwest Med.* 32: 188-191 (May) 1933. Abrahamson, L.: Subacute Bacterial Endocarditis Following Removal of Septic Foci, *Brit. M. J.* 2: 8-9 (July 4) 1931. Rushton, M. A.: Subacute Bacterial Endocarditis Following Extraction of Teeth, *Guy's Hosp. Rep.* 80: 39-44 (Jan.) 1930.

8. Cecil, R. C.: The Bacteriology of Dental Infections and Its Relation to Systemic Disease, *New York State J. Med.* 32: 21 (Nov. 1) 1932.

9. Carr, J. G.: Relationship Between Dental and Cardiovascular Disease, *J. Am. Dent. A.* 24: 1979-1988 (Dec.) 1937.

In the second group were 481 consecutive new students subjected to more careful dermatologic examination. Their records were reviewed for additional diagnoses resulting from the general examination as well as for the weight and form of the body and the character of the menses. They were questioned as to their habits of facial and scalp hygiene and the frequency of bowel movement. In each case the scalp was examined for evidence of seborrhea and the face and trunk were observed for acne. Although no attempt was made to count the individual lesions, the acne was graded as mild, moderately severe or severe. The duration, extent and distribution of the eruption were also recorded. The color and texture of the hair were similarly classified by practical rather than scientific standards.

In the third group were students who came to the health service for treatment. Of these patients, 251 were studied in the same manner as those in group 2. For an additional 120 students applying for treatment the basal metabolic rate was determined, and they were carefully questioned as to the character of the menses and the course of their eruption. Repeated changes in the length of the menstrual cycle were regarded as significant if there was a variation of more than three days from the accepted average of twenty-eight days. Since there is considerable doubt as to the endocrine influence in dysmenorrhea, this symptom was reviewed separately and was disregarded unless it required going to bed each month. A menstrual flow having a duration of three days or less was regarded as significant oligorrhea.

INCIDENCE OF ACNE

The incidence of acne as recorded on the routine examination was of little value because of the large number of examiners and the tendency for minor degrees of the disease to be ignored by some of the physicians. Among the 481 students undergoing the special examination on admission, the boys were subject to the disease more often than the girls and the severity of their eruption was considerably greater. This increased incidence was observed at each age level from 17 to 21 years.

TABLE 1.—Incidence of Acne Among 481 Students

	No Acne, per Cent	Acne, per Cent		
		1+	2+	3+
Boys (229).....	43	29	24	4
Girls (252).....	54	31	14	1

Since all these patients were university students, the incidence at various ages does not give a true picture of the course of acne. The median age of the boys was 19 and of the girls 18 years. The fact that the median age in the severe cases was no higher than that in the mild ones suggests but does not prove that severity is not related to the duration of the disease. The higher incidence among boys may be due only to the age of the group; acne develops at a later age in boys than in girls.

CHARACTER OF THE ERUPTION

A greater severity of involvement among the boys was further demonstrated by the character and distribution of the eruption. Pustular forms of acne were more common among boys, while papular eruptions were present equally in the two sexes.

In a group of 277 boys and 219 girls the trunk was involved much more often among the boys, but in both sexes the face was the most common site, with the back next and the chest least often involved.

COURSE OF THE DISEASE

It was found that the course of acne was seldom regular and that irregularity was about equally common to boys and girls. In most cases having an irregular course, the exacerbations were associated with the menses. Abnormal menses were twice as common among girls having such a premenstrual flare-up.

RELATION TO BODY BUILD

In a group of 4,235 boys and girls whose body build was classified as hypersthenic, sthenic or asthenic there

TABLE 2.—Relation of Acne to Body Build Among 4,235 Students

		Without Acne, per Cent	With Acne, per Cent
Boys	Hypersthenic.....	8	9
	Sthenic.....	86	84
	Asthenic.....	6	7
Girls	Hypersthenic.....	10	12
	Sthenic.....	52	56
	Asthenic.....	38	32

was no relation between the form of the body and the presence of acne. The boys showed fewer variations from the sthenic build than did the girls.

For the group of 666 students examined more carefully, similar observations were recorded. The only statistically significant variation was the observation that asthenic girls are unlikely to suffer from severe forms of acne.

The classification of body build as hypersthenic, sthenic or asthenic is admittedly not the most satisfactory from an endocrine standpoint, but it was thought that significant endocrine abnormalities might become evident because of the large number of students examined. Since there is no doubt that variations in endocrine function may affect the form of the body, probably in relation to the thyroid, pituitary, adrenal and gonadal secretory activity, it may be worth while to review another group of patients following more accurate morphologic classification such as has recently been established for girls.¹

RELATION TO BODY WEIGHT

Deviation from normal standards of weight are occasionally but not always an indication of endocrinopathy. In these records a variation from standard averages greater than plus or minus 10 per cent was regarded as abnormal. In neither series of students were significant differences noted with reference to the presence or the severity of acne. (Regardless of the presence or absence of acne, girls were likely to weigh less and boys more than the "normal" figures.)

BASAL METABOLIC RATE

Of the methods used for determining endocrine abnormality, the metabolism test is the only one which allows accurate comparison of the results with accepted standards. This test is chiefly a measurement of the activity of the thyroid gland but abnormal rates may also result from disease in other glands.

It is well known to students of metabolism that girls utilize less energy than boys. This difference is taken

1. Bayer, Leona M.: Build in Relation to Menstrual Disorders and Obesity, *Endocrinology* 24: 260 (Feb.) 1939.

into account in the establishment of normal standards of metabolic rate as expressed in percentages. Thus, although ± 0 per cent represents a lower level of metabolic activity in girls than in boys, the figure is in each case the normal or average for other persons of the same sex, age and body area. This point is emphasized because in a series of forty-three boys and seventy-seven girls with acne the average basal metabolic rate of the girls was significantly lower than that of the boys. Rates deviating from the normal by more than ± 10 per cent were equally numerous in the two sexes, but in the girls more of the abnormal rates were low and

mal menses was considerably higher (40 per cent). This figure is in agreement with the statements of many writers but it is not known whether this represents a significant difference from girls without acne. The facts could be obtained only by requiring a larger group to keep a written record for at least six months. In this smaller series of girls, the incidence of abnormal menses was apparently greater as the severity of the acne increased.

TEXTURE AND COLOR OF THE HAIR

Texture of the hair was investigated because it was thought that the size of the hair follicles would be likely to influence the tendency to acne. Fine hair was much more common than coarse hair in the entire group. It was noted that severe acne was slightly less common in girls with fine hair, but statistical methods indicated that the amount of variation was probably not significant.

There was no relation between the color of the hair and the presence of acne. In Sallenbach-Keller's series⁴ there was an increased incidence of acne among those with darker hair, but Cunningham and Lunsford⁵ in records of the complexion found that brunettes had a slightly better chance of escaping acne.

ASSOCIATION WITH SEBORRHEA, HYGIENE, CONSTIPATION AND FOCI OF INFECTION

Boys were noted to have seborrhea more often than girls. In both sexes seborrhea was more common among those with acne and the incidence increased with the severity of the acne.

The results of inquiry as to the frequency of washing the face indicated that girls without acne wash less frequently, as had been noted by Hinrichsen and Ivy.⁶ This lack of attention is perhaps a natural result of lack of need for attention. Among the boys there was no association between the incidence of acne and the frequency of washing.

The incidence of constipation was negligible in both sexes whether or not acne was present.

TABLE 4.—Basal Metabolic Rates of Forty-Three Boys and Seventy-Seven Girls

	Boys	Girls ^a
Lower than -10%.....	6	16
-1 to -10%.....	11	26
	17 (40%)	42 (58%)
+1 to +10%.....	18	21
Higher than +10%.....	8	10
	26 (60%)	31 (42%)

* A result of $\pm 0\%$ was reported for two girls.

A wide variety of additional diagnoses was recorded but the only condition which appeared to have any significance was focal infection of the nose or throat, which was much more common in boys than girls. It is possible that this infection is related to the increased incidence of papular and particularly pustular lesions in boys as compared with girls.

THERAPY

The age of onset and the course of acne suggest that this disease is related to the endocrine system, and chemical determinations of estrogen and androgen in

TABLE 3.—Relation of Acne to Body Build Among 666 Carefully Examined Students

		Without Acne, per Cent	With Acne, per Cent		
			1+	2+	3+
Boys	Hypersthenic.....	7	4	7	8
	Sthenic.....	86	89	82	81
	Asthenic.....	7	7	11	11
Girls	Hypersthenic.....	10	9	9	9
	Sthenic.....	78	68	87	91
	Asthenic.....	12	23	4	0

in the boys more were high. When the patients were not classified by sex, those having plus rates were equal in number to those having minus rates.

In boys or girls plus rates were twice as common among those having involvement of the trunk as among those whose acne was limited to the face. When the eruptions were graded as to severity but not extent, the records suggested that higher rates were found in the more severe cases among both boys and girls, but statistical methods of analysis failed to demonstrate that this apparent trend was significant. A larger series might clarify this point.

RELATION TO THE MENSES

One of the best clinical means of estimating the normality of endocrine function is the menstrual history. Since the patient's statement of character of the menses is usually accepted by the physician, it is unfortunate that such histories are not dependable. It has been shown in college students that at least one third have only an inaccurate knowledge of their menstrual cycle.² Thus it is obvious that no menstrual history or group of histories can provide conclusive evidence unless the patients have kept written records.

Since any significant difference might become evident because of the large number of persons studied, these data based on routine questioning of 1,214 girls with acne and 1,905 without acne are reported, even though probably inaccurate. Analysis of the percentage of subjects with each type of menstrual difficulty showed striking agreement in the two groups. Thirteen per cent gave a history of irregularity, menorrhagia or amenorrhea, and an additional 4 per cent in each group suffered from severe dysmenorrhea. Further subdivision of these students according to age did not significantly change the proportions, perhaps because only a relatively small number were over 21 years of age (8 per cent of those with acne and 11 per cent of those without). A similar lack of relation to the menses was also noted by Cunningham and Lunsford.³

Eighty girls with acne were questioned in greater detail and among them the apparent incidence of abnor-

2. Boynton, Ruth, and Treloar, A.: Personal communication to the author.
3. Cunningham, R. L., and Lunsford, C. J.: Acne: A Statistical Study of Possible Related Causes, California & West. Med. 35: 22 (July) 1931.

4. Sallenbach-Keller, Lily: Akne Vulgaris und Pubertät: Inaugural Dissertation, Zurich, 1930.
5. Hinrichsen, Josephine, and Ivy, A. C.: Incidence in the Chicago Region of Acne Vulgaris, Arch. Dermat. & Syph. 37: 975 (June) 1933.

the urine or blood indicate that there may be some association with the gonadal secretions, but the results of endocrine therapy of acne have not been satisfactory. The administration of thyroid substance, estrogen, androgen or the sex-stimulating principle of the pituitary gland may in selected cases result in considerable improvement, but there are many failures after the routine use of such preparations. There are obvious objections to giving active hormonal therapy to a group of adolescents having no gross evidence of endocrine disease; in particular the prolonged use of estrone or testosterone might easily have an undesirable inhibitory action on the pituitary gland. In order to avoid some of the objections to injection therapy and yet to give the estrogenic agents another trial, a series of patients was treated by use of a cream containing a modified estrogen. The cutaneous application of estrogen is known to be followed by a systemic effect and also by a local action on the epithelial structures.

A series of forty-nine girls with acne were treated by the external use of the dihydro form of estrogen. Improvement was noted in 72 per cent of these patients, a proportion which would suggest that this is a therapeutic method of value; but the validity of this conclusion is questioned after observation of similar improvement in 64 per cent of girls in a control series who used the same ointment base without estrogen. This lack of response to local estrogenic therapy and the relatively unsatisfactory results of estrogenic and androgenic injections are disappointing to one who seeks to link acne and the secretory organs.⁶

COMMENT

The purpose of this study was to search for clinical evidence relating acne and endocrine imbalance, an association suggested particularly by the age of onset and the course of acne. The microscopic pathology, the clinical appearance of the eruption and the results of treatment give little evidence to prove or disprove such a relationship. Chemical and biologic studies of the urine and blood show some variations in hormone content but do not prove that acne is an endocrine disease.

A number of observers have made statements which, if true, would be further evidence for associating the endocrine glands and acne. For example, it has been said that acne does not occur in persons with alopecia, a statement with which I cannot agree. Others have said that acne always disappears with marriage, but there are numerous exceptions to this rule. Riley⁷ stated that irregular sex practices possibly cause acne persisting after marriage.

Several serious attempts have been made to correlate acne and other clinical symptoms,⁸ but none of them have been very successful. Sallenbach-Keller established a relationship between the onset of acne and the appearance of the menses, and Cunningham's evidence suggests an association with enlargement of the thyroid gland. Numerous writers have commented on the incidence of irregular menses in about a third of girls having acne but have not shown that this rate is significantly higher than normal.

In my series of 3,119 girls the incidence of abnormal menses was not related to the presence or absence of

acne. Although girls with severe acne had a greater tendency to abnormality of menstruation, it is not unlikely that the incidence of abnormal menses is higher when associated with severe examples of any disease whether or not the disease is endocrine. Abnormal menses were twice as common among girls having a premenstrual flare-up.

The records of 4,235 university students did not show any significant association between acne and the weight or form of the body except that asthenic girls may perhaps be less likely to suffer from severe forms of acne. This is obviously not an observation on which extensive conclusions can be based.

Girls with acne were found to have lower metabolic rates than boys with the disease. Higher metabolic rates were recorded for both sexes when the eruption was extensive. These observations are probably significant but I am unable to explain them.

Study of the color and texture of the hair failed to indicate any association with acne.

Seborrhea, more severe involvement with acne, more extensive eruptions and a pustular tendency were observed more commonly in the boys, but these features have no evident association with endocrine disease.

SUMMARY

As a result of this review I am unable to point out any clinical evidence which might aid in establishing an etiologic relationship between acne and endocrine imbalance. There appears to be a relationship to abnormal thyroid function, but this is demonstrable only by changes in the basal metabolic rate and is not a clinical observation. In severe cases of acne there is some association with menstrual irregularity but in milder cases this association is not evident. With reference to acne of a mild or moderate degree, it is hardly possible to say more than that it accompanies the process of puberty and sexual maturation.

350 St. Peter Street.

ABSTRACT OF DISCUSSION

DR. J. G. HOPKINS, New York: Dr. Lynch's collecting and analyzing of this great body of data puts us all in his debt. We now have some facts to study and from these some of us may draw different conclusions. The outstanding thing seems the age incidence, 47 per cent in girls and 51 per cent in boys, wasn't it, in a group of the mental age of a college freshman? I suppose that would be a calendar age of about 18.

DR. LYNCH: The age was 19 in the males and females.

DR. HOPKINS: Well, at that age Bloch reported even higher percentages, which may be due to the different populations sampled or to a different interpretation of what are the lower limits of acne. Both reports lead to the conclusion that at that age the person with acne is the normal; the person without acne is the abnormal. Now the fact that it is in a sense a normal occurrence at the time of arrival at sexual maturity or shortly thereafter does not, of course, prove that it is of endocrine origin, but it seems to me strongly suggestive of an essential endocrine basis. In his data one other thing stood out confirming the general belief that an exacerbation, by which we probably mean a development of pustules, occurs quite regularly with the menstrual period. I think it is hard to dodge the implication that that means endocrine action. As to this we have more direct evidence in reported studies on excretion of estrogen in these patients. While the observations of Kurzrok and Rosenthal of a complete absence of excreted estrogen in the majority of acne patients have not been confirmed, I don't think they have been controverted and subsequent reports of similar studies have pointed somewhat in the same direction. These interesting data give us much to think about and analyze. I think it is possible to draw slightly different conclusions from those which Dr. Lynch presented.

6. The result of treatment of these patients is reported in greater detail in a brief paper (Arch. Dermat. & Syph., to be published). The material was provided by Dr. Gregory Stragnell, Schering Corporation, Bloomfield, N. J.

7. Riley, Ian D.: Testosterone Propionate in Acne Vulgaris, Brit. J. Dermat. 51:119 (March) 1939.

8. Cunningham and Lunsford.² Sallenbach-Keller.⁴ Hinrichsen and Ivy.³

DR. R. L. SUTTON JR., Kansas City, Mo.: My interest in acne is the practitioner's problem of curing the patient. I offer a hypothesis about its etiology. Bloch wrote: "Only the comedo [first] phase of acne can be brought into direct relationship with endocrine processes. The second phase is characterized by an inflammatory process on the basis of infection. It may follow the first, but this is not inevitable." If the inflammatory phase were the result of infection with *Corynebacterium acnes*, said to be present invariably, the second phase ought to be inevitable. It is not, and I believe that the saprophyte has been unjustly maligned. Bloch assumed that inflammation implies infection, overlooking the fact that the inflammatory phase of acne is foreign body reaction to lipid. It is a tuberculoid reaction which has caused pathologists to confuse acne with tuberculosis. It results from the introduction of lipid into mesodermal tissues and has nothing to do with parasitism. It may result from bruising a comedo or from injecting lipoidal material into the skin as Sabin injected fractions of *Mycobacterium tuberculosis*. Hass injected fatty acids of olive oil and cod liver oil and learned that less saturated fatty acids are more irritating. A comedo once formed, like a xanthomatous deposit, cannot be resorbed easily. Its resorption requires an inflammatory lesion. Phagocytism perhaps is instigated by discontinuity of the epithelial barrier separating comedo from mesoderm. Trauma can cause the breach. Foreign body reaction may take place shallow or deep, and phagocytes may attack either solid, well saturated lipid or liquid, less saturated material. The clinical picture varies with the location and severity of the inflammatory process. Acne vulgaris I define as the disease which consists of tuberculoid inflammatory reaction to sebum which is abnormal because of improper metabolism of lipid. Acne is a kind of pustular lipoidosis. In contrast with primarily mesodermal lipoidoses (xanthomatoses), acne is primarily epidermal lipoidosis with secondary inflammation. Acne depends on excessive ingestion of oil: milk, cream, ice cream and butter are chief offenders; so are pork and cod liver oil. Girls get acne when they try to gain weight by drinking milk and taking cod liver oil. Acne depends on hormonal influences through the interrelationship of thyroid function and lipid metabolism. Lipemia designates hypothyroidism more dependably, Hurxthal proved, than basal metabolic rate determinations. Vitamin A is concerned, for its excess counteracts the patient's autogenous supply of thyroxine. When one's intake of lipid and vitamin A exceeds one's ability to metabolize them, one may develop deposits in the sebaceous glands, to which may develop inflammatory reactions. Treatment based on this etiologic interpretation works in practice.

DR. J. D. FARRIS, Richmond, Ky.: Dr. Lynch's paper is particularly interesting to me because as a college physician in a state college I deal with this age group of young people and the sexes are about equally divided. I wish to corroborate the many points that he brought out in this particular subject and wish to state that I have found many of the same points to be true in the examinations of several thousand boys and girls over the last few years. He mentioned using estrogenic substance in the paste or ointment and I wonder what his experience has been in using it hypodermically, or some product such as antuitrin-S. I myself have had some rather good results in these cases, quite satisfactory to the young people, by injections of these substances.

DR. FRANCIS W. LYNCH, St. Paul: I have no report on the results of treatment by the injection of estrogenic agents because I have not felt justified in administering such treatment as a routine to these students. Dr. B. A. Watson of the student health service has been in communication with Dr. Sutton and we have been stimulated by Dr. Sutton's theory as to the pathogenesis of acne. A boy with a severe, chronic, papular and pustular acne involving the face and trunk was placed, on a measured and weighed diet for two months, part of the time with low, normal and high fat content. With these diets we failed to note any influence on the blood cholesterol level or any significant association with the course of the eruption. At one period the eruption improved noticeably while the diet was high in fat content. This one case is reported not as conclusive evidence but merely as a single experiment. I hope that Dr. Sutton will report on a series of patients treated according to his suggestions. Dr. D. W. Cowan at the health service has recently

performed vitamin C determinations in the blood of several hundred students. In reviewing the results of these studies, he failed to observe any association between the vitamin C level and the presence or absence of acne. I did not acquire this information in time to include it in my report but thought that it might be of interest to the members of the section, particularly because of the relationship between vitamin C and the adrenal glands and the possibility that the amount of vitamin C in the blood may be some indication of the functional activity of the adrenal glands. I agree with Dr. Hopkins that there are many reasons for assuming a relationship between acne and the endocrine system. I should have made clear that the conclusions I presented today are based only on the studies and material of this report and are to be regarded as only one portion of the evidence which must be reviewed in making a final judgment of the cause of acne.

SMALLPOX VACCINATION OF INFANTS

REVACCINATIONS AFTER TWO TO THREE YEARS
IN CHILDREN PRIMARILY VACCINATED WITH
CULTURE VIRUS (RIVERS), COMPARED
WITH THOSE PRIMARILY VAC-
CINATED WITH CALF
LYMPH VIRUS

HARRY H. DONNALLY, M.D.

WASHINGTON, D. C.

Revaccinations of children from 2 to 3 years of age, among those who had been vaccinated¹ in 1935 and 1936 in the newborn nurseries of Gallinger Municipal Hospital within a few days of their birth, were done in June and July 1938. The total number of these revaccinated children followed through to involution of the skin reactions numbered seventy, almost exactly half of whom (thirty-six) had had successful primary takes at birth with culture vaccine virus (Rivers)

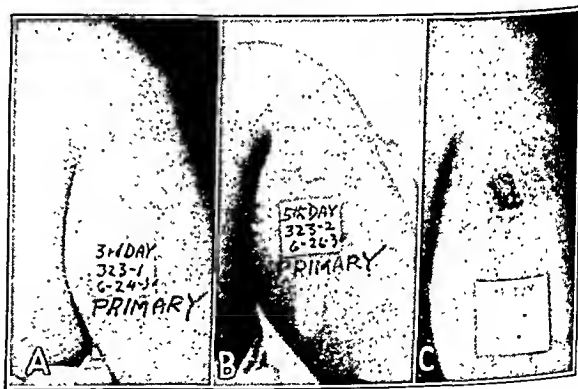


Fig. 1.—Primary vaccination when child was 3 hours old. Culture virus (Rivers) M60, intradermally; unsuccessful. June 22, 1938; no scar. Revaccination when child was 2 years 8 months old. New York calf lymph; thirty needle pressures cutaneously. Early appearance of skin reaction: Present within twenty hours. Rapidity of vaccine cycle: Not increased; eighth day at or near peak. Intensity of skin reaction: Large take. Estimate of immunity: None. A, third day; B, fifth day; C, eighth day.

inoculated intradermally, and the other half (thirty-four) had had successful takes at birth with calf lymph virus, two thirds (twenty-three) by the intradermal

From the Pediatric Department, George Washington University School of Medicine, and the Allergy Clinic of Children's Hospital. Read before the Section on Pediatrics at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939. Made possible in part by a grant from the National Research Council and a grant from Lederle Laboratories, Inc., Pearl River, N. Y. 1. Donnally, H. H.; Nicholson, M. M.; Anderson, W. S., and Grosvenor, M. H.: Intradermal Vaccination of Newborn with Culture Virus (Rivers) Compared with Intradermal Vaccination with Diluted Calf Lymph in Over 1,000 Babies, to be published.

method and the other third (eleven) by the cutaneous method (Leake's² multiple pressures). The skin reactions were essentially the same whether the intradermal vaccination had been performed with culture virus (Rivers) or diluted calf lymph virus (New York Bureau of Laboratories) but tended to appear earlier with calf lymph. Each of these viruses could give marked variation in intensity of skin reaction in different babies.

The scars of these primary takes were readily found because newborn infants were vaccinated uniformly on the outside of the left leg just below the head of the fibula. In the culture virus takes the scars were absent in 35.1 per cent and not over 5 mm. in diameter in 32.4 per cent, whereas in the primary calf lymph takes there were scars in excess of 10 mm. in diameter in 62 per cent, and no visible scar in one child (3 per cent). Intradermal inoculations of diluted calf lymph virus, 1 part in 100 of 0.85 per cent sodium chloride solution gave as a rule a smaller skin reaction and a smaller scar than the cutaneous multiple pressure. The percentage of successes was 93 per cent, the same whether the calf lymph was inoculated intradermally or cutaneously (table 1).

TABLE 1.—Size of Primary Scars

Virus Used in Primary Vaccination	Total Cases (71)	No Record of Scar	No Visible Scar	2 Mm. or Less	2 Plus 5 Mm.	5 Plus 10 Mm.	10 Plus 20 Mm.	Over 20 Mm.
Culture virus (Rivers) intradermal.....	37	3 (8.1%)	13 (35.1%)	6 (16.2%)	6 (16.2%)	6 (16.2%)	3 (8.1%)	0
Calf lymph virus	34	0	1 (3%)	0	4 (11.8%)	8 (23.5%)	11 (32.4%)	10 (29.4%)
Intradermal....	23	1	1	0	4	8	10	0
Cutaneous.....	11	0	0	0	0	0	1	10

Sizes of scars resulting from successful intradermal vaccinations with culture virus (Rivers) at birth, after two to three years: no scars in 35 per cent, and in the remainder small scars. Calf lymph virus scars resulting from successful intradermal or cutaneous vaccinations at birth, showed no scar in 3 per cent, and scars over 10 mm. in diameter in 62 per cent.

In a former publication³ in discussing the duration^{3a} of immunity to vaccination and to smallpox, the following statement occurs summarizing facts⁴ which relate to the subject: "Skin reaction to revaccination indicates

2. Leake, J. P.: Questions and Answers on Smallpox and Vaccination, Pub. Health Rep. 42: 221 (Jan. 28) 1927.
3. Donnally, H. H., and Nicholson, M. M.: A Study of Vaccination in Five Hundred Newborn Infants, J. A. M. A 103: 1269-1275 (Oct. 27) 1934.
3a. Rivers, Ward and Baird (Amount and Duration of Immunity Induced by Intradermal Inoculation of Cultured Vaccine Virus, J. Exper. Med. 69: 857 [June] 1939) state: "It is known that infants shortly after birth (Donnally, H. H., and Nicholson, Margaret M.: A Study of Vaccination in 500 Newborn Infants, J. A. M. A. 103: 1269 [Oct. 27] 1934) are somewhat resistant to infection with vaccine virus. Furthermore, it has been demonstrated (Donnally and Nicholson, loc. cit.) that such infants after a successful vaccination rapidly lose their immunity, many being fully susceptible a year later." Our conclusion was contrary to this. The completely immune are two and one-fourth times the number of nonimmune, as reported in 1934 for revaccinations of fifty-two infants from thirteen to sixteen months after successful vaccination at birth. Rivers, Ward and Baird state also that reports in the literature concerning the duration of immunity in children to vaccine virus are conflicting. This we have found to be true. Sergeant and Trens (De la perte d'immunité vaccinale, Bull. Acad. de méd., Paris 107: 625, 1932) state that the anti-smallpox vaccine prepared at the Institut Pasteur d'Algérie, which gives 100 per cent positive results with primary vaccinations on the newborn, gave the results presented below on persons previously successfully vaccinated and followed:

Age	Revaccinations	Reactions of the Primary Type	Percent of Reactions of the Primary Type
From 2 to 10 years	1,947	1,243	63%
From 11 to 20 years	946	539	56%

The detailed tables of these writers show that the proportion of successful revaccinations does not vary significantly from childhood to the age of 20 years.

4. Pirquet, Clemens: Klinische Studien über Vakzination und vakzinalle Allergie, Leipzig and Vienna, 1907.

the individual's degree of protection; in the early months following first vaccination he may be completely insusceptible; he may show varying alterations in skin reactivity, particularly after the first vaccination, the early appearance of these, the rapidity of the cycle, and the intensity of the skin reaction being indications of

TABLE 2.—Early Appearance of Skin Reactions

Virus Used in Primary Vaccination	Observed Later in Day and on Following Day	Total Number of Early Reactions
Culture virus (Rivers) intradermal.....	18	18 (100%)
Calf lymph virus.....	19	19 (100%)
Intradermal.....	13	13
Cutaneous.....	6	6
Primary takes with calf lymph in newborn, cutaneous.....	19	0
Incubation:	Two days 4 Three days 11 Four days 4	

Early appearance of skin reaction was present in all of the two groups, those primarily vaccinated with culture virus and those primarily vaccinated with calf lymph virus, the skin reaction appearing within twenty-four hours.

his state of immunity. The strength of smallpox protection is closely related to that of skin protection to revaccination; complete immunity or insusceptibility to revaccination is a temporary state." In each revaccination of the seventy children, a record was made when possible with regard to the early appearance, the rapidity of the vaccinal cycle and the intensity of the skin reaction. With these data an attempt was made to make an appraisal of the degree of immunity present in each of the children.

A control group of twelve children of similar age who had never been successfully vaccinated before were vaccinated in the same manner, at the same time and with the same batch of calf lymph virus.

VIRUS USED AND METHOD OF REVACCINATION

A fresh lot of calf lymph virus was obtained from the Bureau of Laboratories of the Department of Health of New York when we were ready to start the revaccinations. This was carefully protected in transit and while in our hands by keeping at low temperatures until actually used. Both groups, (1) the children

TABLE 3.—Rapidity of Vaccinal Cycle

Virus Used in Primary Vaccination	Total Cases (71)	Vaccinal Cycle Accelerated	Vaccinal Cycle Not Accelerated	Unknown
Culture virus (Rivers) intradermal....	37	17 (46%)	19 (51.4%)	1 (2.7%)
Calf lymph virus.....	34	29 (85.3%)	5 (14.7%)	0
Intradermal.....	23	19	4	
Cutaneous.....	11	10	1	

Children primarily successfully vaccinated intradermally at birth with culture virus (Rivers) showed on revaccination with calf lymph cutaneously after two to three years no acceleration of the vaccinal cycle in nineteen (51.4 per cent) of thirty-six revaccinations. Children primarily successfully vaccinated intradermally or cutaneously at birth with calf lymph virus showed on revaccination with calf lymph virus cutaneously after two to three years acceleration of the vaccinal cycle in twenty-nine (85.3 per cent) of thirty-four children.

primarily vaccinated with culture virus (Rivers) and (2) those primarily vaccinated with calf lymph virus (New York Bureau of Laboratories), either by multiple pressure and rubbing or by intradermal inoculation of diluted calf lymph, were revaccinated vigorously by thirty multiple pressures with the needle through

a drop of calf lymph on the skin, followed in each instance by moderate rubbing with the shaft of the needle and with the identical batch of virus. The plan was to use a "hot virus" and a severe technic of vaccination to insure uniformly a high percentage of takes. Thirty-eight revaccinated children were admitted

and the eighth day after and occasionally later. Records of the sizes of the papilla, redness, crusting, areola and adenopathy were also made.

EARLY APPEARANCE OF SKIN REACTIONS

In every instance among the children previously inoculated successfully with culture virus or with calf lymph virus, the skin reaction (table 2) appeared by

TABLE 5.—*Estimate of Immunity as Disclosed by Severe Cutaneous Revaccination*
(New York Bureau of Laboratories, calf lymph, thirty needle pressures cutaneously)

Virus Used in Primary Vaccination	No. of Cases (70)	Slight or None	Fair	Good	Immune Reaction
Culture virus (Rivers) intradermal.....	36	29 (80.5%)	5 (14%)	2 (5.5%)	0
Calf lymph virus.....	34	7 (20.6%)	2 (6%)	14 (41.2%)	11 (32.3%)
Intradermal.....	23	6	2	10	5
Cutaneous.....	11	1	0	4	6

Estimate of immunity: Among thirty-six children successfully vaccinated intradermally at birth with culture virus (Rivers), revaccination after two to three years with calf lymph virus cutaneously showed twenty-nine (80.5 per cent) to have apparently slight or no immunity and five (14 per cent) apparently to have fair and two (5.5 per cent) good immunity. Among thirty-four children successfully vaccinated intradermally or cutaneously at birth with calf lymph virus, revaccination after two to three years with calf lymph virus cutaneously showed seven (20.6 per cent) to have apparently slight or no immunity and 73.5 per cent apparently to have good immunity.

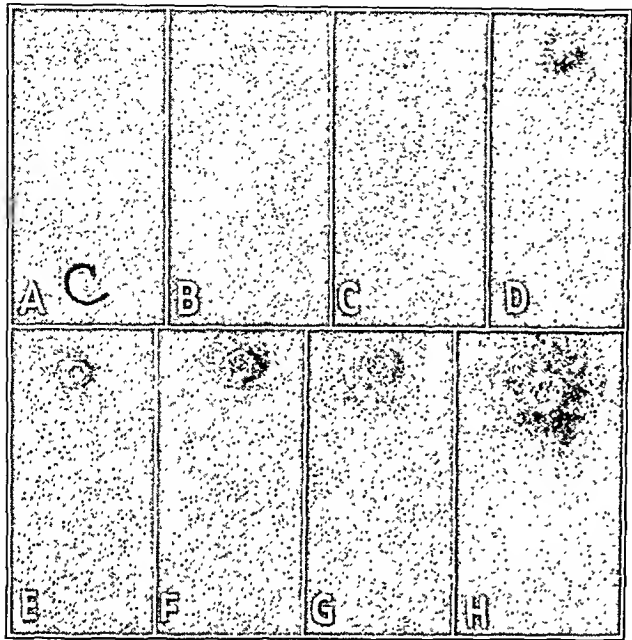


Fig. 2.—Primary vaccination when child was 23 hours old. Culture virus (Rivers) M54, intradermally; successful. Culture mediums unseeded as control. A, second day; B, third day; C, fourth day; D, fifth day; E, sixth day; F, seventh day; G, eighth day; H, ninth day.

immediately to the Children's Hospital, Washington, D. C., for observation during five days. Of the children admitted to the hospital, eighteen had been primarily inoculated successfully with culture virus,

the following day. In one child, unsuccessfully vaccinated at birth with culture virus, there was an identical early appearance of the skin reaction. The incubation period in nineteen consecutive newborn vaccinations were as follows: two days, four babies; three days, eleven babies; four days, four babies. This is an unsatisfactory control group because in the previous study³ it was emphasized that newborn infants were

TABLE 4.—*Intensity of Skin Reactions*

Virus Used in Primary Vaccination	No. of Cases (71)	Greater Than Primary	Similar to Primary	Less Than Primary	Unknown
Culture virus (Rivers) intradermal.....	37	34 (92%)	2 (5.4%)	0	1 (2.7%)
Calf lymph virus.....	34	5 (14.7%)	2 (6%)	27 (79.4%)	0
Intradermal.....	23	5	2	16	0
Cutaneous.....	11	0	0	11	0

Intensity of skin reaction on revaccination: Thirty-seven children successfully vaccinated at birth with culture virus (Rivers) intradermally showed on revaccination with calf lymph virus cutaneously greater intensity of skin reaction in thirty-four (92 per cent). Thirty-four children successfully vaccinated at birth with calf lymph virus intradermally or cutaneously showed on revaccination with calf lymph virus cutaneously greater intensity of skin reaction in five (14.7 per cent) and less intensity of skin reaction in twenty-seven (79.4 per cent).

nineteen successfully with calf lymph virus, and one unsuccessfully with culture virus. Their temperatures were taken regularly. The skin reaction was observed and recorded from three to five hours after inoculation, from eighteen to twenty hours after and from twenty-eight to thirty hours after. They were observed daily for the next three days during their stay in the Children's Hospital. They were then discharged as inpatients to report in the outpatient department until involution of the skin reaction. Photographs of the skin reactions were made in each child on the third day (forty-eight hours) after inoculation, the fifth day

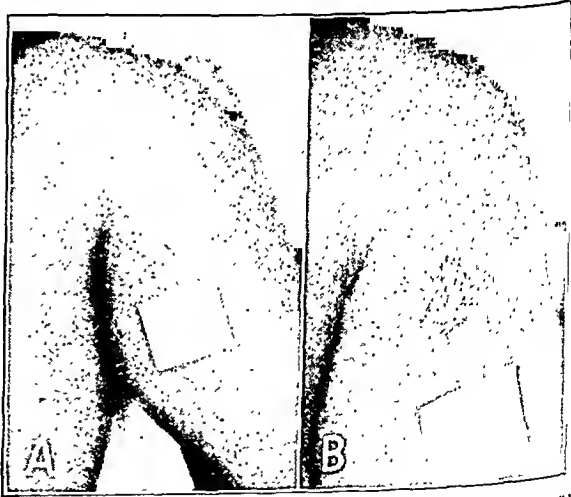


Fig. 3 (same child as in figure 2).—Primary vaccination when child was 23 hours old. Culture virus (Rivers) M54, intradermally; successful. June 22, 1938, size of sear 12 by 10 mm. slightly depressed. Revaccination when child was 2½ years old; thirty needle pressures cutaneously. Early appearance of skin reaction: Unknown. Rapidity of vaccinal cycle: Increased; eighth day involuting. Intensity of skin reaction: Large later, greater than primary. Estimate of immunity: Slight, if any. A, third day; B, eighth day.

successfully vaccinated somewhat less readily than children of 3 years. It is a common observation, however, among children primarily vaccinated at 3 years, that the skin reaction appears first on the third day or subsequently. No group of children of 3 years of age

vaccinated for the first time is available, followed as soon and as frequently after primary vaccination as necessary to use for controls. One may safely conclude that the early appearance of the skin reactions in 100 per cent of the thirty-eight children admitted to the Children's Hospital for an observation period of five

per cent (thirty-four children), similar to the primary in 5.4 per cent (two children) and unknown in one child (2.7 per cent) whose mother took him out of the city, and less than primary in no case. Among the children primarily vaccinated at birth with calf lymph virus either intradermally or cutaneously, the intensity of the skin reactions on revaccination was greater than the primary in 14.7 per cent (five children), similar to the primary in 6 per cent (two children) and less than the primary in 79.4 per cent (twenty-seven children).



Fig. 4.—Primary vaccination when child was 10 hours old. Culture virus (Rivers) M52, intradermally; lymph, thirty pressures cutaneously. Revaccination when child was 234 years old. New York calf lymph. June 29, 1938, no visible scar. Early appearance of skin reaction: Present within twenty hours. Rapidity of vaccinal cycle: Not increased; eighth day at or near peak. Intensity of skin reaction: Very large take; greater than primary. Estimate of immunity: None. A, fifth day; B, eighth day; C, fifteenth day; D, seventeenth day.

ESTIMATE OF IMMUNITY

An estimate of immunity (table 5) in each of the children revaccinated was made in four groups: (1) slight or none, (2) fair, (3) good and (4) immune reaction. In the slight or no immunity group were placed those children who on revaccination gave skin reactions which approximated the intensity of the

primary vaccinations among the twelve children who served as controls (fig. 1). Those primarily vaccinated with culture virus (fig. 2) were found to have slight or no immunity, as described, in 80.5 per cent (twenty-nine children) (figs. 3 and 4). In the calf lymph primary vaccinations there was slight or no immunity in 20.6 per cent (seven children). The children grouped as having "fair" immunity were those who showed beginning involution on the eighth day after revaccination. Among those primarily vaccinated with culture virus there were 14 per cent (five children) showing "fair" immunity, and among those primarily

RAPIDITY OF VACCINAL CYCLE

By following the skin reactions to vaccinia virus inoculations, through to involution, the rapidity of the vaccinal cycle (table 3) was observed. It was regarded as an accelerated cycle when involution made its appearance on or before the eighth day after revaccination. In primary vaccinal cycles the peak of the reaction may rarely sooner. Among culture virus cases in thirty-seven revaccinations the cycle was accelerated in 46 per cent (seventeen children) and not accelerated in 51.4 per cent (nineteen children). Among those primarily vaccinated with calf lymph virus the vaccinal cycle was accelerated in 85.3 per cent (twenty-nine children) and not accelerated in 14.7 per cent (five children).

INTENSITY OF SKIN REACTIONS

The intensity of skin reactions (table 4) to vaccinia virus seems to be a better index of probable immunity than both early appearance of skin reaction and accelerated vaccinal cycle. In recording the measurements and intensity of skin reactions in the revaccinations studied, observations were made and compared with the protocol of the skin reaction in the primary take which occurred shortly after birth. These reactions fell into three groups, in which the revaccination was greater than the primary, similar to the primary, and less than the primary. The intensity of skin reactions to revaccination as described in children primarily with culture virus was similar after than the primary in 92

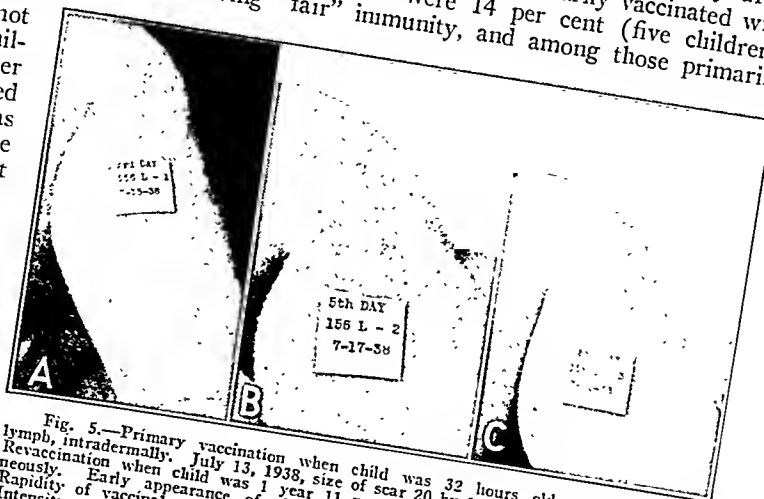


Fig. 5.—Primary vaccination when child was 32 hours old. New York calf lymph, intradermally. Revaccination when child was 1 year 11 months old. Thirty needle pressures cutaneously. Early appearance of skin reaction: Present within twenty-eight hours. Rapidity of vaccinal cycle: Increased; fifth day at peak; eighth day well involuted. Intensity of skin reaction: Less than that of primary vaccination. Estimate of immunity: Immune reaction. A, third day; B, fifth day; C, eighth day.

vaccinated with calf lymph virus "fair" immunity was found in 6 per cent (two children). "Good" immunity was estimated for those children who on revaccination had accelerated vaccinal cycles, considerably less intense skin reactions than the control group and than their

Dean Lewis⁹ stated his experience, which is that of many surgeons.

The changes occurring in a nerve fiber following a constriction and its removal, attended by a rapid return of function, have not been established. Clinical experience would seem to indicate that the conducting power of a nerve may be totally suspended for months and that within a few days following removal of the constricting band motor function may return. I have seen return of function in the extensors of the forearm within ten days following the removal of a very delicate constricting band which reduced the diameter of the musculospiral nerve by one half. The paralysis had been present for six months. Delicate scar tissue about a nerve in which there are no evidences of intraneural scar may cause the same suspension of function.

There may thus be changes in the muscles, fasciae or sheaths about nerve trunks which later may constrict them, even though they have escaped direct effects of the compression.

A report of five clinical cases follows.

REPORT OF CASES

CASE 1.—*Stumble while carrying heavy object. Sudden pain in leg and appearance of weakness of peroneal group of muscles in two hours. Partial reaction of degeneration.*

Stanley B., a white man aged 48, a truck driver, whose family history was irrelevant, was well until March 5, 1937, when he had an accident. He had had two previous accidents, in one of which his left leg was injured and in the other his back was strained, but neither seems to have any bearing on the present problem.

On March 5 at about 4:30 p. m., while he was carrying one end of a showcase through a doorway, he stumbled with his right foot and immediately felt a sharp pain in the leg (peroneal region) but continued with his work. His foot began to tingle but he drove his truck back to his place of business, reaching it at about 5:30 p. m. He went to his home and had to wait a short time for his supper; thus one and one-half to two hours had elapsed from the time of the accident. On arising to walk to his dining room he noticed that he could not raise his toes from the floor. He massaged the foot and leg with liniment and soaked the foot in a solution of magnesium sulfate.

On the following day he was unable to work because he could not tell when driving his car whether his foot was properly pressing on the brake or accelerator, and when I examined him eighteen days later he still had foot drop.

Examination showed the patient to be well nourished and in good general physical health except that he had considerable sclerosis of the arteries. His blood pressure was 140 systolic and 106 diastolic. The osseous system was normal. There was, as stated, foot drop on the right, and the right leg at the calf was slightly smaller in circumference than the left (the peroneal group a little smaller). Extension of the toes was weak but not so weak as flexion of the ankle. There was hypesthesia in the area of skin supplied by the common peroneal nerve. Otherwise results of the neurologic examination were entirely negative.

Electrical reactions showed loss of faradic irritability in the right peroneal group of muscles, but the cathodal closing was greater than the anodal closing contraction. There was thus a partial reaction of degeneration.

CASE 2.—*Patient fell 15 feet, alighting on his feet. Fracture of right os calcis but foot drop on the left. Examination after eleven months showed complete reaction of degeneration of common peroneal nerve.*

James W. T., a white man aged 52, a mechanic, was well until March 30, 1934, when, while working at his usual occupation of moving a safe, he lost his balance. Realizing that he was about to fall he leaped clear of obstructions and landed

on his feet on concrete 15 feet below. He had immediate severe pain in both feet and was unable to stand.

Taken to the hospital, he was examined by surgeons and the right os calcis was found fractured. The left foot was discolored and badly bruised but the bones were not fractured. The patient was hospitalized for only five days, and when he was allowed to go home foot drop was discovered on the left. He was confined to his home for five weeks and then he got about on crutches, resuming work in October.

When I saw him on Feb. 18, 1935, there was essentially nothing wrong with the patient except for foot drop on the left. There was no arteriosclerosis or other physical abnormality, and no predisposing cause for the foot drop could be found, but that condition was complete. The toes could not be raised. An area of anesthesia was found corresponding to the distribution of the common peroneal nerve. Electrical reactions showed complete absence of faradic and galvanic irritability, and there was atrophy of the peroneal group of muscles.

CASE 3.—*Healthy man suffered fall astride of plank and reached forward and upward with right hand to grasp support but failed to reach it. Usual signs of urethral injury but also paralysis of right serratus anterior muscle. Partial reaction of degeneration of long thoracic nerve.*

Isidor L., a man aged 37, Jewish, a laborer, with an irrelevant family and past personal history, was well and working at his usual occupation until March 10, 1930, when he suffered an accident. He was walking along a plank entering a new dwelling before an entrance had been constructed when he lost his balance and fell astride the plank. He reached forcefully forward and upward for support, which he failed to attain. However, he held to the plank with his legs and did not fall off it. He suffered for some hours with pain in his shoulder.

He was taken to a hospital because of the local injury and hematuria and remained there for three weeks. Weakness of the right shoulder appeared after some days, but as he remained in bed this gave him no particular trouble and he did not realize its seriousness. When he was discharged to return to work he was unable to do so.

When I saw him on May 21 he had been studied by several surgeons and the Wassermann reaction and roentgenograms of the shoulder had been examined, but no light had been thrown on the case from those points of view. Dr. Wallace Dodge believed the patient had a neuritis of the long thoracic nerve and referred him for possible reaction of degeneration.

There were the classic features of paralysis of the serratus anterior muscle on the right. At rest there was hardly any deformity, but when the arms were extended the angle of the right scapula projected far backward and the patient was unable to raise the arm well above the shoulder. The paralysis was so complete that one could with ease insert one's fingers between the scapula and the dorsal muscles and take hold of the scapula. This facilitated the test for reaction of degeneration because one could feel the contraction of the serratus anterior muscle when the nerve was stimulated. Other muscles were not involved.

The blood pressure was found to be 126 systolic and 85 diastolic. The pulse rate was 72 per minute and the arteries were in good condition. The heart and lungs were normal; in short, there was nothing of moment in the general physical examination, and the neurologic examination gave only the evidence incident to the paralysis of the serratus anterior muscle on the right. Some difficulty was encountered in attempting to stimulate the long thoracic nerve alone with the electric current. Because of a fairly good panniculus adiposus and good musculature in general the current tended to spread. However, after considerable effort success was obtained and stimulation with a small pole gave a contraction in the serratus anterior muscle alone. The cathodal closing contraction was found to be greater than the anodal closing, but no irritability at all to the faradic current was found.

At that time I was not acquainted with paralyzes occurring from such accidents and was inclined to believe that an independent neuritis had developed. For this reason the patient

⁹ Lewis, Dean: Some Peripheral Nerve Problems, Boston M. & S. J. 188: 975 (June 21) 1923.

sought another physician, who diagnosed, without knowledge of the details just described, a separation of the muscle from the scapula; he surgically fixed the scapula to the posterior thoracic wall.

CASE 4.—Sudden thrust of right arm upward during impending fall. Pain in region of right shoulder still present one month later. Gradual appearance of atrophy of right trapezius, spinati and rhomboid muscles. Diminished faradic irritability of right dorsalis scapular nerve.

Herbert R., a white man aged 55, a laborer, had had typhoid in 1902 and an appendectomy in 1924. He was referred to me on Aug. 29, 1936, because of pain in the region of the right shoulder dating from an accident July 21 of the same year. He gave a history of being perfectly well and working as usual packing cases in the warehouse of a soap factory when his left foot slipped forward. He threw his right arm upward over his head to balance himself and immediately felt a very sharp pain in the right shoulder joint. He became nauseated and vomited and was unable to continue work.

He was treated at his home for four days with massage and liniment before he returned to work. When he did return he continued to have the pain, which was worse at night. When the pain was severe he obtained some relief by placing his arm over his head. He was referred five weeks after the accident because of lack of improvement.

The patient was well nourished and in good general physical condition. The blood pressure was 164 systolic and 90 diastolic. The radial and brachial arteries were palpable but not materially sclerosed. The teeth were in poor condition. The essential changes were referable to the muscles of the right shoulder region. There was atrophy of the infraspinatus and supraspinatus, rhomboid and trapezius muscles, all on the right side only. There was a little winging of the right scapula, apparently from the weakness of the rhomboids and the trapezius. There was otherwise essentially no pathologic feature.

Electrical reactions showed reduction of faradic irritability of the right dorsal scapular nerve as compared with the left. The relations of the two types of galvanic reactions were normal.

CASE 5.—Slipping of foot from rung of ladder to ground. Pain, progressive paresthesia, followed by foot drop after fourteen hours, which increased for two days. Splinting of foot. Gradual recovery.

P. M. M., a white man aged 41, suffering from chronic but well compensated valvular disease of the heart, was referred by the state industrial accident commission because of dropping of the left foot. Except for "heart trouble" resulting from scarlet fever at the age of 8, tonsillitis at one time early in life and mild influenza during the World War, he had always been well and able to carry on his work as a carpenter.

On Nov. 22, 1938, he had a minor accident affecting the left foot. He was about to ascend a ladder with 30 pounds of shingles on his left shoulder and had placed his left foot on the first rung, when he turned at the sound of an automobile horn behind him. The distraction caused his foot to slip off the rung and strike the ground with some force, so that he immediately felt a sharp pain across the ball of the foot. However, he climbed up the ladder and continued with his work as usual for the one and a half hours of the day still remaining. The foot continued to pain him and swelling gradually appeared along the dorsal region of the transverse arch.

When the day's work was done he drove his own car home, and he slept as usual that night. When he arose the next morning he still had some pain in the ball of the foot, and numbness had appeared over the dorsum of the great toe and over the adjacent portion of the foot. The swelling of the dorsum of the foot had increased. As the patient attempted to walk he discovered that the toes of the injured foot tended to drag. Because of shortage of building materials there was no work for him to do on that day, so he remained at home and nursed the foot with hot fomentations and massage.

The second day following the accident was a holiday so he again remained at home. The foot drop was then found to

be complete and the numbness had extended half-way up the anterior surface of the leg. On the third day, as he was unable to carry on his work, which was then available, he consulted a physician, who found the foot drop complete and applied a cast. This was removed on the following day and a splint substituted to prevent stretching of the paralyzed muscles. Physical therapy was started, and the patient remained at home.

I saw the patient thirteen days after the injury. He stated that his foot was much improved, so that he could raise his toes slightly off the floor. He was a heavily built man weighing 218 pounds (99 Kg.) and was 70¾ inches (177 cm.) tall. Aside from a little lateral enlargement of the heart and a booming first sound, plus six badly infected teeth with surrounding pyorrhea, the left foot was the only element worthy of note in the physical examination. The patient was able to stand on the ball of either foot separately but was unable to raise the toes of the left foot when attempting to stand on his heels. There was hypesthesia to touch and pin prick on the dorsum of the foot and ankle, above which it gradually shaded off to normal. There was neither pain nor swelling in the tissues of the foot. Electrical reactions showed a slight diminution to faradic stimulation in producing dorsiflexion of the toes and foot. Otherwise conditions were normal.

A diagnosis was made of compression neuritis of the left common peroneal nerve, due to muscular action, in the stage of recovery.

This case seems unusually clear as one of the type here presented in that the paralysis progressed for two days after the injury in spite of rest. The paralysis seemed to begin fourteen hours after the accident and progress to completion in another twenty-four hours.

COMMENT

When it is recognized that muscular contractions, even a single forceful or unusual contraction, can thus after a latent period of hours or weeks give rise to functional paralysis of a nerve, there is danger of ascribing any obscure paralysis to some muscular action, especially if minute inquiry is made in every case. I would postulate that in a given case before paralysis is ascribed to muscular action certain conditions must be present: 1. There must have been some sort of sensory discomfort in the affected area at the time of the accident. 2. There must have been a recurrence or continuation of the discomfort for some hours or days. 3. The paralyzed nerve must be anatomically so situated that the muscles involved in the unusual strain compressed it in the act considered etiologic. 4. The paralysis must have appeared within, say, two months of the strain.

SUMMARY AND CONCLUSIONS

Attention is called to paralysis of peripheral nerves resulting from a single unusual muscular contraction and also to the delayed appearance of the paralysis.

As such paralysis may result from such action as a stumble, a sudden reaching forward or a sudden thrust of the hand upward for the purpose of regaining one's balance, the etiology is easily overlooked and in industrial work the industrial nature is often not conceded.

It is quite probable that more than one type of etiology may be concerned in such cases, e. g., intoxication, general anesthesia or chilling, but the muscular action with resultant contusion of the nerve is the exciting cause.

To avoid the danger of ascribing any obscure paralysis of a nerve to hypothetical muscular action I postulate that for a given case to be valid as belonging to this group there must have been (1) some sort of sensory discomfort in the affected area at the time of the injury, (2) continuance or recurrence of the

discomfort for hours or days, (3) possibility of compression of the affected nerve by the muscular contraction assumed responsible, and (4) appearance of paralysis within, say, two months of the strain.

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ABSTRACT OF DISCUSSION

DR. L. J. POLLOCK, Chicago: Lesions of the peripheral nerves are rare in civil life as compared with those that we saw in the war, and lesions of the peripheral nerves that occur as a result of indirect trauma are still rarer, and those that occur some time after trauma are rare indeed. One of the causes of a lesion of a peripheral nerve is a sudden, strong contraction of a muscle. Such a contraction could be the result of stretching such as would occur if you were falling off a ladder and you suddenly reached for a rung. Even if you do not grasp the rung of the ladder, you have produced a stretching. Another type is that which is produced by dislocation of a nerve, which might occur in an ulnar nerve resting in a rather shallow groove of the olecranon, where a contraction of the triceps might produce dislocation of the ulnar nerve, or you may produce a compression against a sharp edge of a muscle, just as Dr. Nielsen reported where the long thoracic nerve was compressed by the scalenus muscle, or at times the pronator teres may be compressed against the median nerve. If a nerve is injured by compression or by stretching or contusion, the effect on the nerve is immediate. If you ligate a nerve or if you bruise a nerve there is an immediate loss of function of that nerve of varying degree; therefore I think that in these instances of indirect trauma to nerves in which the symptoms occur some time after the injury we must consider the possibility of some other intermediate action whatever it might be. Among them are hemorrhages. There may be some inflammatory reaction of tissue adjacent to the nerve. Finally, one must give thought to the hypothetical consideration of what are known as the instances of traumatic mononeuritis, in which case they usually occur after some time, the bridging period of course also being held to some hypothetical reasonable duration where, under the condition of cachexia, chronic infection, chronic alcoholism or diabetes, a nerve that is what we would ordinarily consider mildly injured might then become the site of a mononeuritis. I am dubious as to the occurrence of such a condition. There is another circumstance that is apparent from these cases. The first patient noted a foot drop one and one-half hours after injury. The second patient landed on his feet and fractured the os calcis of one leg. He was put to bed, I take it, and on the fifth day it was noted that he had a foot drop on the left side. I have had that experience numbers of times, but does it mean that the foot drop occurred on the fifth day, and I should like to know whether they actually in examining the patient said that the foot drop was not present on the first day. A patient may come to us and have noted, for example, that he had a marked atrophy and the atrophy was progressive but the paralysis was immediate and perhaps not noted. I would conclude from this study that this is a rare group of cases to which our attention should be called, but we should be careful in evaluating the interval between the time of injury and the actual onset of loss of function and not the time when it is noted by the patient or some one else that some loss of function has occurred.

DR. R. B. RANEY, Los Angeles: From a surgical point of view, the conditions seen at operation in cases of nerve injury are almost too well known to be worthy of mention. However, cases are occasionally seen in which the paralysis appears later and extreme changes in the structure are observed at operation. I have had the opportunity of seeing only one such case, and changes had occurred not only in the overlying muscle but also in the nerve roots. This was the case of a 20 year old girl who had suffered an injury to the right brachial plexus. In attempting to avoid injury to her face from a breaking windshield during the automobile accident she turned her head sharply to the right, and the sudden stop of the car snapped her neck. She suffered at the time pain in the shoulder, arm and hand. There was some numbness and local tenderness, which largely disappeared in a few weeks. As far as neurologic signs following the injury were concerned, they were not definitely established since a neurologic examination had not been done. About

five weeks after the injury, pain and impaired motor function of the affected arm reappeared. Examination several months later showed involvement of almost the entire brachial plexus; impaired sensation and motor weakness were striking. Exploration revealed the scalenus anticus muscle largely replaced by fibrous tissue, adherent to the roots of the plexus. The scalenus anticus muscle was removed, showing the roots of the plexus extremely flattened. Recovery of function was remarkable but not complete. This case illustrates the profound changes in perineural structures and the delayed paralysis that can occur from a single muscular contraction with, of course in this case, other factors playing a part. Therefore it is not only conceivable but reasonable to assume that less severe muscular contractions can cause local injury to the perineural structures. Finally, secondary injury to the nerves themselves by contraction of fibrous tissue seems decidedly reasonable.

DR. PERCIVAL BAILEY, Chicago: I should like to ask Dr. Nielsen whether he had a reason for choosing two months as the upper limit or whether he was merely guided by the principle that the longer the time elapsed the less probable would be the causal association and thought merely that after two months it probably would be too slight to consider.

DR. J. M. NIELSEN, Los Angeles: As to the onset of the paralysis, I cannot say because I did not see the patient until some time afterward, but the records of the hospital in which the patient was placed gave the usual results of physical examination as made by the physician at the time and the usual visits without any mention of any paralysis. As to Dr. Bailey's question, I am guided by the improbability of things developing later, and I have tried to state the reasons for this more accurately in the paper. I have taken the attitude that something should be evident within two months. Weakness may develop as it did in some cases and continue to develop for many months, but there should be some indication before the end of the two months.

THE USE OF COLLOIDAL CALOMEL OINTMENT IN DERMATOLOGY

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Mercury ointments in various forms have long been a standby for the dermatologist. First, metallic mercury ointments were employed, and in recent times the ammoniated mercury ointment has enjoyed tremendous vogue. In the last few years, calomel ointment has been used in the so-called clean inunction method in the treatment of syphilis.

Calomel ointment, first prepared in France during the last century, contained 10 per cent of calomel in petrolatum. The British used 20 per cent of calomel in lard. A 30 per cent ointment with white petrolatum was introduced into the National Formulary V (1926) under the name of Ointment of Mild Mercurous Chloride. In N. F. VI (1936) the base was changed to equal parts of white petrolatum and hydrous wool fat.

Dr. Lewis C. Britt,¹ chemist of the Oregon State Board of Pharmacy, first pointed out that the N. F. VI ointment gave a narrower inhibitory ring in the agar plate test for antiseptics than did the N. F. V ointment.

Mr. E. E. Vicher² at the University of Illinois College of Pharmacy undertook the study of the ointment.

Assisted by a grant from the American Pharmaceutical Association, From the University of Illinois College of Medicine (Dr. Cornbleet) and Rush Medical College (Dr. Slepian and Dr. Ebert).
1. Britt, L. C.: The Antiseptic Value of Calomel Ointment N. F. V. and N. F. VI, J. Am. Pharm. A. 26: 646-647 (July) 1937.
2. Vicher, E. E.; Snyder, R. K., and Gathercoal, E. N.: An Improved Calomel Ointment, J. Am. Pharm. A. 26: 1241-1245 (Dec.) 1937.

He developed calomel in which the particles were very small, 0.5 micron or less in diameter. This calomel in aqueous suspension with gelatin was incorporated into the ointment base. The new calomel ointment produced an inhibitory ring from three to six times as broad as did the official calomel ointment.

The improved or "colloidal" calomel ointment has been extensively investigated from the chemical, bactericidal, pharmacologic and toxicologic standpoints. It appears to be no more toxic than the N. F. ointment, which has never been considered as toxic for human beings in doses of 1 drachm (4 Gm.). It has a prophylactic value in syphilis at least equal to that of the N. F. VI ointment.

As it is not unreasonable to expect that a colloidal calomel application with its demonstrated efficiency as a superior bactericidal agent should find use in certain cutaneous disorders, this colloidal calomel ointment has been used in the dispensary of the dermatologic clinics of the Cook County Hospital to a sufficient extent to justify a preliminary report.

USE IN IMPETIGO CONTAGIOSA

We have found its greatest therapeutic value to be in impetigo contagiosa. In about 130 cases of this infection colloidal calomel ointment has served as an extremely efficient remedy. The use of ammoniated mercury ointment has long been a standard agent in impetigo, but all experienced dermatologists attest the observation that for some reason this medicament is not as efficient as it was in the past. According to our observations, colloidal calomel ointment clears the eruption in an average of one third to one half the time required by ointments of ammoniated mercury (chart). This is particularly gratifying since the colloidal calomel ointment is both cleanly and, so far as our experience goes, not toxic. In not more than three or four instances it has produced a slight irritation, but this was not great enough to necessitate its withdrawal. Its cleanliness is to be emphasized because it gains the patient's cooperation and makes it a favorite over other efficient agents, such as applications of gentian violet solution.

Colloidal calomel ointment was found useful in other superficial pyodermas in addition to impetigo. In ecthyma, the base of the lesion is so deep as to require removal of the overlying crust, whereupon the colloidal calomel ointment proves curative. In Bockhart's impetigo, which is a more superficial infection of the hair follicles than that in furunculosis, and in furunculosis itself, no benefit was obtained from the use of colloidal calomel ointment.

ERYTHEMATOUS DERMATITIS BEHIND EAR

There is a condition which produces a superficial erythematous dermatitis in the fold behind the ear which is diagnosed most often as seborrheic dermatitis and which some authorities think is due to a streptococcal infection. This is particularly resistant to treatment and especially so in that form in which the disease process reaches around to the front of the ear. In several cases of this disorder, the use of colloidal calomel ointment has been of benefit. It has been more effective than any other agent we have used.

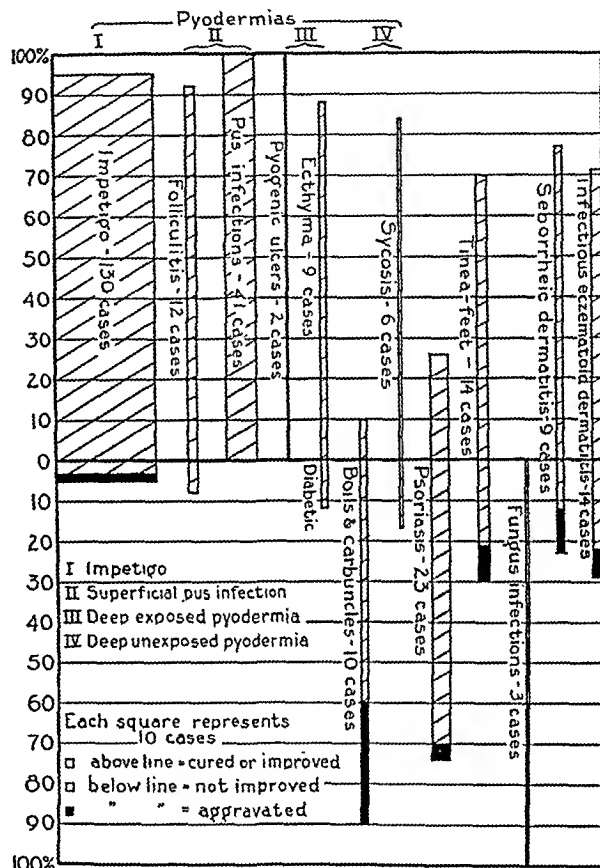
INFECTED LEG ULCERS

Three patients with leg ulcers which, by their appearance, were undoubtedly continued or aggravated by secondary pyogenic infection, received much benefit

from applications of colloidal calomel ointment. With no other treatment than the usual advice to the patient to remain off his feet as much as possible, these ulcers healed. In a number of other instances of leg ulcers on a basis of poor circulation, these applications were of no benefit.

OTHER DERMATOSES

Several patients with early psoriasis were benefited by applications of colloidal calomel ointment. It must be emphasized that these early cases are as a rule easily improved by ammoniated mercury ointment and that improvement with the calomel ointment represents no great triumph. In older cases of psoriasis and in the inveterate ones, colloidal calomel ointment did not improve the lesions.



Dermatoses treated with colloidal calomel ointment.

Since colloidal calomel ointment proved to be so efficient in some of the superficial infections, it was hoped that it might likewise be beneficial in the superficial fungous infections such as eczematoid ringworm. Unfortunately, colloidal calomel ointment did not influence these infections.

There is a relatively superficial, sharply defined, exudative, patchy dermatitis that occurs on the backs of the hands and forearms particularly, but which may appear elsewhere also, called infectious eczematoid dermatitis. This probably results from the secondary infection of an already irritated base. Several of these cases were improved by applications of colloidal calomel ointment. Two of them were irritated by this form of treatment, so that it had to be stopped.

A number of other dermatoses were treated with the colloidal calomel ointment more or less unsuccessfully.

There is no benefit from its use in lichen planus, paronychia due to yeast infections, pityriasis rosea, tinea circinata, lupus erythematosus or lupus vulgaris.

SUMMARY

Colloidal calomel ointment in this study was found to be a clean, unusually effective agent in impetigo contagiosa and related superficial pyodermas. Seborrhic eczema behind the ears, which is often quite resistant to treatment, was favorably influenced by applications of colloidal calomel ointment. It improved leg ulcers aggravated or continued by a secondary pyogenic infection; also some forms of seborrhic eczema and early cases of psoriasis. In other dermatoses, colloidal calomel ointment either was without benefit or proved to be irritating.

Clinical Notes, Suggestions and New Instruments

EIGHT YEARS DEPENDENCE ON A RESPIRATOR AN UNUSUAL CASE OF POLIOMYELITIS

SCOTT LORD SMITH, M.D., POUGHKEEPSIE, N. Y.

Seven years dependence on a respirator is an experience sufficiently unusual to warrant chronicle and comment. When the cause of such dependence is a case of acute anterior poliomyelitis with resultant massive paralysis involving practically all voluntary muscles below the clavicles and all automatic respiratory muscles with the exception of the right leaf of the diaphragm, the number and magnitude of the problems presented are all too evident. In these seven years the subject of this report spent more than half his time in the respirator, never acquiring a capacity to sleep and carry on respiration simultaneously. During this time three types of problems arose: (1) those immediately connected with his care, (2) those concerned with the physiologic changes occurring as a result of the extensive paralysis and (3) those involved in a study of his respiratory control. The first two of these problems will be discussed in this paper; the third is now under investigation. In order to show what problems arose in dealing with the acute illness, the maintenance of body function, the treatment of upper respiratory infection and pneumonia in one who could not cough, and the preservation of function of the few unimpaired muscles, a brief summary of the condition of the boy on admission to the hospital in September 1931 and at the end of each subsequent year will be given.

B. S., a boy aged 13 years, was admitted to the Medical Service of Vassar Brothers Hospital on the fifth day of an acute illness. A diagnosis of poliomyelitis was confirmed by a high cell count of the spinal fluid, and 60 cc. of immune serum was given at once intramuscularly. The patient was exceptionally well nourished and developed and was not at that time in immediate respiratory distress, although his extremely labored breathing was short, shallow, rapid and confined entirely to the diaphragm. The intercostal muscles did not move at all. The temperature was 103 F., the pulse rate 110 and the respiratory rate 30. The pupils were equal and contracted, reacting sluggishly to light. There was no paralysis of the ocular or facial muscles. There was no trouble in swallowing. The heart was rapid and regular except for an occasionally missed beat. The sounds were clear and without murmurs. The lungs were clear and the abdomen was normal except for the exaggeration of abdominal respiration. There was complete paralysis of all four extremities, the patient being able to move only the toes of both feet and to make slight motions with the left hand and forearm. The cutaneous reflexes were absent.

During the interval between the preparation of this report and its publication, the patient has completed his eighth year, with dependence on the respirator, without material changes over the preceding year. The studies on metabolic changes referred to in the first paragraph and made in collaboration with Prof. Elizabeth Magers, of the physiology Department of Vassar College, will shortly be published elsewhere.

Twelve hours after admission, increasing dyspnea and cyanosis demanded the use of the respirator and on the second day catheterization became necessary. As extreme cyanosis occurred within thirty seconds after the respirator was opened a team of four persons was required, a doctor to do artificial respiration, another to catheterize, a nurse to change the sheets and another to rub the back. Even with all four working simultaneously and at top speed, from three and a half to four minutes was necessary and the boy approached asphyxiation and unconsciousness.

For two days the temperature fell. It then rose to 108 F. and again dropped rapidly, ceasing to be significant. Persistent muscle twitching of the face, neck and left leg was troublesome from the first and continued during four weeks in all four extremities. This necessitated frequent sedatives. There was also extreme difficulty in establishing intestinal action, and for two or three days a paralytic ileus seemed about to occur. Gradually, however, the combined use of cathartics and enemas was successful. Poor appetite required feeding by tube. But after a few months the body became adjusted, the gastrointestinal tract resumed its normal functioning, appetite returned and ability to breathe improved. After seven months of paralysis a general upturn in physical condition was observable. Gradually the use of the auxiliary muscles, semivoluntary in character, made it possible for the patient to spend more and more time out of the machine. The only lessening of the paralysis, however, was in the wrist and finger of the left hand, in one finger of the right hand and in the flexor muscle of the left thigh. Movement was possible in these muscles only when the boy was in the bath.

In September 1932 the child could remain out of the respirator for eight or nine hours without undue fatigue. Fluoroscopic examination showed a right diaphragm with an excursion estimated at 2 cm. and a negative action of the left diaphragm. No motion of the intercostal muscles could be detected. The auxiliary respiratory muscles, especially of the scalenus group on the right side, seemed to have developed a semiautomatic action. Outside the respirator he was never able to sleep and could eat but little without experiencing a sense of fullness. There had been no changes in the affected muscles. His weight, which in the spring had been 73 pounds (33 Kg.), had increased to 92 pounds (42 Kg.). His general condition was good, his spirits were excellent. He enjoyed a daily tub bath, made trips about the hospital in a wheel chair and played several games adapted to his capabilities.

The second year was one of ups and downs. Dr. Drinker felt that it was important for the boy to regain self confidence and therefore advised that he be forced to discontinue sleeping in the machine. It was hoped that fatigue would eventually induce natural sleep. On one occasion he was kept out of the respirator for two and one half days until complete exhaustion forced a return to artificial respiration. Later we tried for several weeks having him remain outside part of every second night, but as there were progressive loss of weight, increased irritability and digestive upsets we abandoned attempts to force normal respiration during sleep. During most of this year he lost weight. In March and June there were periods of fever and infection of the upper respiratory tract, which were difficult to relieve and painful. Continuous artificial respiration, aspiration of secretions from the nasopharynx, morphine and ammonium chloride were found helpful.

On the afternoon of June 16, 1933, without warning of any kind, the slowly built-up ability to breathe with the auxiliary muscles, especially with the right scalenus group, suddenly ceased. Complaining of a lump in the chest, he became suddenly cyanotic. In the respirator he rapidly regained color and comfort. Examination showed that the voluntary auxiliary muscles of respiration, the contractions of which with each respiration had been visible a few hours earlier, had ceased to work on the right side, where they had been the strongest. Two weeks later muscular ability had again been built up and for an hour at a time he was able to breathe comfortably. In a month he could breathe alone for twelve hours. The left scalenus muscle group developed and soon exceeded the right ones in strength. This condition has continued.

In the early part of the third year the lost weight was regained. Thereafter, although there was no change in respira-

tory function he did well on his regular routine and was in good spirits. In a station wagon which carried his wheel chair he took many rides about the country and often went to the movies. Being away from the respirator gave him no apprehension, and he was able to eat well outside. Hay fever and eczema, however, caused considerable distress. Increase in alkalinity of the urine was accompanied by frequency and discomfort, which was readily relieved by the administration of ammonium chloride. Occasional hematuria accompanied by vesical irritation appeared for the first time.

During the year 1935 he continued to show symptoms of kidney stone, acute pain in the right lumbar region, hematuria, nausea and the passage of small "gravel" by the urethra. In April he had pneumonia, with consolidation in the left lower lobe. For nearly two weeks there was irregular fever up to 104 F., pain in the left side of the chest, and choking. Relief from thick mucus which he could not loosen was obtained by aspiration with a suction pump, oxygen being given with a nasal catheter. Gradually he made a complete recovery.

The fifth year was an uneventful one. An x-ray examination showed the presence of a stone in the right kidney pelvis. Two months later stones appeared in the left kidney pelvis and low down in the left ureter. Sex development was average for his age.

In 1937 the chief changes were psychologic. In general he lost confidence in himself and was fearful of being at a distance from the respirator, so that he gave up his frequent trips. He lost his former belief in his eventual recovery and in the value of living. He maintained, however, his interest in all athletic contests, in cross-word puzzles and in cards, checkers and chess.

The seventh year was without new development. The loss of morale, begun in the previous year, continued and increased. Through most of 1938 he did not leave the hospital grounds. There was increasing pain and hematuria from the renal calculi, which were seen by means of the x-rays to be increasing in size. For three months approximately 85,000 units of vitamin A was given daily. As the calculi had not decreased in size at the end of this period, this therapy was discontinued.

GENERAL PROBLEMS

Later in the fall of 1938, signs of eye strain became apparent. Glasses with a 3 degree prism base up, in addition to ordinary correction, raised the field of vision one foot nearer to the plane of direct vision. This procedure not only had the desired effect on his vision but caused a more important uplift of his general morale.

Deformities came on late and insidiously. A tendency to a lateral curvature of the spine became apparent when he first began to use a wheel chair in 1932, even though the shoulders were elevated only a few inches in order to give him an opportunity to look around. Sand bags and other means of correction proved ineffectual and uncomfortable and were abandoned. The resulting curvature has slowly increased in the last two years. Contractures of both hands appeared considerably later and became stationary.

Constant twenty-four hour nursing attention was maintained from the first and we were unable to find any way to dispense with it or even to combine the care of this boy with that of others. All changes in position of the body from the shoulders down had to be made by the nurse, and all parts exposed to pressure were kept cushioned with rings. As a means of maintaining a healthy condition of the skin the daily bath was begun as soon as respiratory function permitted. The old style portable typhoid tub served this purpose admirably. In addition the nurse had to feed him each mouthful; she also turned each page of the books he read and made the moves he indicated in playing games. She remained constantly within earshot, because we were unable to arrange a call system, and speech for him was possible only during one phase of the respirator action. Nursing care was exceeded in importance only by mechanical respiration.

The original respirator has been in service during the entire seven years, except for a period of two months when the motor blower exhaust was being replaced by bellows. These are much quieter and have the additional advantage of being operable by hand in an emergency. As fuses had blown out several times

when continuous operation was necessary, the manual operation was reassuring to the patient and his attendants although its use has never been required.

SUMMARY

At the time this is being written the subject of this report, a youth nearly 21 years of age and a victim of the 1931 poliomyelitis epidemic, has been dependent on a respirator, at least during sleep, for over seven years. He has been through the vicissitudes of colds, hay fever, eczema and pneumonia. He is still troubled by renal calculi, a continuously developing spinal curvature, and occasional mental depression. The nearly complete paralysis has given opportunity to study some of the concomitant metabolic changes.

SULFAPYRIDINE IN TRACHOMA

M. P. SPEARMAN, M.D., AND W. E. VANDEVERE, M.D.
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To the growing list of diseases in which sulfapyridine may be found of use we should like to add trachoma. In two cases, herewith reported, we have observed astonishing improvement in the chronic form of the disease when treated with sulfapyridine.

REPORT OF CASES

CASE 1.—F. F., a white youth aged 15, first seen by us March 11, 1939, had been under treatment for trachoma elsewhere for about one year. Examination showed both corneas markedly opaque. There were no clear areas on either cornea. Vision in both eyes was fingers at 1 foot. Pannus was markedly developed on both corneas. The under surfaces of both upper lids were covered with follicles. The Wassermann and Kahn reactions of the blood were negative. The patient was hospitalized and massive doses of sulfanilamide were given. During the period of hospitalization, covering one month, about 1,000 grains (65 Gm.) of sulfanilamide was given. Local treatment with ophthalmic ointments, copper citrate and quinine bisulfate was given. At the end of one month the patient was discharged from the hospital only slightly improved. The patient went home, where he used only local treatment, consisting of ophthalmic ointment quinine bisulfate twice a day. On July 24 he was again seen at our office. No improvement was noted. At that time we prescribed sulfapyridine, $7\frac{1}{2}$ grains (0.5 Gm.) every four hours. August 5 we again examined the patient. The lower half of each cornea was found to be free from pannus and was completely transparent. The vision was 20/50 in both eyes. The under surfaces of the lids were smooth and free from irritation. The patient was told to continue the same dosage of sulfapyridine. August 26 we last saw the patient. At this time both corneas were almost completely transparent and all signs of pannus had disappeared. Vision was 20/30 in the right eye and 20/40 in the left eye (without glasses). There have been no toxic reactions to the sulfapyridine.

CASE 2.—G. U., a white man aged 49, admitted to our outpatient service at a local hospital Aug. 11, 1939, had been treated for trachoma for about five years. The Wassermann and Kahn reactions of the blood were negative. Every conceivable anti-septic had been used in the eyes. Two years before admission bilateral tarsectomy was done on the upper eyelids. Some months later a plastic procedure was performed for "entropion." Certain of the organic silver preparations had been abundantly used as instillations in the eyes, so that there was on admission a definite argyrosis of the bulbar and palpebral conjunctivas. Examination on admission showed marked opacity of both corneas, well developed pannus and deep scarring of the under surfaces of the upper lids but no trichiasis. Vision was fingers at 6 feet in both eyes. August 23 we prescribed sulfapyridine $7\frac{1}{2}$ grains every four hours. Examination of the eyes August 30 showed both corneas beginning to clear and the pannus lessening. September 6 the lower half of each cornea was becoming transparent; the upper portions were much less opaque, with tiny, scattered areas of transparency. The pannus had nearly disappeared in both eyes. Vision was 20/100 in both eyes.

COMMENT

While realizing that adequate conclusions cannot be drawn from clinical results obtained in only two cases, we nevertheless were greatly impressed with the remarkable remissions of pathologic signs obtained in two cases of chronic trachoma when sulfapyridine was given. Both cases had proved intractable to all other methods of treatment. Vision has improved greatly in both cases. We plan to continue our present treatment at least until maximum improvement, both subjectively and objectively, is obtained.

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CONTACT DERMATITIS DUE TO MANGO

SAMUEL J. ZAKON, M.D., CHICAGO

CASE 1.—A 29 year old woman presented an acute vesicular dermatitis of three days' duration which involved both lips and a moderately large circumoral area. There was no history of contact with any of the common substances usually responsible for a dermatitis in this location. She stated that two days prior to the onset she received a case of mangoes from her father, who owns a fruit farm in Florida. About twenty-four hours after eating a mango itching developed about her mouth, and her lips began to swell.

Examination revealed an erythematovesicular eruption involving both lips, the chin and both cheeks. The lips were edematous and she had difficulty in opening the mouth. There were no lesions on the mucous membranes of the mouth. The patient stated that she felt nauseated after eating the mangoes. Her past history is irrelevant with the exception that she had had attacks of urticaria after the ingestion of strawberries.

Patch tests performed on the patient's back using mango peel and juice proved that only the peel produced a positive reaction.

CASE 2.—A 19 year old girl presented an acute erythematovesicular eruption of twenty-four hours' duration on the lips, nose, face and neck. There were extreme burning and itching. The patient felt nauseated and complained of a moderate headache. There was no history of contact with any of the materials usually suspected when an eruption involves this area, such as cosmetics, mouth washes or tooth pastes. There was a history of eating a mango twenty-four hours before the onset of the eruption. Other members of the same family who ate mangoes were unaffected.

Examination revealed marked edema about the lips and a dull red erythema studded with discrete vesicles and bullae about the face. The previous history is essentially irrelevant with the exception that six months prior to this attack a dermatitis which was due to dress shields developed in the axillae.

Patch tests with the peel and juice of the fruit produced a positive reaction to the peel and not the juice.

In both cases the condition cleared up within ten days with mild local therapy.

COMMENT

The fruit of the mango has recently become popular as a delicacy in many parts of the United States. According to Kirby-Smith,¹ the peel before ripening contains a substance which affords protection from the attacks of insects. This substance remains so active in some varieties, even after the fruit has ripened, as to affect some people eating the fruit with what is known as "mango poisoning."

The mango belongs to the species *Mangifera indica*. Its home is believed to be India, Burma and Malaya and it is known as the "apple of the tropics." The fruit varies from oval to S shape, weighing from 8 to 38 ounces. It has a relatively smooth peel with a single large seed and when ripe is usually greenish yellow.

Mango dermatitis as defined by Kirby-Smith¹ is an irritation of the skin and mucous membranes produced in susceptible

persons by contact with the resin from the peeling or stem of the fruit or with the sap of the tree. The sites usually affected are the lips, face and hands. Depending on the susceptibility of the individual and the amount of exposure, the lesions vary from mild dermatitis to severe disfiguring edema and even to prostration.

The mango and the poison ivy both belong to the family Anacardiaceae. The dermatitis caused by eating the mango fruit may be compared to that of *Rhus venenata*.

CONCLUSIONS

An acute vesicular or bullous dermatitis and marked edema about the mouth may be caused by eating mango fruit. With the increasing use of this fruit in the daily diet, the mango should be seriously considered as an etiologic factor in acute dermatitis of the face.

185 North Wabash Avenue.

Special Clinical Article

THE TREATMENT OF THE PATIENT
WITH SEVERE BURNS

CLINICAL LECTURE AT ST. LOUIS SESSION

ROY D. McCLURE, M.D.

DETROIT

In 1937 there were almost 8,000 deaths from fire in the United States. Forty-five per cent of lethal burns are in children under 6 years of age, and in Penberthy's¹ series of 493 cases at the Children's Hospital in Detroit it was found that 80 per cent of these should be considered avoidable. We, as physicians, should take a prominent part in a program of safety education directed toward preventing this needless loss of life.

It is now fifteen years since Davidson² began his revolutionary work on burns while he was resident surgeon at the Henry Ford Hospital. This period marked the inception of a method of treatment which many of us believe is the best available at the present time, but more significant was the sudden arousal of interest in the subject of burns among physicians throughout this country and abroad. The number of papers on burns during the ten year period following his original communication was three times that of the preceding ten year period. Many variations in the treatment have been promulgated which, in the hands of their sponsors, show results comparable with the best that prevail today. These variations should not be allowed to confuse the average physician, who in the aggregate cares for the great mass of all burn cases, from meticulous attention to the essential principles of treatment, which I shall attempt to outline.

In view of the careful clinical and experimental work that has been done recently, it is desirable to pause and take stock of the present available information. Answers to the following questions should be sought:

1. Are there any new facts concerning the systemic effects of the chemical and tissue changes which follow severe burns?

From the Department of Surgery of the Henry Ford Hospital. The author acknowledges the assistance of Dr. C. R. Lam in the preparation of this paper.

Read in the Surgical Division of the General Scientific Meetings at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

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2. What is the effect on the mortality rate of present methods of treatment?

3. In the light of our present knowledge, what is the best therapeutic procedure in burns?

Research on burns has been largely concentrated on explaining the so-called toxic phase, which appears after eighteen to twenty-four hours. Three theories have arisen:

1. First is the physical, which assumes that there is local leakage of fluids and plasma proteins, with resulting blood concentration and circulatory failure. This has been shown by Underhill,³ Blalock,⁴ and Harkins.⁵ At the 1937 session of the French Surgical Congress, where Allen and I⁶ reported the experience with tannic acid in this country, the trend was markedly toward the theory of a soluble toxin. All agree on the importance of loss of plasma protein, but it is probably not the lethal factor.

At this time I shall mention the possible role of tissue anoxia in burns. Underhill stated: "Marked concentration of blood means a failing circulation, an inefficient oxygen carrier, oxygen starvation of tissues, fall of temperature, and finally suspension of vital processes." This statement is interesting in view of the recent advances in the knowledge of anoxic lesions produced by barbiturate poisoning, acute alcoholism, anesthetics and other factors, as exemplified by the recent work of Hartman⁷ of our staff.

2. Then there is the bacterial theory of Aldrich.⁸ At the Johns Hopkins Hospital he took cultures of a large series of burns, and at the end of eighteen hours he found beta hemolytic streptococci in most of them and invariably found these organisms in the blood and burned areas in fatal cases. Aldrich remains the chief proponent of the theory, stating in 1937:⁹ "For let me add again, where there is no infection, there is no toxemia." A recent report from Edinburgh¹⁰ casts considerable doubt on Aldrich's theory. This report represents the experience with 200 burns, sixty-five of which were serious. There were twenty autopsies. Careful bacteriologic work was done on the burns with aerobic and anaerobic cultures. Frequently, cultures of representative areas showed no growth up to ninety hours. These authors stated that the evidence was against bacterial infection as the cause of the acute toxemia. "Certainly, there was rarely any evidence that hemolytic streptococci were flourishing in the burned area and invading the blood stream. Moreover, hemolytic streptococci were sometimes grown in pure culture from isolated portions where systemic disturbances were entirely absent."

At the Henry Ford Hospital we have been unable to convince ourselves that bacterial invasion is the significant factor in the early acute toxemia. However,

we added an antiseptic, hexyl-chloro-resorcinol, to the tannic acid after the work of Hartman and Schelling¹¹ showed the efficient bactericidal power of such a combination.

3. The third theory is that a specific toxin is formed at the burned area which is absorbed and distributed by the circulating blood, with the resultant picture of toxemia and collapse. This is the oldest theory, and it came into disrepute when Underhill pointed out the fallacies of certain previous experimental work¹² and produced evidence that there is poor absorption from burned areas. As has already been stated, the toxic theory is regaining favor. Mason and his co-workers¹³ noted no difference in the absorption of potassium iodide that was injected subcutaneously into normal tissue or into burned tissue. Mason, who worked with Davidson on the question of tissue autolysis, maintains that "death occurring several days following severe burns is due mainly to the absorption of protein decomposition products." Wilson and his collaborators¹⁴ removed the tissue fluids from edematous burned tissues forty-eight hours after the burn. They found that this fluid had acquired toxic properties and was frequently fatal to healthy animals of the same species. Rosenthal¹⁵ tested the blood of burned pigs, guinea pigs and human beings and found a histamine-like substance, which was first linked with the red cells but was later found in the serum. It differed in several ways from histamine.

PATHOLOGY

The chief addition to our knowledge of the pathology of burns since the early article of Bardeen¹⁶ in 1898 has been the emphasis on the changes in the liver. Marked necrosis of liver cells has been noted in many cases of fatal burns. This lesion was especially impressive in two cases recently under treatment. Two men climbed down into a tank which had been used to store oxygen and began to work with an acetylene torch. Their clothing suddenly burst into flames. They were able to climb out of the tank and fellow workers extinguished the fire. Second and third degree burns were sustained, which amounted to one half of the body surface of one man and one fourth of the other. In spite of intensive treatment, the man with the larger burn died in profound toxemia on the third day. Post-mortem examination showed almost total necrosis of liver tissue, shown by microscopic section in the accompanying illustration. The other man showed toxemia to a less marked degree, but the liver became palpable and jaundice appeared, the icterus index rising to 130 units. Large amounts of intravenous dextrose were given to promote regeneration of the liver, with the result that he recovered without disability.

We agree with Wilson,¹⁰ who stated: "In summary, we may say that after death from burns a lesion of the liver cells was found in many cases which was characteristic of this form of injury. Its relation to acute

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12. Robertson, B., and Boyd, G. L.: The Toxemia of Severe Superficial Burns, *J. Lab. & Clin. Med.* 9: 1-14 (Oct.) 1923.

13. Mason, E. C.; Payton, Pearl, and Shoemaker, H. A.: Comparison of the Rate of Absorption from Normal and Burned Tissues, *Ann. Int. Med.* 9: 850-853 (Jan.) 1936.

14. Wilson, W. C.; Jeffrey, J. S.; Roxburgh, A. N., and Stewart, C. P.: Toxin Formation in Burned Tissues, *Brit. J. Surg.* 24: 601-611 (Jan.) 1937.

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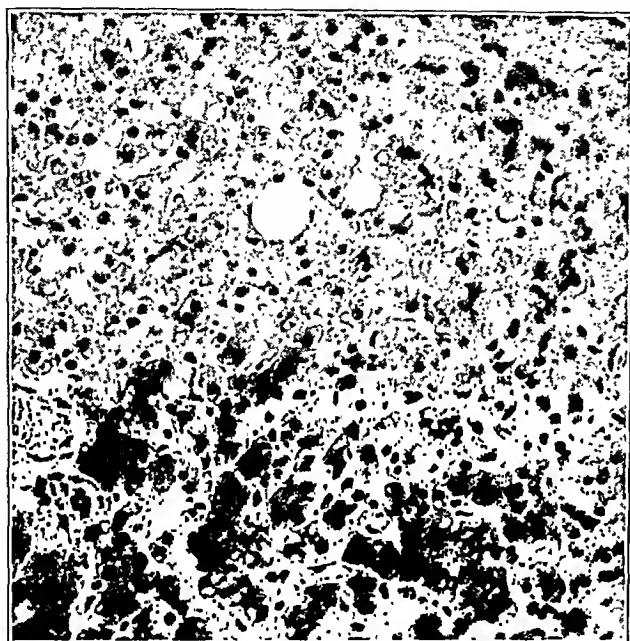
16. Bardeen, C. R.: Review of the Pathology of Superficial Burns, with a Contribution to Our Knowledge of the Pathological Changes in the Organs in Cases of Rapidly Fatal Burns, *Johns Hopkins Hosp. Rep.* 7: 137-179, 1898. Since this paper was read, an excellent report on liver necrosis in burns has appeared by T. H. Belt (*J. Path. & Bact.* 48: 493-498 [May] 1939).

toxemia was so remarkably close as to leave little doubt that the liver lesion and the acute toxemia were produced by the same mechanism. The responsible agency was certainly not bacterial infection, and in our view the liver lesion furnished the strongest evidence of a nonbacterial toxin circulating during the first few days after a burn." This reservation must, however, be made: these changes may be due to anoxia.

CHEMICAL PATHOLOGY

It is well known that there are changes in the blood chemistry in severe burns. The most constant is blood concentration, as expressed in the hemoglobin determinations and hematocrit readings. However, we have all seen cases in which the hemoglobin content has been kept at a normal level or below by intensive administration of fluid, and yet we have watched such cases proceed to death in a state of toxemia.

Based on her own investigations and those of Dr. Alfred Blalock and Dr. Anne Minot at Vanderbilt Uni-



Section under medium power of liver of burned patient who died on third day after being burned. Extensive necrosis in center of the liver lobule, with a zone of intact liver cells in periphery (lower part of section).

versity School of Medicine, Dr. Katharine Dodd¹⁷ suggests the great importance of replacing promptly the large amount of circulating protein that is lost in severe burns. This is done by serum transfusions. The mere replacement of water and salt as such will only serve to make matters worse by diluting the concentration of the protein that remains in the blood vessels. If too great a depletion of plasma volume occurs, the blood pressure falls precipitately and fatal shock ensues. It would seem better, therefore, to rely on frequent hemoglobin or hematocrit determinations and measurement of serum protein concentration than to use the systolic blood pressure as a gage of a burned patient's condition.

Other blood constituents that show variations from the normal are the chlorides, plasma proteins, carbon dioxide combining power, nonprotein nitrogen, sodium and potassium. There is good evidence to indicate that no one of these factors is a determinant in fatal cases, although further work must be done to evaluate fully the

behavior of the basic ions. Nevertheless, measures to restore the blood chemistry to normal should be carried out in order that the burned patient may be given all possible assistance during the early critical days.

MORTALITY STATISTICS

In 1935 Allen and I¹⁸ reported the status of burns after ten years' use of Davidson's method. We called attention to the fact that the Bureau of Census mortality statistics for the United States registration area showed a decrease in 1933 from the previous high figures. In 1928 there were 8,083 deaths from burns (the highest during the decade) and in 1933 there were 5,232 deaths. I regret to report that in the succeeding four years there has been no further reduction.¹⁹

The figures in the accompanying table are difficult to reconcile with the reports of the lowered mortality rates which come from various institutions. In our paper Allen and I showed a table which indicated the reduction in mortality in several centers. To this may be added the report of Mitchiner.²⁰ At the St. Thomas Hospital, London, there was a mortality of 15.5 per cent in the period 1924-1928 when picric acid was used, and a mortality of 4 per cent in the period 1929-1936 when the Davidson method was used. The mortality from scalds was reduced from 7.5 per cent to 1.7 per cent. At the Children's Hospital in Toronto Harris²¹ noted a fall in the death rate from 26.6 per cent to 12 per cent, and Herzfeld,²² at the Royal Edinburgh Hospital for Children, had a reduction of 38 per cent to 9 per cent.

In evaluating the Davidson treatment, in addition to the mortality statistics, one should consider the economic factor of great saving in amount of dressings, shorter stay in the hospital as well as the relief of pain, and the diminution of scarring and gross deformities.

TREATMENT

In the management of a severe burn, two fundamental principles must be observed. These are the prevention or treatment of shock and the carrying out of scrupulous aseptic technic in the local treatment of the burned area, which should be regarded as a large open surgical wound. The advent of the tannic acid treatment of burns was so revolutionary in character and its immediate effects so dramatic that attention has been focused on local applications alone, while the auxiliary treatment of shock has too often been neglected. This state of affairs can be explained by the fact that, except in the larger cities, the opportunity to treat severe burns is rarely presented to the practitioner. In the United States in 1937 alone there were 5,466 deaths from burns. If these cases were equally distributed among the 130,000 practicing physicians, each would have had under his care only one fatal case in more than twenty-three years of practice, and if the mortality should be placed at 20 per cent, this would mean that, on the average, each physician would treat one patient with severe burns every four and one half years. It is not surprising, therefore, that the average physician is not familiar with all the details of treatment. For his benefit, the following summary of treatment is inserted:

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20. Mitchiner, P. H.: Treatment of Burns and Scalds, *Brit. M. J.* 1: 27-30 (Jan.) 1938.

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22. Herzfeld, Gertrude: Treatment of Burns and Scalds by Tannic Acid, *Practitioner* 122: 106-111 (Feb.) 1929.

17. Personal communication to the author.

TREATMENT OF BURNS—HENRY FORD
HOSPITAL METHOD

It is important to bear in mind the necessity of treating the patient as well as the wounds. Treatment naturally resolves itself into three phases: supportive measures, local treatment of the burned areas, and after-care.

General Supportive Measures.—These are largely directed toward the control of symptoms.

1. Pain and restlessness are combated by adequate and repeated sedation.

2. Oxygen therapy may be indicated in certain severe cases.

3. External heat is applied: hot water bottles and blankets if the burned area is limited; in extensive burns, the electrically heated cradle tent and super-heated room.

4. Restoration of fluid balance is undertaken. The aim of fluid administration should be to obtain a twenty-four hour urinary output of 1,500 cc. Fluids are given by mouth if tolerated, by rectum, interstitially and intravenously. The continuous intravenous method is often indicated and may be imperative in cases of extensive burns involving the extremities. The solu-

Deaths from Burns, 1933-1937¹⁰

Year	Deaths from Burns*
1933	5,232
1934	5,758
1935	5,687
1936	5,971
1937	5,466

* These figures exclude deaths classified as due to conflagration, where suffocation or cremation may have occurred, and those due to special accidents, such as mine accidents. In 1937 there were 1,688 deaths due to conflagration and 774 deaths from special accidents, a total of 7,928 deaths by fire.

tions used are 5 per cent dextrose and physiologic solution of sodium chloride.

5. Blood plasma transfusions are done. Whole blood should be used only when blood concentration is normal, as indicated by repeated hemoglobin or hematocrit determinations. When hemoglobin values of more than 15.6 Gm. are obtained, plasma transfusions should be given.

6. Laboratory investigations are made:

(a) Frequent hemoglobin or hematocrit determinations should be made.

(b) The urine should be analyzed frequently, with determinations of the specific gravity and albumin content.

(c) Serum protein determination should be made immediately on admission.

When facilities are available, the following procedures should be done:

(d) Chloride estimations should be made at intervals so that depleted chlorides may be restored by intravenous administration of saline solution.

(e) Blood cultures may be taken.

(f) The nonprotein nitrogen should be determined.

(g) The icterus index should be ascertained as a means of recognizing toxic hepatitis or liver damage.

Local Treatment.—1. Remove all clothing under as sterile conditions as possible and place the patient on sterile sheets in a warm room.

2. Take all precautions to avoid infection of the burned area. Treat it just as any other large wound.

All dressings and applications must be done under aseptic conditions—masks, gloves and gowns must be worn by doctors and nurses.

3. Débridement should be minimal and should be limited to opening blisters and cutting away dead skin.

4. Tannic acid in a 5 per cent fresh solution is applied with an atomizer or power spray. This is a simple and effective way of tanning the burned area. This solution is sprayed on at frequent intervals until the burned area is thoroughly tanned. Ointments containing tannic acid plus an antiseptic are useful in small burns and for burns of the face and the perineum. The addition of antiseptics such as resorcinol or silver nitrate to the tannic acid with the idea of preventing infection has been employed with apparent success, but treating the burned area as a surgical open wound by taking steps to prevent the introduction of infecting organisms is an equally, if not more, effective measure.

After-Care.—1. Cut away all dead skin and open collections of fluids under aseptic precautions and then again spray tannic acid on the bared areas.

2. As the heavy tanned crust forms, watch carefully for local signs of infection under the crust and liberate collections of pus. Occasionally the first clue to these collections is evidence of systemic reaction.

3. Prevent contracture deformities by the early use of extension apparatus.

4. Employ skin grafting early and freely.

5. Detect and treat secondary anemia early. Blood transfusion is the best method of doing this in the late stages.

COMMENT

We have continued to advocate the use of tannic acid in the local treatment of the skin. Variations in the technic have been successful.²³ Other eschar-forming chemicals, such as gentian violet and silver nitrate, have given satisfactory results. The advantages claimed are that the coagulum forms more quickly and is thinner and more pliable than that produced by tannic acid. Bettman²⁴ has had excellent results with a combined tannic acid-silver nitrate treatment. He believes that the combination is superior to tannic acid alone, and his experience would tend to bear out this contention. He attributes the improvement to the increased antiseptic qualities of the mixture and to the fact that the coagulum is produced without delay. We have found that the tannic acid may be conveniently applied to the medium of a water-soluble jelly to which has been added an antiseptic of the resorcinol group.

SUMMARY

The original theory that a toxin is formed in the burned area, from which it is absorbed and carried by the circulation throughout the body, with the production of systemic effects has not yet been settled. In spite of excellent results being obtained in many centers, the death rate in the United States seems to have reached a plateau far above that lower level which is possible with our present knowledge. Disagreements regarding the proper local treatment should not distract our attention from the more important problem—the treatment of a very sick patient who has a threatening toxemia, alterations in the blood chemistry, a wound very sus-

23. Fantus, Bernard, and Dyniewicz, H. A.: Compound Solution of Tannic Acid, *J. A. M. A.* 109: 200-203 (July) 1937. Gunn, John, and Hillsman, J. A.: Thermal Burns, *Ann. Surg.* 102: 429-445 (Sept.) 1935.

24. Bettman, A. G.: Nationale of Tannic Acid-Silver Nitrate Treatment of Burns, *J. A. M. A.* 108: 1490-1494 (May 1) 1937.

ceptible to infection and pathologic changes in organs remote from the skin. The greatest good can, of course, come through preventing burns from occurring, and I believe that the family physician, through his teaching in the home, can accomplish more than any other agency in this respect.

Council on Physical Therapy

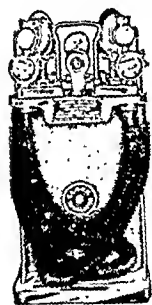
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
HOWARD A. CARTER, SECRETARY.

CLARK DUPLEX INHALATOR ACCEPTABLE

Manufacturer: Physician's Oxygen and Supply Company, Inc., 1390 Eastern Parkway, Brooklyn.

The Clark Duplex Inhalator is designed to supply a mixture of carbon dioxide and oxygen for resuscitation of victims of gas poisoning, smoke poisoning, drowning and other conditions requiring resuscitation. It provides two cylinders with attachments for using the inhalator on two patients simultaneously. In case the supply from the small cylinders proves insufficient for longer periods of operation, a larger size tank may be attached by a third connection. The unit with cylinders weighs 47 pounds out of the case and 62 pounds when weighed with the case. The outside dimensions of the case are 25½ inches long, 13 inches high and 9¼ inches deep.

One cylinder contains a 7 per cent and the other a 5 per cent carbon dioxide mixture with oxygen. The change of administration from 7 per cent to 5 per cent or vice versa depends simply on the opening and closing of one or the other cylinder valve. The cylinders are of 16 cubic feet capacity and deliver upward of 75 liters of gas per minute each. The firm also supplies cylinders of 110 cubic feet capacity if desired.



Clark Duplex
Inhalator.

The apparatus was investigated by the Council. It was found that the cylinder attachment ports are provided with check valves which prevent leakage from a cylinder in use during removal of an empty cylinder or cause equalization in pressure between two cylinders if the two are open at the same time. These valves have been tested and found to function as intended. Gas from the cylinders passes through a reducing valve. This valve is set by the maker to reduce pressure to one of about 65 pounds per square inch. A gage reading to 3,000 pounds per square inch is provided for checking the content of cylinders.

The reducing valve is provided with two safety devices to prevent the building up of dangerous pressures in case of failure of its normal mechanism: (1) In the heavy bronze casing of the reducing valve there is a small frangible disk which will rupture at a pressure of about 500 pounds per square inch and (2), should this fail to break at this pressure, the thin metal bellows, which normally operates the reducing valve by its collapse and expansion, will rupture and allow the gas to escape through an aperture plug.

If there should be a continuous free flow of oxygen from the two cylinders at once, there would result a rapid emptying of these small portable cylinders. The features peculiar to this device are largely directed toward effecting oxygen economy, however. Directly below the reducing valve is a large rubber bag, called by the makers a "breathing bag." This is in no sense a rebreathing bag. Inside this bag is a vertical lever the long arm of which is connected to the middle of the bag. The short arm operates a valve which admits oxygen from the low pressure side of the reducing valve to this rubber bag. When the bag fills to a predetermined volume the movement of the lever closes the valve. Since no great pressure is required to distend the bag to this extent, the bag virtually functions as a second sensitive reducing valve and reservoir from which the patient or patients breathe the gas. From this point on, the equipment is in duplicate.

There is a valve delicately balanced against a spiral hair spring which is opened by the small pressure within the rubber bag as soon as the pressure within the face mask and breathing tube is reduced slightly below atmospheric pressure by an inspiratory effort of the patient or by the corresponding part of the cycle of artificial respiration. The stem of this valve is geared to an indicating needle, which moves over a dial and indicates the depth of respiration. These devices were tested in a laboratory in duplicate and found to operate satisfactorily. The face masks are provided with inflatable soft rubber edges for effecting gas-tight contact with the face and provided with elastic holding bands. The metal connection for attaching the corrugated rubber breathing tube carries the exhalation valve. A careful test was made to determine whether powerful exhalation would force any appreciable quantity of exhaled air into the rubber bag. It was found that practically all of the air escaped through the exit valve at the mouthpiece. When used as described, oxygen is fed into the mouthpiece only when the valve which actuates the breathing depth indicator is operated by inspiratory efforts. A lever at the side of the depth-of-breathing indicator case may be turned up, leaving this valve fully open. Oxygen then flows freely to the mouthpiece, and the indicator needle remains fully deflected. Oxygen in excess of that breathed escapes by the mouthpiece exit valve.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Clark Duplex Inhalator for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.
PAUL NICHOLAS LEECH, SECRETARY.

**AMPOULES SODIUM CACODYLATE INTRA-
VENOUS-UPJOHN, 0.45 Gm. (7 grains), 5 cc.,
and AMPOULES SODIUM CACODYLATE
INTRAVENOUS-UPJOHN, 1 Gm. (15½
grains), 10 cc., NOT ACCEPT-
ABLE FOR N. N. R.**

The Upjohn Company presented these ampules of sodium cacodylate (among others) for consideration as to inclusion in New and Nonofficial Remedies. From the names on these packages it is apparent that they are for intravenous use. The Council holds that the desired effects of sodium cacodylate may be achieved by oral administration of the drug or, in exceptional cases, that the intramuscular route may be desirable. The Council has on other occasions pronounced similar dosage forms unacceptable (*THE JOURNAL*, May 7, 1932, p. 1654; Dec. 23, 1933, p. 2050).

The Council was therefore obliged to hold Ampoules Sodium Cacodylate Intravenous-Upjohn, 0.45 Gm. (7 grains), 5 cc., and Ampoules Sodium Cacodylate Intravenous-Upjohn, 1 Gm. (15½ grains), 10 cc., not acceptable for inclusion in New and Non-official Remedies. This does not apply to Ampoules Sodium Cacodylate-Upjohn for intramuscular use.

**DIMENFORMON AND DIMENFORMON BEN-
ZOATE (ROCHE-ORGANON, INC.) NOT
ACCEPTABLE FOR N. N. R.**

Dimenformon (Estradiol) and Dimenformon Benzoate (Estradiol Benzoate) of Roche-Organon, Inc., are partially synthesized products which are claimed to be effective estrogens. It is not the purpose of this report to criticize the quality of Roche-Organon estrogenic products, but exception is taken to the unethical and undesirable advertising methods used in the promotion of these estrogens to the physician. In a recently distributed circular on "Effective Estrogenic Therapy" there are listed about thirty or more "indications" for estrogenic therapy with Dimenformon and Dimenformon Benzoate "based on a very careful study of published clinical data augmented by private clinical

reports." Among the conditions for which the firm recommends estrogen therapy based on "very careful study" are leg ulcers, Buerger's disease, polyarthritis, certain ocular diseases and other disorders which have little or no endocrine relationship.

Physicians, even those having no special knowledge of the endocrines, may readily recognize the lack of scientific evidence for these therapeutic claims, and a detailed discussion of these recommendations would therefore be superfluous.

Other disorders, however, which bear some relation to the endocrine glands are being exploited by Roche-Organon (and other pharmaceutical houses) in a more subtle manner. For instance, estrogenic therapy of menstrual disorders has been the subject of considerable experimental work ever since the estrogens have been made available clinically. Except for the conditions of menopause (artificial or spontaneous) little progress has been made in the effective treatment of such disorders. Many of the reports on the clinical experimental use of estrogens have been unscientific and worthless; others demonstrate results which raise doubts as to their reliability. Many of the claims advanced by Roche-Organon appear to be based on such uncontrolled and unconfirmed reports.

Physicians well realize that the physiology of menstruation is at present only partially understood. It is true that uterine bleeding can be induced in the castrate by means of estrogens, but there are certain features of spontaneous normal menstruation which are subject to speculation and have not been satisfactorily explained as yet. It is no wonder, therefore, that disorders of menstruation are even less well understood. Functional dysmenorrhea, for example, has no established etiologic factor in most instances, despite the numerous theories concerning the role of the absence of corpus luteum, excess of estrogen, infantile uterus or neurogenic disorder. There are probably several types of dysmenorrhea and the outright recommendation that estrogens are of value in dysmenorrhea, in general, indicates a lack of understanding of this problem. Many factors, doubtless, are involved in the etiology of functional menorrhagia. The fact that excess bleeding can occur in the presence of a hyperplastic secretory or a resting endometrium is evidence of the different types of ovarian function associated with this condition. Similarly, amenorrhea may occur with either resting, hyperplastic or secretory endometrium, illustrating again the multiplicity of phases of ovarian activity associated with menstrual disorders. On the face of the matter, therefore, it is highly unreasonable to believe that one substance (estrogen) can alleviate or cure menstrual disorders ranging widely from amenorrhea to menorrhagia, including dysmenorrhea.

Other conditions for which estrogens have been advocated after the "careful studies" of Roche-Organon are on an even less sound basis. Toxemias of pregnancy, mastopathies, prematurity in infants, migraine and pituitary dysfunctions have all received one or more trials with estrogens. There is a definite lack of adequate confirmatory evidence in most of these reports. The rationale for estrogenic therapy here is usually quite flimsy, based mainly on assumption and imagination. The exercising of even mild discrimination would at least result in the acknowledgment that estrogenic therapy in these conditions is still mainly experimental.

The uncritical attitude of this firm is characterized by some of the statements appearing in its advertising matter. Thus, estrogens are suggested for the treatment of primary amenorrhea "of uncertain origin" and vaginitis of "non-specific" etiology occurring in children (!) Such a recommendation implies, in effect, that one is justified in prescribing treatment (estrogenic) when in doubt.

Matching the boldness of the suggestions for estrogenic therapy is the advice on the actual treatment of these conditions. In columns adjoining the recommended indications, the exact dosage of hypodermic and oral estrogens and any auxiliary treatment recommended is stated. The presence of printed figures on dosage gives an air of undisputed authority and finality to the recommendations. It would be interesting to learn of the sources from which the data were obtained. Especially valuable would be the firm's references on oral therapy since the reports in the scientific literature are relatively few. Not only should the accuracy of the information be challenged, but the physician should resent the aggressiveness of this firm in advertising in detail so-called instructions in a field of therapy

which is as controversial and unsettled as the one in question. Reliable information of this nature may be found by consulting scientific publications, and the usurpation of their function by commercially minded institutions should not be condoned.

Too much has already been made of the mysteries of endocrinology. It would be safe to say that the so-called mysteries and complexities are merely reflections of our present lack of knowledge of glandular physiology and therapy. Such a condition usually results when it is attempted to explain many phenomena on the basis of few facts. Much of our uncertainty has arisen from the discrepancies and unreliability of some of the endocrine literature. The result has been confusion and misunderstanding. Some of the manufacturers of pharmaceuticals have not been unaware of this state and undoubtedly have profited much from it. The advertisement "Effective Estrogenic Therapy" (Roche-Organon) is a clear example of the meretricious appeal to those physicians who are in no position to evaluate the recently expanded endocrine literature.

The Council voted that Dimenformon and Dimenformon Benzoate (Roche-Organon, Inc.) be declared unacceptable for inclusion in New and Nonofficial Remedies because of the exaggerated and unwarranted advertising claims with which they are marketed.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

RACEPHEDRINE.—Racemic Ephedrine.—d-1-Ephedrine.— $C_{10}H_{15}ON$.—d-1- γ -hydroxy, β -methylaniline phenyl propane. *Actions and Uses.*—The same as those of l-ephedrine.

Dosage.—From 30 to 50 mg.

Racephedrine is a colorless, crystalline substance. The melting point of the free base is 79 (microscopic heating stage). It is readily soluble in water, alcohol and ether. Weigh out, accurately, 0.2 Gm. of racephedrine and transfer to a desiccator over phosphorus pentoxide for fifteen hours at room temperature; the loss of moisture is not more than 0.5 per cent. Incinerate 0.1 Gm. of racephedrine, accurately weighed, and previously dried to constant weight; no residue remains. Dissolve approximately 0.5 Gm. of racephedrine in 20 cc. of water; the aqueous solution does not show optical activity and does not give the U. S. P. XI chloride or sulfate test.

For further identification see under racephedrine hydrochloride (*The Journal*, April 1, 1939, p. 1257).

Transfer 0.25 Gm. of racephedrine, accurately weighed, and previously dried over phosphorus pentoxide for five hours at room temperature; to a beaker. Add 10 cc. of distilled water and titrate with 0.1 normal sulfuric acid in a slight excess, using methyl red as indicator. Back-titrate with 0.1 normal sodium hydroxide. Each cubic centimeter of 0.1 normal sulfuric acid is equivalent to 0.01651 Gm. of anhydrous racephedrine.

Racephedrine-Gane's Chemical Works, Inc.—A brand of racephedrine-N. N. R.

Manufactured by Gane's Chemical Works, Inc., New York. No U. S. patent or trademark.

RACEPHEDRINE SULFATE.—Racemic Ephedrine sulfate.— $C_{10}H_{15}ON.H_2SO_4$.

Actions and Uses.—The same as those of l-ephedrine sulfate.

Dosage.—From 30 to 50 mg.

Racephedrine sulfate is a colorless, crystalline substance. The melting point is 247 C. (microscopic heating stage). The solubility is fair in water and alcohol. Dissolve 0.5 Gm. in 25 cc. of distilled water. The aqueous solution is neutral to litmus and does not show optical activity. The U. S. P. XI test for chloride is also negative. Weigh out accurately 0.25 Gm. of racephedrine sulfate and dry to constant weight over sulfuric acid in a desiccator at room temperature; the loss is not more than 2 per cent of its weight; 0.25 Gm. of racephedrine sulfate has a negligible ash residue. The assay for anhydrous racephedrine, as described in racephedrine hydrochloride, is not more than 77.5 per cent nor less than 75.5 per cent.

Racephedrine Sulfate-Gane's Chemical Works, Inc.—A brand of racephedrine sulfate-N. N. R.

Manufactured by Gane's Chemical Works, Inc., New York. No U. S. patent or trademark.

SUPRARENIN (See New and Nonofficial Remedies, 1938, p. 232).

The following dosage form has been accepted:

Tablets Suprarenin, 0.02 Gm.: Each tablet contains suprarenin bitartrate 0.0364 Gm., equivalent to suprarenin 0.02 Gm., with lactose 0.0385 Gm., and acetone sodium bisulfite not more than 0.0001 Gm.
Prepared by Winthrop Chemical Co., Inc., New York, N. Y.

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SATURDAY, NOVEMBER 11, 1939

THE PLUMMER-VINSON SYNDROME AND CANCER

The Plummer-Vinson syndrome, which appears to occur mostly if not exclusively in women, is characterized by hypochromic anemia, with or without achlorhydria, dysphagia and chronic inflammatory and atrophic changes in the mouth, pharynx and upper end of the esophagus. According to the observations of Ahlborn¹ at Radiumhemmet in Stockholm the syndrome brings with it a special liability to cancer in those structures. As a rule the afflicted women are poorly developed and poorly nourished; weakness and anemia may have existed for years, the first symptoms commonly appearing at the ages of from 18 to 20; sometimes anemia, sometimes dysphagia is the more prominent; in the milder forms the dysphagia may be missed easily by the clinician. All observers agree that, while liver preparations are without curative effect, iron in large doses leads to improvement, even to apparently complete recovery; only too frequently the anemia returns and the dysphagia may become more or less continuous for years. Such patients eat slowly and swallow only a little at a time; occasionally only liquids can be swallowed; there may be choking spells due to spasm. In addition to the anemia and dysphagia there develop, as is true also in some degree in pernicious anemia, chronic inflammatory and atrophic changes in the lips, the tongue and the buccal and pharyngeal mucous membranes as well as in the upper part of the esophagus, the entrance to which is narrowed. These membranes become dry and inelastic, the tongue smooth and glazed, the lips thinned, stiff and cracked at the corners, the face gradually taking on a characteristic change. Early loss of teeth is common. Buccal leukoplakia may develop and the nails may turn spoon shaped (koilonychia). In about one fourth of the cases the spleen has been found to be enlarged. No systematic studies

appear to have been made of the blood chemistry, the metabolism or the structural changes in cases of the syndrome. In a case in which death occurred from puncture of the esophagus by a filiform bougie, Suzman² found hyperkeratinization of the oropharyngeal mucosa, lymphoid infiltration in the submucosa and atrophy of the muscular coat—changes currently regarded as "precancerous." The real nature and cause of the Plummer-Vinson syndrome or disease are not known; all observers agree that it concerns a nutritional deficiency or imbalance in which the lack of iron plays a part of fundamental importance as indicated by its curative action, but no deeper studies appear to have been made into the genesis of the condition. The limitation of the disease to women suggests that it is connected in some way with functions, endocrine and otherwise, peculiar to women.

The occurrence occasionally of cancer in women suffering from the Plummer-Vinson syndrome has been noted by several observers.² On the basis of a study of the rich clinical material at Radiumhemmet, Ahlborn has shown that there is a definite relation of the syndrome to cancer. The first two instances observed suggestive of such a relation concerned multiple squamous cell cancer of the cheek in women who had had Plummer-Vinson symptoms for years. It soon became quite clear that a high percentage of the women with squamous cell cancer of the mouth, pharynx and upper part of the esophagus had had anemia and dysphagia. Exact final figures are not yet available, but of ninety-four cases studied with particular reference to the Plummer-Vinson syndrome during 1931-1935 the outcome was positive in fifty-seven instances (60 per cent). The relatively greater frequency than elsewhere³ of oral and pharyngeal cancer, and especially of post-cricoid cancer, in women among the patients at Radiumhemmet is of course also significant. Ahlborn¹ states that in Radiumhemmet 90 per cent of the cases of post-cricoid cancer occurred in women and that of these women 90 per cent reported a record like that of the Plummer-Vinson syndrome. There is every reason to look forward with special interest to the results of further study. The indications are that in Sweden at least the Plummer-Vinson syndrome in women is a highly important predisposing factor to cancer in the mouth, the pharynx and the upper part of the esophagus. How is it elsewhere? It is noteworthy that there seems to have been uncovered an apparently preventable malnutritional condition that greatly favors the development of cancer. Early diagnosis of the condition with prompt and effective treatment, curative and preventive, is needed in order to forestall cancer, the foundations for which may be laid long in advance of its appearance.

1. Ahlborn, Hugo E.: Anemia, Glossitis and Dysphagia (Plummer-Vinson's Syndrome) in Anamnesis of Women with Cancer of Oral Cavity, *Nord. med. tidskr.* 11: 171 (Jan 31) 1936; Simple Achlorhydric Anemia, Plummer-Vinson Syndrome, and Carcinoma of Mouth, Pharynx and Oesophagus in Women, *Brit. M. J.* 2: 331 (Aug. 15) 1936.

2. Suzman, M. M.: Syndrome of Anemia, Glossitis and Dysphagia, *Arch. Int. Med.* 51: 1 (Jan.) 1933. Kelly, A. B.: *J. Laryng. & Otol.* 34: 285 (Aug.) 1919; 42: 221 (April) 1927. Turner, A. L., *ibid.* 28: 281, 1913; 35: 34 (Feb.) 1920. Cameron, J. A. M., *ibid.* 44: 168, 1927. Laub, R.: *Acta oto-laryng.* 26: 668, 1938.

3. Cutler, Max, and Buschke, Franz: *Cancer: Its Diagnosis and Treatment*, Philadelphia, W. B. Saunders Company, 1938, p. 181.

CRITICAL CREOSOTE CRITERIA

A recent Report of the Council on Pharmacy and Chemistry of the American Medical Association¹ indicated that creosote and its allied preparations have received more promotion and widespread application in the past than is warranted by the available pharmacologic evidence. The Council found little published scientific evidence to substantiate claims of some drug firms for the value of these compounds in the treatment of various pulmonary conditions. Before reaching a final decision the Council sent a questionnaire to members of the Association of American Physicians and the American Pediatric Society. The result of this survey confirmed the Council's conclusions and indicated that such drugs are rarely employed by leaders in the profession and that their rationale is little understood by those who do employ them. The Council omitted all such preparations from New and Nonofficial Remedies because they are marketed without satisfactory evidence that they have sufficient therapeutic value and their use is based entirely on empiricism.

Fellows,² who previously reported three studies of a series now reports a critical study of the effect of orally administered calcium creosotate on the twenty-four hour sputum of patients with pulmonary tuberculosis. This author indicates that the purpose of his fourth investigation was to determine whether or not any modification of twenty-four hour sputum specimens could be demonstrated during a period of calcium creosotate administration. To accomplish this the author measured the volatile phenol content and the volume of these specimens in a total of fifty-six cases showing similar degrees of lung change. Approximately half of these were used as controls to compare with the patients who received the drug. In spite of the fact that estimations of the volatile phenols excreted in the urine of patients who received the highest oral doses of the drug indicated adequate absorption, significant change in either the sputum phenols or sputum volumes was not observed in any of the cases during the period of calcium creosotate administration. In one group not more than two 0.26 Gm. tablets three times a day could be given because of nausea after administration for a period of one month. In another group the majority of patients tolerated doses as high as four tablets three times a day for a period of five months.

The author emphasizes the conclusiveness of his observations because of the large doses administered to many of the patients. Significantly an equal number of patients were unable to tolerate such large doses for a shorter period, which further emphasizes the useless-

ness of the employment of such treatment in pulmonary disorders on the basis that an appreciable phenol concentration in the lungs is produced. The author's failure to find evidence of excretion of phenols in the sputum of patients who received calcium creosotate suggested the necessity of investigating expired air of animals given the drug. Observations on six rabbits revealed that phenolic material was not present in their expired air during a period of eight to eighteen hours after each animal had been given 0.5 Gm. of water-soluble calcium creosotate phenols by stomach tube.

The results of the entire study not only invalidate the reports of other workers who attempted to establish a rationale for creosote compounds in pulmonary disorders on the basis of change in the expired air during administration of such drugs but also disprove previous claims for symptomatic relief because of the increase in expectoration and appetite or lessening of cough. The author selected tuberculous patients for the study only because such cases provide a more constant daily output of sputum, whereas in most bronchial diseases the daily variation in volume of sputum is so great that it is impossible to conduct reliable control studies. The absence of adequate controls probably explains many of the statements in the literature concerning the changes in volume of sputum after creosote. Such statements appear to be the result of isolated observations on persons who might have shown the same changes without the drug.

BACTERIA, THE SMALLEST OF
LIVING THINGS

The famous paper of the plant physiologist Ferdinand Cohn entitled "Bacteria, the Smallest of Living Things" introduced scientific bacteriology; it was first published in Berlin, Germany, in 1872 and has just been issued in an English translation in the *Bulletin of the History of Medicine* and as a separate reprint.¹ Morris C. Leikind has added an informative and interesting preface. The paper was translated in 1881 by Charles S. Dolley, who, by the way, spent several years as a student in Europe, at the university in Leipzig and at the zoological station in Naples. Dolley, while yet a medical student at the University of Pennsylvania, read Cohn's paper in the original German. Recognizing at once its importance for the entire field of biology and bacteriology, he published the translation which is the basis of this new edition.

Cohn's systematic investigations of the life of the microbe world began in 1851. The basis of systematic bacteriology even today is his classification of plant micro-organisms named according to their forms: cocci, bacteria, bacilli, vibrios, spirilla and spirochetes. His discovery of spores, that form of bacteria which continues to live even after life for the bacterium proper

1. Creosote and Guaiacol Compounds Omitted from N. N. R., J. A. M. A. 110:209 (Jan. 15) 1938.

2. Fellows, E. J.: Studies on Calcium Creosotate: IV. Observations on Its Use in Pulmonary Tuberculosis, Am. J. M. Sc. 197:683 (May) 1939. (These studies were conducted under a grant from the Maltbie Chemical Co., Newark, N. J.)

1. Baltimore, Johns Hopkins Press, 1939.

has become impossible, is one of the most important experimental observations in the field of plant physiology.

Bacteriology cannot be regarded merely as a branch of medical science. The discovery of the pathogenic germs, chiefly due to Pasteur and Koch, was important for the science of pathology and especially for the study of infectious diseases; but the number of those bacteria which play a part as agents of diseases and have become commonly known is relatively insignificant in the total kingdom of microbes. Where there are fifty or a hundred bacterial agents of human and animal diseases there are thousands of different species in the microbe world. Great biologic importance is due to bacteria and related fungi, which play a decisive part in the decomposition of organic matter; i. e. in decay and putrefaction of dead plant and animal bodies, in fermentation and normal digestion, in the loosening of the soil, in the aggregation of nitrogen in the roots of certain plants, in the reduction of sulfur, also an indispensable element for life, and in numerous other biologic processes. Cohn's classic paper is still important today because he, "like nobody before or after him," as the present editor remarks in his preface, "has so brilliantly and clearly indicated the position of bacteria in the general economy of nature." Cohn describes the eternal circle of organic life. His essay is just as well worth reading today as when it was first published in 1872; it is not really antiquated in essentials. Thus he writes, according to his English translator (page 25 of the new edition):

The whole arrangement of nature is based on this, that the body in which life has been extinguished succumbs to dissolution in order that its material may become again serviceable to new life. If the amount of material which can be molded into living beings is limited on the earth, the same particles of material must ever be converted from dead into living bodies in an eternal circle; if the wandering of the soul be a myth, the wandering of matter is a scientific fact. If there were no bacteria, the material embodied in animals and plants of one generation would after their decease remain bound, as are the chemical combinations in the rocks; new life could not develop, because there would be a lack of body material. Since bacteria cause the dead body to come to the earth in rapid putrefaction, they alone cause the springing forth of new life and therefore make the continuance of living creatures possible. The wonderful fact that putrefaction is a work performed by bacteria does not stand alone; there is an entire series of chemical changes which are produced by bacteria and similar microscopic forms. These processes are usually designated as fermentation phenomena, and the organisms which cause the same as fermentation fungi.

Ferdinand Cohn, director of the plant-physiologic institute at the university of Breslau, aroused special interest in medical history in still another way. That was his meeting with Robert Koch. When Cohn published his paper on "Bacteria, the Smallest of Living Things," in 1872 Koch was still completely unknown. In 1876, when Koch demonstrated his discovery of the life cycle of anthrax bacilli, he was still a simple country doctor and he presented himself and his work to Cohn. From the blood of infected animals Koch had been able to grow these bacilli in pure culture and had been first

to prove experimentally the significance of anthrax spores. These resistant spores become mature bacilli. With the pure cultivated germs Koch was able to produce real anthrax or splenic fever in the bodies of susceptible animals. That important discovery was the first of Koch's great accomplishments in the etiology of infectious diseases. The memorable demonstration began on April 30, 1876, and lasted for three days. "Koch completely convinced his audience of his discovery, and Cohn's enthusiasm was boundless."

Ferdinand Cohn tried at once to remove all obstacles from Koch's way. He not only published in his own periodical (*Beiträge zur Biologie der Pflanzen*, 1876) the paper, fundamental for medical bacteriology, but also did his best to secure for Koch an adequate position in Berlin. Thus the botanist Ferdinand Cohn prepared the way for the medical man Robert Koch. The aging Virchow, then president of the Berlin Medical Society, met the young investigator and colleague with the greatest skepticism. This went so far that in 1882 Koch was not permitted to deliver before the medical society his lecture on the Etiology of Tuberculosis, a lecture which later became world famous. Ferdinand Cohn was free from the malevolent jealousy which has unfortunately played a part in scientific competition among important scholars. Cohn's own work was fundamental as the basis of scientific bacteriology. The republication of this classic paper (in the original English translation) is most commendable.

Current Comment

AMERICAN DOCTORS ON POSTAGE STAMPS

Last year *THE JOURNAL*¹ called attention to the disparity between the number of physicians in other countries who had been honored by special issues of postage stamps and the number so honored in the United States. Now the United States Postoffice Department announces a famous American series of postage stamps which will soon be issued. Among some thirty Americans to be thus memorialized are two physicians, Major Walter Reed of the U. S. Army Medical Corps and Dr. Crawford W. Long of Georgia. Although other names might well have been added to this brief list, no one will deny that the two selected fully merit this honor. Our Eastern shores and many of our cities were invaded some ninety-five times by yellow fever before Drs. Reed, Carroll, Agramonte and Lazear conducted experiments in Cuba which demonstrated that yellow fever is transmitted by the bites of certain species of mosquitoes. Yellow fever had been present in the Western hemisphere for at least 300 years and had caused tens of thousands of deaths. Following this discovery by Walter Reed and his associates in 1900, yellow fever soon disappeared from North America and has never returned. Dr. Crarr-

1. Medical Portraits on Stamps, J. A. M. A. 111: 536 (Aug. 6) 1914.

ford W. Long, a general practitioner of medicine, on March 30, 1842, first used sulfuric ether as an anesthetic during the performance of a surgical operation. Dr. Long performed this operation on James M. Venable in Jefferson, Jackson County, Ga., a small town then many miles from a railroad. The general practitioner of medicine and the army medical officer thus memorialized typify the benevolent character of the service which physicians give to suffering humanity.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Changes in Health Officers.—Dr. Walter J. Broad, Montgomery, has been appointed health officer of Bullock County, succeeding Dr. Hubert R. Owen, Union Springs, who resigned to do postgraduate work at the University of Pennsylvania, it is reported. Dr. Benjamin S. Black, Grove Hill, has resigned as health officer of Clarke County.

Auditorium for County Medical Society.—The Jefferson County Medical Society opened its new auditorium in the new Hillman Clinic Building, Birmingham, with a postgraduate seminar September 8-9. The auditorium has a seating capacity of 300 and has an adjoining club room. Included with the furnishings are provisions for a loud speaker, a talking moving picture machine and a stationary screen. The seminar was the first held by the county medical society and it is planned to make it an annual affair. The speakers included:

Dr. Angus M. McBryde, Durham, N. C., Recent Investigations on the Prevalence and Treatment of Undulant Fever.
Dr. Benjamin S. Barringer, New York, Malignant Conditions of the Genito-Urinary Tract.
Dr. William F. Riehoff Jr., Baltimore, Surgical Treatment of Carcinoma of the Lung.
Dr. Elmer L. Sevringhaus, Madison, Wis., Pituitary Therapy in General Practice.
Dr. Hobart A. Reimann, Philadelphia, Treatment of Pneumonia.
Dr. Eugene F. Traub, New York, Dermatomyiasis.

CALIFORNIA

Society News.—At a meeting of the Los Angeles Society Neurology and Psychiatry October 18 the speakers were Emil Seletz on "Brain Tumor with Abdominal Symptoms"; David L. Reeves, "Epidural Hemangioma Associated Hemangioma of the Vertebra," and Cyril B. Courville, "Genesis and Pathology of Intracranial Aneurysm." The Surgical Treatment of Pulmonary Tuberculosis "Limitations of the Trudeau Society in Los Angeles October 24.

Personal.—Dr. Walter Rapaport, Imola, has been appointed superintendent of the Mendocino State Hospital, Talmadge, succeeding Dr. Ruggles A. Cushman, who resigned October 1. Col. James A. Mattison, for sixteen years chief medical officer in charge of the Veterans Administration Facility, West Los Angeles, has announced his retirement, it is reported. A reception was held prior to departure to his ranch in Glendora. Dr. William J. Quinn has resigned as health officer of Eureka to accept a similar position with Humboldt County.

COLORADO

State Medical Election.—Dr. William H. Halley, Denver, was chosen president-elect of the Colorado State Medical Society at its annual convention in Colorado Springs October 7 and Dr. John W. Ames, Denver, was installed as president. Dr. Carl W. Maynard, Pueblo, was elected vice president. The 1940 meeting will be held in Glenwood Springs. At the recent session it was decided to appoint a committee on milk control to carry on a campaign for uniform milk regulations in all Colorado communities.

Resolution Adopted by State Examiners.—The state board of medical examiners adopted a resolution October 3 making a physician ineligible for licensure in Colorado who attempts the practice of medicine in the state, either alone or

through association with a licensed physician, without first obtaining a license. The resolution reads as follows:

Any physician who attempts to practice medicine in the State of Colorado, either alone or through association with a licensed physician, without first having obtained a license from the state board of medical examiners shall be considered to have violated the provisions of Section 17, Chapter 109, Colorado Statutes Annotated 1935, and he shall not be considered eligible subsequently to appear as an applicant for medical licensure.

CONNECTICUT

Personal.—Dr. Joseph I. Linde, New Haven, has been appointed a member of the state tuberculosis commission to serve the unexpired term of the late Dr. Stephen J. Maher.

Hospital News.—The Dillon Memorial Building, a new unit of the St. Francis Hospital, Hartford, was recently dedicated by Miss Catherine Dillon, Hartford, was recently dedicated by her brothers, Edward and Charles.

Medical History Library.—The establishment in the Yale University School of Medicine, New Haven, of a library devoted to the history of medicine has been announced. Collections of Dr. John F. Fulton and of the late Dr. Harvey Cushing, both of the Yale faculty, will serve as a nucleus of the library, and Dr. Arnold C. Klebs, Les Terrasses, Nyon, Switzerland, has announced that he is devoting to Yale his library on the history of science and of medicine, including his apparatus for the study of early texts. To house the collection be extended by the use of funds set aside by the Yale Corporation from the estate of John W. Sterling. The extension will be Y shaped with accommodations for 400,000 volumes. In one prong of the Y will be the historical collections, in the other a working library for the school. Construction will begin within the near future, it was stated.

DELAWARE

State Medical Election.—Dr. Bruce Barnes, Seaford, was chosen president-elect of the Medical Society of Delaware at its annual session in October. Dr. Meredith I. Samuel, Wilmington, will take office as president in January. Dr. John H. Mullin, Wilmington, is secretary. Rehoboth Beach was designated as the place for the 1940 meeting, the time to be determined later.

GEORGIA

Society News.—The Georgia section of the Southeastern Surgical Congress and the Seventh District Medical Society held a joint session at the Coosa Country Club, Rome, October 4.—Dr. Stephen T. Brown, Atlanta, among others, discussed "Tuberculosis of the Bladder" before the Fulton County Medical Society, Atlanta, October 19.

Changes in Health Officers.—The state department of health announces the following changes in health officers:

Dr. James H. Litton, Carbon, W. Va., succeeding Dr. Stuart P. Vandivier, Milledgeville, as commissioner of health for Baldwin County, August 26.
Dr. George M. Anderson, Morgan, succeeding Dr. Luther A. Brendle, Eastman, as commissioner of health for Dodge County, September 6.
Dr. Vandivier succeeding Dr. William F. Castellow, Americus, as commissioner of health for Sumter County, September 1.
Dr. Oliver W. Jenkins, Edison, succeeding Dr. Clair A. Henderson, Dawson, of Terrell County.
Dr. Albert G. LeRoy, Lyons, has resigned as health commissioner of Toombs County, effective September 25, to accept a similar position succeeding Dr. Robert H. Haralson Jr., Tifton, in Tift County. The latter plans to engage in private practice in Calderwood, Tenn.

District Meeting.—The Fifth District Medical Society was addressed at the Academy of Medicine, Atlanta, October 5 by the following, among others:

Dr. Clarence O. Sappington, Chicago, The Etiologic, Diagnostic and Medicolegal Problems of Occupational Diseases.
Dr. George H. Semken, New York, The Practitioner and the Cancer Problem.
Dr. Ray M. Balyeat, Oklahoma City, Diagnosis and Treatment of Common Allergic Manifestations Encountered by the General Practitioner.

Dr. Edgar Hill Greene, president of the Fulton County Medical Society, gave the address of welcome.

ILLINOIS

Personal.—Dr. Henry B. Knowles, assistant managing officer of the Peoria State Hospital, has been appointed acting managing officer of the Anna State Hospital, succeeding Dr. Andrew F. Barnett, resigned.—Dr. Paul H. Harmon, Springfield, has resigned as superintendent of the division of handicapped children in the state department of welfare to engage in private practice in Fresno, Calif.

Society News.—Dr. Italo F. Volini, Chicago, discussed "Sulfapyridine Treatment of Pneumonia" before the Ogle County Medical Society October 26.—At a meeting of the LaSalle County Medical Society at Starved Rock October 26 Dr. Lowell D. Snorf, Chicago, spoke on "Functional Disorders of the Stomach and Intestines."—Dr. Jesshill Love, Louisville, Ky., addressed the St. Clair County Medical Society October 5 in East St. Louis on "X-Ray in Treatment of Skin Malignancies."

Chicago

Dr. Kronfeld to Direct Postgraduate Education.—Dr. Peter Kronfeld, professor of ophthalmology at Peiping Union Medical College, Peiping, China, for the past six years, has been appointed dean of instruction at the Illinois Eye and Ear Infirmary. This is a new position, in which Dr. Kronfeld will supervise instruction of interns and residents and will have charge of short courses to be given at various times at the infirmary. Dr. Kronfeld, who graduated from the University of Vienna Faculty of Medicine in 1923, came to Chicago in 1928 as assistant professor of ophthalmology at the University of Chicago. In 1929 he became associate professor and remained on the faculty until he went to Peiping in 1933.

Dr. Post Made Dean of Rush Graduate School.—Dr. Wilber E. Post, clinical professor of medicine at Rush Medical College and president of the staff of Presbyterian Hospital, has been appointed dean of Rush Graduate School of Medicine. Organization of the new program of graduate work to become effective in 1942 (*THE JOURNAL*, October 14, p. 1498) will now begin under Dr. Post's direction. Dr. Post was born in Lowell, Mich., in 1877 and graduated at Rush Medical College in 1903, joining the faculty two years later. He has served as clinical professor of medicine since 1916. He has also been a member of the board of trustees of the University of Chicago since 1919, but under the practice of the board his acceptance of the administrative position required his resignation as trustee.

IOWA

Dr. Geiling Gives Rockwood Lecture.—Dr. Eugene M. K. Geiling, professor of pharmacology, Division of Biological Sciences, University of Chicago, will deliver the third annual Paul Reed Rockwood lecture at the State University of Iowa College of Medicine, Iowa City, November 15. His subject will be "Comparative Anatomy and Pharmacology of the Pituitary Gland."

Society News.—Dr. Leo H. LaDage, Davenport, discussed "Plastic Procedures in General Practice" before the Bremer County Medical Society in Waverly September 27.—At a meeting of the Cass County Medical Society in Atlantic September 21 Dr. Walter A. Anneberg, Carroll, spoke on "Treatment of Pneumonia with Sulfapyridine."—At a meeting of the Lee County Medical Society in Keokuk October 20 the speakers were Drs. John I. Brewer on "Uterine Bleeding"; Grant H. Laing, "Clinical Importance of Pylorospasm"; George W. Hall, "Newer Treatment of Mental and Nervous Diseases," and Fremont A. Chandler, "Low Back Pain." All are from Chicago.

Postgraduate Courses.—Postgraduate extension courses are now under way in the first, second, third, fourth and tenth districts of the state. Participating in these courses as instructors are:

- Dr. Fred M. Smith, Iowa City, Diagnosis and Treatment of Coronary Thrombosis.
- Dr. Willis M. Fowler, Iowa City, The Anemias.
- Dr. John H. Peck, Oakdale, Pulmonary Tuberculosis.
- Dr. Nathaniel G. Alcock, Iowa City, Management of Common Urinary Disorders.
- Dr. William F. Mengert, Iowa City, Common Gynecologic Disorders.
- Dr. Donald C. Conzett, Dubuque, Minor Surgery.
- Dr. Arnold S. Jackson, Madison, Wis., The Acute Abdomen.
- Dr. Everett D. Plass, Iowa City, Treatment of Leukorrhea.
- Dr. Adolph L. Saks, Iowa City, Diagnosis and Treatment of Neurosis.
- Dr. Daniel L. Sexton, St. Louis, Endocrine Therapy: Its Application in General Practice.
- Dr. Fremont A. Chandler, Chicago, Basic Problems in the Management of Fractures.
- Dr. Roger L. J. Kennedy, Rochester, Minn., Gastrointestinal Disturbances in Infants and Children; Convulsive Attacks in Infants and Children.
- Dr. William D. Paul, Iowa City, Hypertension with Complicated Heart Lesions.
- Dr. Lester R. Dragstedt, Chicago, Endocrinology.
- Dr. Henry W. F. Woltman, Rochester, Minn., Neuritis.
- Dr. Edwin B. Winnett, Des Moines, Management of Diabetics.
- Dr. Leon S. McGoggan, Omaha, Common Obstetric Abnormalities.
- Dr. Lewis M. Overton, Des Moines, Backache.
- Dr. Edgar V. Allen, Rochester, Minn., Hypertension.
- Dr. Ernest Kelley, Omaha, The More Common Neurologic Conditions.
- Dr. Edwin L. Miller, Kansas City, Mo., How Can We Reduce the Mortality Rate of Acute Appendicitis?

KANSAS

Society News.—The Sedgwick County Medical Society was addressed in Wichita October 3 by Dr. Paul F. Stookey, Kansas City, Mo., on "Staphylococcic Septicemia" and October 17 by Drs. Albert R. Hatcher, Wellington, and Hervey R. Hodson, Wichita, on "Problems in the Management of Carcinoma of the Breast" and "Peritonitis" respectively.—At a meeting of the Cowley County Medical Society in Arkansas City September 28 the speakers were Drs. James S. Hibbard and Vincent L. Scott, Wichita, on "Diagnosis and Treatment of Intestinal Obstructions" and "Convulsions in Infancy and Childhood."—The Northwest Kansas Medical Society was addressed at Norton October 3 by Drs. Daniel V. Conwell, Halstead, on "Migraine"; Lloyd O. E. Peckenschneider, Halstead, "Treatment of Congestive Heart Failure," and James L. Jenson, Colby, "Basal Metabolism."

KENTUCKY

Changes in Health Officers.—Dr. Elmer R. Schnake, Newport, has been appointed health officer of that city.—Dr. George B. Davis, Guilford, Conn., succeeds Dr. Chester R. Markwood, Glasgow, as health officer of Barren County.—Dr. Reuben M. Coblin, Frankfort, has been appointed health officer of Franklin County to succeed the late Dr. Eugen C. Roemele.—Dr. James W. Miller, Greensburg, has resigned as director of the Green County Medical Society to enter private practice.

Society News.—Drs. William W. Nicholson and Harry S. Andrews addressed the Jefferson County Medical Society, Louisville, October 2 on "Sulfapyridine in the Treatment of Pneumonia in Children" and "Acute Pharyngolaryngotracheobronchitis in Children" respectively.—Drs. Carl H. Fortune and David Woolfolk Barrow, Lexington, addressed the Bourbon County Medical Society, Paris, October 19 on "Pituitary Functions" and "Surgical Treatment of Varicose Veins" respectively.—Drs. Catherine Brummett and Albert W. Cowan, Middlesboro, addressed the Bell County Medical Society, Middlesboro, October 13 on "Nutritional Requirements of the Normal Infant" and "The Climacteric and the Use of the Estrogenic Hormone" respectively.

District Meetings.—The sixth and seventh councilor districts of the Kentucky State Medical Association held a joint meeting in Somerset October 26. A symposium on a proposed law to require premarital medical examinations was presented in the afternoon by Dr. Fred W. Caudill, Louisville, and Nicholas W. Klein, Somerset attorney. Speakers on the scientific program were Drs. Harry S. Andrews, Louisville, on "Vitamin Deficiency Diseases of Children"; Arthur B. Barrett, Lexington, "Leukorrhea: Its Differential Diagnosis and Treatment," and John Harvey, Lexington, "Sulfapyridine in the Treatment of Pneumonia."—The Third District Medical Society met with the Christian County Medical Society at Hopkinsville October 17, with the following speakers: Drs. John W. Scott, Lexington, "The Problems of the Neuroses"; John M. Coffman, Owensboro, "Recent Advances in Neuropsychiatry," and Addie M. Lyon, Hopkinsville, superintendent of the Western State Hospital, on the work of the hospital.

MASSACHUSETTS

Annual Meeting on Mental Hygiene.—The Massachusetts Society for Mental Hygiene will hold its annual convention at the Twentieth Century Club, Boston, November 23. The principal speaker will be Dr. George S. Stevenson, New York, medical director of the National Committee for Mental Hygiene, who will discuss "New Vistas for Mental Hygiene."

Society News.—At a meeting of the Harvard Medical Society October 10 Dr. Mercier Fauteux, Montreal, Canada, spoke on "A New Surgical Method to Improve the Blood Supply to the Heart in Coronary Disease."—The Suffolk District Medical Society was addressed in Boston October 25 by Dr. Charles H. Lawrence, Dr. Joseph T. Smith and Nicholas T. Werthessen on "Obesity and Menstrual Disturbance: Endocrine and Endometrial Studies"; Drs. Richard H. Overholt, "Clinical Studies in Primary Malignancy of the Lung"; Siegfried J. Thannhauser, "Xanthomatosis"; Samuel Proger, "Observations on Heart Disease," and Joseph H. Pratt, "Secretin Test of Pancreatic Function."—A symposium on "Pain: Its Significance in Diagnosis and Prognosis" was presented October 10 before the Four County Medical Society, comprising the county societies of Berkshire, Franklin, Hampden and Hampshire, by Drs. Lewis M. Hurxthal, Arthur W. Allen, Joc V. Meigs, Boston, and Foster Kennedy, New York.

MICHIGAN

Society News.—Dr. Stanley Milton Goldhamer, Ann Arbor, discussed "Transfusion and the Blood Bank" before the Washtenaw County Medical Society October 16.—The West Side Medical Society, Detroit, was addressed recently by Dr. John G. Mateer, among others, on "Evolution of Knowledge Regarding Vitamin K and Blood Prothrombin in Relation to Hemorrhage."—At a meeting of the Wayne County Medical Society, Detroit, October 16 Dr. Russell L. Haden, Cleveland, spoke on "Etiology and Diagnosis of Leukemia."—Dr. Harry Bakwin, New York, discussed "Newer Developments in Vitamins" before the Calhoun County Medical Society in Battle Creek October 3.—Dr. Manuel E. Lichtenstein, Chicago, addressed the Van Buren County Medical Society, South Haven, October 10 on "Periapical Phlegmon and Abscess."

NEW JERSEY

State Society Arranges Medical Care for Needy.—The Medical Society of New Jersey has issued for the second year its invitation to any person in the state in need of medical care to communicate with the executive office in Trenton. All requests will be referred to the county medical societies of the counties from which the requests come. The societies will assign physicians to investigate applications and provide care in all cases of genuine need.

Dr. Flexner Retires.—Abraham Flexner, LL.D., director of the Institute for Advanced Study, Princeton, since its establishment in 1930, has resigned on the advice of his physician. Dr. Flexner, now 72 years old, has been prominent in education for many years. He was associated with the Carnegie Foundation for the Advancement of Teaching from 1908 to 1925, serving as secretary the last eight years. Early in this period he made the well known study of medical education at the invitation of the Council on Medical Education of the American Medical Association, which led to basic reforms in the medical schools of the country. The study was published in 1910. From 1925 to 1928 he was director of the division of studies and medical education of the General Education Board. He holds many honorary degrees, among them medical degrees from the universities of Berlin and Brussels. His successor at the Institute for Advanced Study will be Frank Aydelotte, LL.D., president of Swarthmore College, Swarthmore, Pa., since 1921.

NEW YORK

Hospital News.—A new \$100,000 wing was opened at the Buffalo Columbus Hospital, Buffalo, October 23. The new unit now forms the central part of the hospital. It contains three operating rooms, accommodations for twenty private and ten semiprivate patients, and enlarged outpatient quarters in the basement. This is the seventh major addition to the hospital since it was founded in 1908 by Dr. Charles R. Borzilleri.

Project to Discover Hard-of-Hearing Children.—The New York State Commission to Study Facilities for the Care of the Deaf and the Hard of Hearing announces a case-finding project to discover children under 6 years old who have defective hearing. The project will be carried out in Columbia County under the direction of Dr. Marion F. Loew, a member of the staff of the state department of health and of the commission, in cooperation with the county health commissioner, Dr. Louis Van Hoesen, Hudson, and with the health department's divisions of maternity, infancy and child hygiene and communicable diseases.

New York City

Personal.—Dr. Condict W. Cutler Jr. has been elected an alumni trustee of Columbia University, succeeding Dr. Eugene H. Pool.—Dr. John Francis McGrath has been appointed director of gynecology and obstetrics at St. Vincent's Hospital.

Lectures on Venereal Diseases.—The bureau of social hygiene of the department of health has opened its fall program of lectures on venereal disease for physicians and the public. Sessions for physicians are being held Saturday mornings from October 14 to November 26. In addition, an evening meeting was held October 31 and another is scheduled for December 6. Meetings for the public were announced for October 18, November 15 and December 20. In cooperation with this program the section of historical and cultural medicine of the New York Academy of Medicine presented a symposium on syphilis November 8 by Drs. John L. Rice, health commissioner, Herman Goodman and Theodore Rosenthal.

Society News.—Drs. Harry Gold, New York, and Robert Edward Gross, Boston, addressed the New York Heart Association at a scientific session, November 7 on "Studies on the Nature of Digitalis Action" and "Experiences with Surgical Treatment of the Patent Ductus Arteriosus" respectively.—Drs. Francis W. Sovak, New York, and Abraham Shulman, Paterson, N. J., addressed the Bronx Gynecological and Obstetrical Society October 23 on "Operative Treatment of Sterility" and "Pregnancy Following Tubal Implantation" respectively.—Carl R. Moore, Ph.D., Chicago, and Philip E. Smith, Ph.D., addressed the New York Academy of Medicine at its stated meeting November 2 on "Physiology of the Testes and Therapeutic Application of Male Sex Hormones" and "Physiology of the Ovaries" respectively.—Dr. James W. Smith has been elected president of the Alumni Association of the New York University College of Medicine; Drs. Luther B. MacKenzie, vice president, and Phineas Bernstein, secretary.

NORTH CAROLINA

Annual Symposium at Duke.—The sixth annual symposium conducted by Duke University School of Medicine, Durham, October 19-21 was on "Diseases of the Lungs and Thorax." The visiting speakers included Drs. Edward D. Churchill, Maxwell Finland and Frederick T. Lord, Boston; Daniel M. Brumfiel, Saranac Lake, N. Y.; Chester A. Stewart, Minneapolis; Harry A. Bray, Ray Brook, N. Y.; Cameron Haight, Ann Arbor, Mich.; William D. Andrus and Dickinson W. Richards Jr., New York; Isaac A. Bigger, Richmond, Va.; Charles R. Austrian and William F. Riehoff Jr., Baltimore; Stuart W. Harrington, Rochester, Minn.; Daniel C. Elkin, Atlanta, Ga., and Gabriel Tucker, Philadelphia.

Society News.—Dr. Bernard J. Alpers, Philadelphia, gave two lectures before the Guilford and Forsyth county medical societies in Greensboro in September as the first of a series of seminars sponsored by the two societies. His subjects were "Interpretation of Neurologic Signs in Common Neurologic Disorders" and "Diagnosis and Treatment of Common Neurologic Disorders."—Drs. Joseph T. Sullivan and Thomas R. Huffins addressed the Buncombe County Medical Society, Asheville, October 16 on "Traumatic Rupture of Liver and Diaphragm" and "Urologic Anomalies" respectively.—Dr. Hubert B. Haywood, Raleigh, addressed the Hartnett County Medical Society, Dunn, recently on "Medicine at the Crossroads."

OHIO

Personal.—Dr. George Frederick Moench, Mount Victory, has been appointed health officer of Delaware and Delaware County.—Dr. Orlando E. Harvey, superintendent of the District Tuberculosis Hospital, Lima, has resigned, it is reported, and Dr. Edward W. Laboe, Howell, Mich., has been named to succeed him.—Dr. Maurice Lincoln Fisher, Mansfield, has been appointed medical director of tuberculosis work in Richland County. A half mill tax levy to provide funds for the care of indigent tuberculosis patients will become available in January.

Society News.—Dr. Louis H. Newburgh, Ann Arbor, Mich., addressed the Mahoning County Medical Society, Youngstown, October 17 on metabolism. Dr. Jerome Selinger, New York, will speak November 21 on peptic ulcer.—Drs. Raymond S. Rosedale, Canton, and Walter K. Stewart, Youngstown, addressed the Stark County Medical Society at Canton September 21 on "Infections of the Neck" and "Progress in Medical Economics During the Past Year" respectively.—Dr. Camille J. DeLor, Columbus, addressed the Fayette County Medical Society in Washington Court House recently on "Bile Salts in the Treatment of Biliary Diseases."—Dr. Lauren N. Lindenberger, Troy, addressed the Miami County Medical Society, Piqua, recently on "Dermatitis Resulting from Sensitivity to Novocain."—At a meeting of the Marion Academy of Medicine recently the speaker was Dr. Russel G. Means, Columbus, on "New Conceptions of Otitis Media."—Dr. John A. Toomey, Cleveland, addressed the Montgomery County Medical Society, Dayton, October 20 on "Differential Diagnosis of Various Forms of Meningeal Irritations."

OKLAHOMA

Another Medical Supplement.—A twenty-four page medical section in tabloid form was published September 24 by *The Daily Oklahoman*, Oklahoma City, under the supervision of the Oklahoma County Medical Association. Articles of a general medical and health nature carried by-lines, whereas those dealing with specific diseases and therapeutic methods carried merely the by-line "By a Member, Oklahoma County Medical Association."

MEDICAL NEWS

JOUR. A. M. A.
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Personal.—Dr. William C. Tisdal, medical superintendent of the Western Oklahoma Tuberculosis Sanatorium, Clinton, has resigned to resume private practice, it is reported. Dr. Richard M. Adams, health officer of Ada and Pontotoc County, has been appointed health officer of Tulsa. Dr. Adams joined the state board of health in 1935 and has served in various capacities. Dr. Solomon P. Roberts, Nowata, has been appointed health officer of Nowata County.

Society News.—Dr. Edward N. Smith, Oklahoma City, addressed the Garfield County Medical Society, Enid, September 28 on "Care of the Newborn Infant." Dr. David V. Hudson, Tulsa, addressed the Tulsa County Medical Society, Tulsa, October 23 on "The Epidemiology of Venereal Disease." Dr. David W. Gillick addressed the Pottawatomie County Medical Society, Shawnee, October 21 on "Collapse Therapy in the Treatment of Pulmonary Tuberculosis." Dr. George H. Kimball, Oklahoma City, discussed plastic surgery at a meeting of the Woods County Medical Society, Altus, September 25.

OREGON

State Tuberculosis Hospital Dedicated.—The University State Tuberculosis Hospital in Sam Jackson Park, Portland, was dedicated November 1 under the auspices of the state board of control and the state board of higher education with the Oregon Tuberculosis Association cooperating. This is the third unit of Oregon's program of state tuberculosis hospitals and has a capacity of eighty beds. The cost of construction was \$290,909. It will be maintained as a unit of the hospitals and clinics of the University of Oregon Medical School under the direction of Dr. David W. E. Baird Jr., medical director, and Ralf Couch, general superintendent. The major function of the hospital will be to provide surgical treatment for tuberculosis, but an outpatient service will also be maintained.

PENNSYLVANIA

Sixth Institute on Exceptional Child.—The Child Research Clinic of the Woods Schools, Langhorne, held its sixth institute on the exceptional child October 24. The general topic of discussion was "Progress of Scientific Research in the Field of the Exceptional Child," and the speakers included Dr. Russell S. Boles, Philadelphia, who presided at one session; William E. Blatz, Ph.D., director, Institute of Child Study, University of Toronto, Canada, on "What Is an Exceptional Child?" and Dr. Juliette Louise Despert, New York, "Research in the Nursery School."

Philadelphia

Second de Schweinitz Lecture.—Dr. Walter R. Parker, Detroit, will deliver the second de Schweinitz Lecture before the section on ophthalmology of the College of Physicians of Philadelphia November 16. His subject will be "Uveitis with Associated Alopecia Poliosis, Vitiligo and Deafness."

TENNESSEE

Personal.—Dr. Jewell R. Wilson has resigned as superintendent of the Western State Hospital, it is reported. Dr. James E. Dedman, manager of the Veterans Administration Facility, Memphis, has gone on leave of absence and will retire from the service Jan. 31, 1940, when he will have reached the retirement age, it is reported. He has been succeeded at Memphis by Dr. Horace C. Dodge, recently at Fort Bayard, N. M.

Society News.—Dr. Elkin L. Rippey addressed the Nashville Academy of Medicine and Davidson County Medical Society September 19 on "Incidence and Complication of Gastric Ulcer." Drs. Thomas C. Moss and William M. Adams, Jackson, September 25 on "Undulant Fever" and "Indications and Time for Plastic Surgery," respectively. Dr. John G. Fleming, Cincinnati, was the banquet speaker at a meeting of the East Tennessee Medical Association in Greenville October 3. His subject was "Abruptio Placentae." Dr. Cobb Pilcher, Nashville, spoke on "Modern Problems of Neurosurgery." Dr. James B. Black, Murfreesboro, was elected president of the Tennessee Public Health Association at the annual meeting in Nashville October 4.

TEXAS

District Meeting.—The Northwest Texas District Medical Society met at Mineral Wells recently. Guest speakers were Dr. Clifford J. Barborka, Chicago, who presented a paper on "Recent Advances in Nutrition," and Dr. Morton J. Tendler, Memphis, Tenn., a paper prepared by Dr. John L. McGehee, Appendicitis (Appendiceal Peritonitis).

Society News.—Drs. Nathan C. Carpenter and Jack M. Furman, Fort Worth, addressed the Tarrant County Medical Society, Fort Worth, recently on "Treatment of Acute Sprains with Procaine Hydrochloride" and "Management of Gastro-Enteric Hemorrhage" respectively. At a meeting of the Dallas County Medical Society October 12 the speakers were Drs. Cleve C. Nash, on "Surgical Treatment of Hypertension"; Horace E. Duncan, "Rural Sewage Disposal," and G. L. Hacker, "Dental Caries in Children."

Postgraduate Clinic in Fort Worth.—The Tarrant County Medical Society sponsored a medical and surgical clinic in Fort Worth September 26. The speakers were Drs. Warfield M. Firor, associate professor of surgery, Johns Hopkins University School of Medicine, Baltimore; John Zahorsky, professor of pediatrics, St. Louis University School of Medicine; George R. Herrmann, professor of clinical medicine, University of Texas School of Medicine, Galveston, and Meyer Wiener, professor of clinical ophthalmology, Washington University School of Medicine, St. Louis. At the banquet Dr. Edward H. Cary, Dallas, gave an address on socialized medicine.

VERMONT

State Medical Meeting and Election.—The annual meeting of the Vermont State Medical Society, marking the society's one hundred and twenty-fifth anniversary, was held in Burlington October 5-6 under the presidency of Dr. Edwin A. Hyatt, St. Albans. The program included the following addresses: Dr. Angus C. Black, Brattleboro, Urinary Calculi (the vice president's address); Dr. David M. Bosworth, New York, The Damaged Shoulder; Dr. David F. Erdmann, New York, Tumors of the Breast; Dr. Edward W. Archibald, Montreal, Canada, Personal Experiences in the Surgical Treatment of Appendicitis; Dr. Wilhelm Raab, Burlington, Arterial Hypertension of Cerebral Origin; Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, The Quality of Medicine.

A symposium on obstetrics, arranged by Dr. Herbert A. Durfee, Burlington, was presented by Drs. Claud E. Heaton and James P. Marr, New York, and Benjamin F. Clark, St. Johnsbury. Dr. Van Etten was the principal speaker at the annual banquet. Dr. Albert M. Cram, Bridgewater, was chosen president-elect; Dr. Clarence F. Ball, Rutland, was installed as president, and Dr. Benjamin F. Cook, Rutland, was reelected secretary. Next year's meeting will be in Rutland.

WEST VIRGINIA

State Societies to Meet Jointly.—The house of delegates of the Medical Society of Virginia has accepted an invitation from the West Virginia State Medical Association to meet jointly at White Sulphur Springs in 1940.

Society News.—Dr. John O. Rankin, Wheeling, addressed the Central West Virginia Medical Society at Webster Springs recently on "Intra-Articular or Joint Fractures." Dr. Temple S. Fay, Philadelphia, addressed the Ohio County Medical Society, Wheeling, October 6 on "Fundamental Basis of Attack Upon Five Problems in Medicine." Dr. William James Gardner, Cleveland, addressed the society October 20 on "Intracranial Complications of Upper Respiratory Infections."

WISCONSIN

Libraries Merged.—The Milwaukee Academy of Medicine and the Marquette University School of Medicine have consolidated their medical libraries, forming a collection of 34,000 volumes. Dr. Irving S. Cutter, dean of Northwestern University Medical School, Chicago, was the speaker at a ceremony inaugurating the new library October 17. Facilities have been enlarged at the university to receive the academy's library. Dr. Horace Manchester Brown. Henceforth the academy of medicine will hold its meetings at Marquette.

Society News.—Dr. Robert E. McDonald, Milwaukee, addressed the Dodge County Medical Society, Beaver Dam, September 28 on "Toxemias of Late Pregnancy." Drs. Harold E. Marsh and Luther E. Holmgren, Madison, addressed the Oneida-Vilas County Medical Society, Rhineland, September 20 on "Modern Treatment of Pneumonia" and "Transfusion" respectively. Drs. Lowell D. Snorf, Evanston, Ill., and Harry M. Weber, Rochester, Minn., addressed the Rock County Medical Society, Beloit, September 26 on "Functional Disorders of the Gastro-Intestinal Tract" and "Use of X-Ray in Diagnosis of Intestinal Lesions" respectively. A symposium on goiter was presented before the Milwaukee Society of Clinical Surgery October 24 by Drs. Francis D. Murphy, Frederick A. Stratton, Hobart K. B. Allebach and Hans W. Hefke.

FOREIGN

League Against Rheumatism Suspends Activities.—The International League Against Rheumatism announces from its headquarters in Amsterdam that the condition of war prevents continuation of its activities. The bureau is to be closed and all members and officials have been officially discharged from their rights and duties.

Nobel Prize for 1938 Awarded to Dr. Heymans.—Dr. Corneille Heymans, professor of pharmacology and pharmacodynamics at the University of Ghent, Belgium, received the Nobel Prize in physiology and medicine for 1938, awarded at the same time that the 1939 prize went to Dr. Gerhard Domagk of Wuppertal, Germany, who was the discoverer of the curative effects of prontosil (now neoprontosil). Professor Heymans was born in Ghent and took his medical degree at the university in 1920. He joined the research staff of the university after his graduation and became a full professor in 1929. He is also director of the J. F. Heymans Institute of Pharmacology and Therapeutics, continuing the work of his father on the influence of the Arctic regions on respiration, according to an Associated Press dispatch. Dr. Heymans has visited the United States various times, first under research fellowships and in 1929 as a delegate to the International Physiological Congress. In 1934 he delivered the Herter Lectures at New York University and in 1937 the Dunham Lectures at Harvard Medical School.

Government Services

Medical Mission to China

The U. S. Public Health Service at the invitation of the Chinese government has sent three officers to Southwestern China to investigate in cooperation with the Chinese health service the reported occurrence of a malignant disease near the Burma border and determine the menace to the United States incident to its possible spread to Oriental seaports. The officers are Drs. Louis L. Williams Jr. and Hiram J. Bush and Bruce Mayne, Dr.P.H. In addition to determining the nature and extent of the disease or diseases prevalent in the areas they visit, they will inform the Chinese authorities of the results of their survey and advise them as to control measures.

Syphilis Clinics on Wheels

"Clinics on wheels" for treatment of syphilis in four southern areas have recently been provided by the U. S. Public Health Service with funds made available by the Venereal Disease Control Act of 1938. Successful use of a "trailer clinic" in Glynn, Camden and McIntosh counties in Georgia in 1937 led to the development of the traveling clinics. In a second project in North Carolina in 1938 a specially constructed bus was found more satisfactory than a trailer. The new units are all-steel buses finished in black and silver. The interior is divided into sections, one for blood testing and injection of neoarsphenamine and the other for physical examination and administration of bismuth. There are doors on each side of the body. Two gas sterilizers are part of the equipment and there is desk space for the physician and nurse. The new buses will be used in Macon County, Ala.; Phillips and Lee counties, Ark.; Scott County, Mo., and Charleston County, S. C.

Health Service Engineer Retires

Joseph Augustin LePrince, senior sanitary engineer, U. S. Public Health Service, retired September 1 at the legal age limit after twenty-five years of continuous service. Born in England in 1875, Mr. LePrince graduated in civil engineering from Columbia University, New York, and in 1901-1902 he was assistant to Dr. William C. Gorgas, then chief sanitary officer of Havana, Cuba, during the first organized campaign for the eradication of yellow fever and malaria. From 1904 to 1914 he served as health officer of the section taken over by the United States in connection with the construction of the Panama Canal. In March 1914 he was transferred from the Isthmian Canal Commission to the public health service and was attached to the scientific research division until his retirement. During his service he engaged in studies of malaria control and in control projects, demonstrations and investigations. During 1922 he was temporarily assigned to yellow fever control measures along the Mexican border. Since March 1935 he had been consultant in malaria control to the Tennessee Valley Authority. He had been stationed at Memphis, Tenn., for several years.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 16, 1939

The Certification of Deaths During the War

In ordinary conditions of civil life all deaths from violence have to be reported to the coroner, who holds an inquest. The uselessness as well as the difficulty of this procedure for the numerous deaths expected from air raids is evident. Like every other contingency which may arise from the war, this one has been provided for. Special arrangements have been made for the certification of deaths due to war operations. Bodies not claimed by relatives will be taken to mortuaries, which have been prepared, and the clerk to the local council will send to the registrar of deaths a certificate that the death was due to war operations. In the case of serving soldiers or airmen and of certain classes of civilians employed with the armed forces, commanding officers are authorized to issue a certificate. The ordinary procedure will apply to other deaths. A physician who attended a person prior to death should issue an ordinary death certificate and should add the words "war operations" to the particulars of violence. When no physician has been in attendance before death the relatives may request one to inspect the body and issue a certificate, and if he is satisfied that death was due to war operations he may say so. Whether a physician has been in attendance or not, there will be no necessity (as there normally is) to report these deaths to the coroner, and no inquests will be held on them.

Chaoul Therapy in England

In a short distance, low voltage form of roentgen therapy, introduced by Henri Chaoul, of Berlin (*Strahlentherapie* 53:202 [June 29] 1935), and called after him, the tube is so constructed that the anode can be brought within a few centimeters of the lesion and thus their radiation of the tissues is confined to a small area. A tube with the anode at one end for introduction into the vagina in the treatment of carcinoma of the cervix was previously introduced by Schaefer and Witte (*ibid.* 44:283 [June 15] 1932) but Chaoul is chiefly responsible for the development of this procedure for the treatment of carcinoma on the surface of the body. At the Royal Cancer Hospital, London, Chaoul therapy was first used in England in 1935 and in the ensuing years the staff has collaborated in giving it a thorough test. A report on the treatment of 500 cases treated from July 1935 to August 1938 has been published by Flood, Smithers and R. Waldron under the title "Short Distance, Low Voltage X-Ray Therapy" (*Brit. J. Radiol.* 12:426 [July] 1939). The malignant cases included 100 epitheliomas, 100 carcinomas of the breast, chiefly cutaneous recurrences, eighty-two rodent ulcers, seven carcinomas of the rectum, seven malignant melanomas, three carcinomas of the parotid gland and eleven miscellaneous cases. The nonmalignant cases included seventy-nine warts and papillomas, twenty-four pitch warts, ten keloid scars, eleven cases of leukoplakia, eleven nevi, thirteen pigmented moles, nine corns, three cases of lupus, two cases of neurofibromatosis and twenty-five miscellaneous cases.

Encouraging results were obtained in certain cases of epithelioma of the lip, scalp, face, neck, trunk, limbs and mouth, and they were remarkably good cosmetically. In rodent ulcer the results were excellent and when the eyelid was affected the majority of cases could be treated without damage to the eyeball (always a difficulty), which is protected by a contact lens with its outer surface covered with lead introduced under the lids. A recent advance is the adaptation of Chaoul therapy to carcinoma in other situations than the surface of the body. Several cases of carcinoma of the urinary bladder have been

treated by the introduction of the Chaoul tube through a suprapubic cystostomy. One massive dose is given and the wound is closed. The nonmalignant lesions, such as warts and papillomas, disappear with excellent cosmetic results. Good results have also been obtained in the treatment of keloid scars, cavernous nevi and corns.

The following are the chief advantages of the treatment:

1. It is possible to give a large dose and spare the surrounding tissues. This results in rapid healing and good cosmetic results.
2. The high dosage—up to 8,000 roentgens a minute—makes the time of treatment short, usually three or four minutes. Many patients can be treated during a day and their loss of time is minimal. It is also possible to administer large doses under anesthesia when surgical exposure of the lesion is necessary.
3. The method is economical and the running expenses are negligible. The majority of the cases can be treated in the outpatient department with a considerable saving to the hospital.

Danger of Food Contamination by Gas Attacks

The danger of food contamination by gas attacks was discussed at a conference of the food group of the Society of Chemical Industry. Dr. A. P. B. Page, of the Entomological Research Station of the Imperial College, Slough, said that methods were available for the detection and determination of all the known war gases. It seemed that many foodstuffs could be well protected against such gases. It should be possible to decontaminate most foodstuffs affected by vapors but few affected by liquids. Contamination was likely to be severe only on the surface of piles of food; thus big piles would be less affected than small ones.

Annual Meeting of the British Medical Association Canceled

The war has had a profound effect on medical arrangements. Many of the usual fixed events have been countermanded. The annual meeting of the British Medical Association, which was due to take place at Birmingham in the summer of 1940, has been canceled.

PARIS

(From Our Regular Correspondent)

Oct. 4, 1939.

Blood Transfusion During the War

In 1937 Mme. Raba Deutsch de la Meurthe, on the initiative of Dr. A. Tzanck and with the cooperation of the Administration of Public Aid of Paris, founded the Centre de transfusions et de recherches hématologiques. A special building was constructed in the St. Anthony Hospital gardens in Paris and completely furnished. Its purpose is to furnish the necessary blood for all transfusions needed by physicians connected with the hospital services of the city, as well as by physicians in private practice, and to organize well equipped laboratories for the study of blood. The center began to function at once. Carefully chosen donors were recruited and permanent files set up where any physician at any time can quickly find donors and transfusion specialists. The donors were subjected to the usual tests. Blood groups were established and the universal donors kept. A large number of donors were selected and paid. In 1938 more than 8,000 blood transfusions were performed. Tzanck's apparatus was used, a syringe with two openings which permits aspiration of 10 cc. of blood and its immediate forcing into the veins of the patient. The blood is transmitted in complete protection from the air, with no need for citration. With the coming of the war, the center was assigned the task of organizing the blood service for wounded soldiers. The blood quantities required could be supplied only by conserved blood. An appeal, accordingly, was made through the press and radio to voluntary donors. The response was overwhelming. Those selected were given the requisite tests and from 200 to 250 Gm.

of venous blood was taken. A simple apparatus permits oxygenation and citration of the blood; it is poured into ampules that are promptly sealed and placed in refrigeration. Ten thousand goodwill donors of the universal type are expected. This will permit creating a constantly renewable stock of 500 liters of conserved blood, sufficient for all pressing needs, military as well as civilian. Blood shipments are made in specially wrapped packages and can be used two weeks after taking. Blood changes with age. The power of oxygen fixation and corpuscle resistance slowly diminishes, about the tenth to the twelfth day if physiologic solution of sodium chloride is added to the blood, from the thirteenth to the twenty-first day if sodium citrate is added, from the twentieth to the thirtieth day if a citrated dextrose solution is added. The blood groups do not change, nor do the serologic reactions, but the corpuscles do change from the fifteenth day on. The center has rejected the handling of the blood of dead bodies. Dr. Tzanck was commandeered for war service and has organized a sort of branch of the Paris center in the provincial city to which he was assigned. His place in Paris has been taken in the meantime by his associate Professor Sureau.

Absinth

Absinth has been known for its digestive and tonic properties. Galen often mentioned it. However, the word "absinth" today may mean several things. Absinth as a liqueur comes from Switzerland. It is an alcoholic beverage of different essences the majority of which belong to the genus *Artemisia*; that is, large and small absinthium, *Artemisia rupestris* and others. To these are often added Chinese anise (*Illicium verum*), hyssop (*Hyssopus officinalis*) and anise (*Carum pimpinella*). Its recipe has been modified in the course of its expansion in France and in the basin of the Mediterranean and it now contains chiefly anise, or rather anethol.

To a certain quantity of absinth, 1,000 cc. or more, the consumer adds water, which precipitates the essences and causes the solution to become muddy or thick (*louche*), appearing with fifteen measures of water and giving absinth the character of an *apéritif*. This quality of *louche* is demanded by the absinth drinker. An attempt was made to regulate the use of absinth in 1912, and a law was passed prescribing that it contain only 1 Gm. of essence per liter and titrate to not more than 40 per cent alcohol and that it contain no thujone or acetone bodies. Under these conditions it was impossible, with the customary quantities, to obtain the characteristic muddiness unless one also increased the quantities of the liqueur a great deal. The law, therefore, called for only a slight decrease in the quantity of essences absorbed but a great increase in that of alcohol. At the beginning of the World War in 1914 the consumption of absinth was strictly forbidden. But beginning with 1922 it was again authorized in continental France on the basis of the law of 1922, while in Algeria an absinth of 45 per cent alcohol with 2 Gm. of essence per liter was permitted. This absinth permitted the consumer to achieve the desired "muddiness." Fraudulent practices came into use. In southern France powder packages and small bottles of extract under the name of *pastis* were devised. The consumer dissolved them in any kind of alcohol. The powerful taste concealed the impurities, the butyl or amyl alcohols and even the strong flavor of high alcoholic content. Hence, to the harmfulness of toxic essences was added strong and impure alcohol.

A commission appointed by the minister of agriculture, with Professor Tanon, chairman, examined the toxicity of the essence of anise or rather of anethol, which has replaced it. They concluded that it was not harmful in small doses provided it was correctly distilled and contained no thujone. Anethol is a *para*-propylanisol, also called *iso*-estragol and in large doses induces convulsions. The commission admitted that if the use of absinth was to be permitted to continue it would be better to adopt

the regulations of Algeria; that is, to authorize 45 per cent alcohol, provided it was pure, and 2 Gm. of essences. In the Académie de médecine, Professor Vincent had a pledge put to a vote tending to complete suppression of absinth and similar beverages. However, the minister of finance will hardly renounce some six billions annually of revenue from alcohol, though it is collected at the expense of the national health.

Harmfulness of Mineral Dusts

At its last session, the Académie de médecine honored the memory of Harvey Cushing, who was one of its members and whose eulogy will be pronounced at the next meeting. It heard a fine funeral oration on Albert Brault, its recently deceased dean. Among the papers read at this session was that of A. Policard and J. Rollet on the harmfulness of mineral dusts tested by the corneal biomicroscope. There are, according to the authors, great differences among mineral dusts. To determine their harmfulness, subcutaneous injections of fine suspensions followed by local examinations of the tissues were made. Recently, intrapleural injections (Sayers) were practiced—an excellent but slow procedure, since one must wait weeks for the tissue response. The same is true of intrapleural or intratesticular injections. Intravenous injections, the results of which are quite precise, remain a laboratory approach. Artificial dust implantation of animals is not practical. Policard and Rollet conceived the idea of inserting into the thickness of a rabbit's cornea, after incision, an extremely small quantity of dry dust. The next day and the following days the cornea was examined with the aid of the corneal biomicroscope or the ocular microscope with the Süllstrand opening. This is a simple test and allows one to take precise cognizance of the reactions of the corneal parenchyma to the dust inserted. When finely pulverized charcoal is used, the least harmful of the dusts, the first reaction is a local edema. This is followed by a grayish infiltration of a cellular nature having minute punctations and being productive of a corneal disturbance around the mineral deposit. All these symptoms belong as much to the traumatism as to the irritation caused by the strange body and constitute the minimal reactions. In extreme cases, on the contrary, the reaction is violent. The edema appears early, is intense and extensive, may last for several weeks and leaves a cicatrice. Between these two extremes all intermediary degrees are found. The authors studied the toxicity of a whole series of dusts by this method and classified them according to their injuriousness.

BERLIN

(From Our Regular Correspondent)

Sept. 15, 1939.

Effect on Head Wounds of Transportation by Air

Professor Schaltenbrand, a neurologist, reported in *Der Deutsche Militärarzt* observations on transporting soldiers with head wounds by air. Rapid conveyance to special clinics should be done at once. Transportation by air may have serious consequences, but they do not exceed those incurred during long transportation by automobile. Schaltenbrand observed that the increase of atmospheric pressure had no positive effect on cerebral fluid pressure. Increased cerebral fluid pressure may result from incipient oxygen deficiency. Whenever it occurs, several factors are to be considered: (1) augmentation of cerebral fluid secretion in the plexus due to oxygen deficiency, (2) elevation of arterial pressure and (3) elevation of venous pressure. It is of prime importance to know that cerebral fluid pressure rises notably in healthy persons at greater altitude, but probably especially so if anemia through loss of blood or for other reasons is present. The application of these principles to the transportation by air of those with head wounds makes the following considerations mandatory: 1. Higher altitudes ought to be avoided as much as possible. 2. If higher altitudes

cannot be avoided, oxygen is to be supplied the patient in time without waiting until the 3,000 meter limit has been reached. 3. Circulation must be stimulated by strophanthin. The possibility that air may penetrate into the cerebral fluid spaces and cause a tendency of the brain to collapse is much greater than that of oxygen deficiency. Cerebral fluid pressure under conditions of aerial transportation not only varies with low pressure of the outer atmosphere but falls below normal level with atmospheric high pressure. The rise of cerebral fluid pressure in external atmospheric low pressure cannot be remedied with administration of oxygen. This consideration leads to further necessary precautions. 4. Patients with open brain injuries should be placed as horizontally as possible. 5. Wide skull clefts should not be closed before transportation. 6. A roentgen examination should be made before the flight. 7. If the ventricle is filled with air, the plane's ascent and descent should be carefully managed and greater fluctuations of altitude be avoided.

Meeting of the Roentgen Society

The main topics for discussion at this year's meeting of the Deutsche Röntgen Gesellschaft were the following: central x-ray institutes, x-ray tests for cardiac function, dosimetry, short wave therapy, effect of roentgen irradiation on the cells, sterilization by irradiation and x-ray serial tests. Holfelder's paper on the organization of x-ray service in universities and hospitals was occasioned by a similar paper read before this year's congress of German surgeons in which opposition was voiced against the central x-ray institute and the claim of surgeons advanced for x-ray divisions subject to their control. Holfelder pointed out that it was impossible for clinical specialists to be experts also in roentgenology. However, great stress should be laid on a thorough and many sided preparatory training of roentgenologists. Centralized institutes do not aim at monopoly. He admitted that clinicians need their own x-ray apparatus in their clinics for special occasions but also indicated that clinicians should limit themselves to the roentgenology of their special field. Roentgenologists should be trained only in central x-ray institutes. Representatives had been sent to this meeting by large clinical societies to discuss this fundamentally important problem. Schittenhelm, a Munich internist, set forth that the systematic training in the foundations of roentgenology must be given in independent special institutes but that the practical application of the principles acquired should be made in the x-ray divisions of the clinics and hospitals.

High voltage roentgen therapy, however, should be performed largely in independent x-ray institutes. Kirschner, a Heidelberg surgeon, explained that the diagnosis should be done in the individual clinics but that on the whole treatments should be administered in special institutes by roentgenologists. A forcible separation of x-ray diagnosis from the functions of the surgical clinics was out of the question. Besides, larger distances constituted a great disadvantage to the patient, especially in urgent cases. K. Hoede, a Würzburg dermatologist, pointed out that dermatologists had always stood aloof from centralization. In his opinion it was sufficient for a practicing physician who wishes to give his patients roentgen therapy to possess a general knowledge of the other fields of roentgenology. On the other hand, it was not sufficient for a roentgenologist to possess only a superficial knowledge of cutaneous and venereal diseases. The specialist, therefore, should be consulted before and during therapeutic management. He did not doubt that too many skin diseases were treated in x-ray institutes. Dermatologic clinics ought to be included in instruction on roentgen therapy. Holfelder indicated that the desire of roentgenologists for centralized institutes was not motivated by monopolistic intentions to encroach on the activities of the clinicians. The discussions at this meeting may have helped to clarify the situation, for previously roentgenologists had made larger

demands. These discussions bear also on the new medical curriculum requiring students to take a two hour course for one semester in roentgenology.

M. Bürger, a Leipzig clinician, and W. Teschendorf, a Cologne roentgenologist, presented a joint paper on x-ray examinations for cardiac functioning. Bürger set forth that it was better to speak of examinations for circulatory functioning. The examinations were based more or less on the observation of strains on the regulatory mechanism that takes care of an orderly interplay between circulation and respiration. What is observed is arbitrarily induced modification of the size, shape and movement of the heart and its large vessels. The size of the heart is essentially a function of its condition of fullness, a condition which can be influenced by suction (Müller's test) or pressure (Valsalva's test). X-ray examinations of changes in the size of the heart can acquire value for functional tests of the circulation only if all the circulatory conditions and the electrocardiographically perceptible disturbances of cardiac action, if present, are considered.

Reindell, of Freiburg, discussed the effect of sports on the heart, especially that of winners in competitive games. The question whether hearts enlarged by athletic exercises are to be considered as damaged does not receive a uniform answer. He himself denies it, supported by electrocardiographic and kymographic investigations. Neither does he accept the view that the youthful heart inclines more to enlargement than that of the older sportsman. It may be assumed that the heart of the sportsman eliminates its residual blood after strain and thus increases its efficiency.

Rajewski, of Frankfurt-on-the-Main, and Schliephake, of Giessen, discussed short wave therapy. Long wave diathermy, they said, had disappeared almost altogether. The generally used wave length of 3 meters did not yet conform to the best conditions for the "selectivity factor"; 1 meter was more favorable. Also the problem of dosage, he said, might soon be sufficiently clarified. In the biology of high frequency currents attention should be called to the fact that the presence of "specific effects" is not sufficiently proved. In fact, much was still doubtful in this field. The 1 meter wave seemed to possess a superior penetration but was accompanied, as Schliephake pointed out, by certain dangers. Therefore, only specially trained and experienced physicians should employ it.

A. Hintze, a Berlin roentgenologist at the surgical clinic of the university, reported on the results of the use of irradiation on carcinomas. During the years 1912-1925 about 5,000 cancer patients were treated, about 3,400 with roentgen rays or radium. A change has set in; more patients are being therapeutically managed with irradiation or irradiation in combination with surgery than by surgery alone. The majority of permanent cures were effected in patients subjected either exclusively to roentgen therapy or in combination with surgical intervention.

Gauss, of Würzburg, and Pickhan, of Berlin, discussed sterilization by means of irradiation. Originally the German laws on sterilization permitted surgery only. Since February 1936, roentgen rays and radium are allowed under certain conditions. A questionnaire addressed to centers possessing legal authority to sterilize elicited the information that 95 per cent of the patients were operated on and 5 per cent were treated with roentgen rays; of the latter, four fifths received roentgen and one fifth, radium therapy. The results of irradiation, with few exceptions, were entirely satisfactory. Secondary effects were relatively few and insignificant compared with those attending surgery. Impairment of the ability to work, he said, because of roentgen therapy was not demonstrable.

Value as Evidence of Blood Group Determination

At the request of the reich's minister of the interior, the Robert Koch Institute for Infectious Diseases in Berlin has rendered an official expert opinion on the value of blood group

determination as legal evidence (THE JOURNAL, July 2, 1933, p. 72). The report contains the following statements: The evidential value of the blood groups O, A, B and AB and of the M, N and MN characteristics of the blood corpuscles has recently been challenged in different ways. The arguments advanced against the validity of the blood groups are (1) that qualitative changes (mutations) of the genes can occur and (2) that the genes may be hindered in their development so that a structure genotypically present may not receive phenotypic evolution. These objections are answered in the expert opinion as follows: 1. In extensive scientifically performed investigations of heredity and family descent, not a single case of mutation of genes has been established. 2. Factors restrictive of gene development are of no significance for practical purposes. Therefore they offer no scientific basis for limiting the evidential value of the blood groups. The limitations and fallibilities of the methods, the report continues, are sufficiently known to all experts. In all cases in which these methods yield univocal results, the blood group of the individual whose sample has been taken is assured. If the results are equivocal, e. g. defective types or blood samples of the newborn in whom the presence of isobodies cannot be verified, the blood group is not reliably determinable. For that reason, experts must always clearly indicate whether univocal results have been obtained or not.

This judgment of the Robert Koch Institute was based on a questionnaire addressed to experts. All of them agree, on the basis of thousands of observations, that the hereditary transmission of blood group characteristics of A and B and those of the red corpuscles M and N can be safely relied on. If performed according to the regular method, the procedure for the blood groups O, A, B and AB and for the characteristics of the red blood corpuscles M and N can fulfil all legally required conditions. There is no other hereditary characteristic in human beings the hereditary evolution of which has been so fully reexamined and confirmed. The alleged mutability of the blood group of an individual and the deviations from the acknowledged laws of heredity formerly asserted were found to be due to errors of procedure or involved illegitimate offspring.

Only two exceptions exist to the validity of the observations just formulated and to the conclusions to be deduced from them: 1. The possibility of a feeble erythrocytic characteristic N(N₂). Only two cases have been observed in the literature in which the N trait showed too feeble an evolution to permit immediate verification. The Robert Koch Institute has therefore taken the position that the conclusions derived from accepted and correctly performed procedures possess a probability bordering on certainty if the negation of paternity is founded on the absence of N, whereas paternity cannot be denied in the presence of a feeble N(N₂). This probability is exceedingly great because blood samples with feeble N can nowadays be definitely recognized as possessive of a N content, because of the precautions provided. Consequently the two cases mentioned cannot constitute an argument against the reliability of the M and N determinations. 2. Subordinate groups of A (A₁/A₂) and AB (A₁B/A₂B). A high degree of probability attaches to the conclusions derived from observations based on correctly performed procedures of the subordinate blood groups just mentioned. However, statistical material on a large scale is not yet available to permit a categorical statement.

The opinion is summarized in the following words: If paternity can at all be excluded on the basis of blood group examination, all other combinations admit of conclusions that possess absolute certainty, provided the blood group determinations have been made in a scientifically unobjectionable manner.

ITALY

(From Our Regular Correspondent)

Sept. 22, 1939.

Leishmaniasis in Italy

Dr. Pullé, of Riccione, in a lecture before the Società Medico-Chirurgica della Romagna, discussed the clinical forms of leishmaniasis. The insect which transmits leishmaniasis is unknown. Probably various insects which fly during the day may transmit the disease. Rodents are highly receptive but they do not directly transmit the disease.

Professors Monti and Poggi reported on a large focus of cutaneous leishmaniasis which developed at Forlì and was observed by the speakers. In a municipality of the province, sixty cases were found. The twenty patients who had local injections of from 0.05 to 0.1 cc. of atabrine, according to Flarer's technic, recovered. The technic of administration is simple. The leishmaniotic nodules regress in ten or twenty days. The speakers showed photographs, microscopic preparations and photomicrographs. They presented four patients who had had the atabrine treatment.

Professor Bartolotti discussed cutaneous leishmaniasis. The speaker found, by microscopic and bacteriologic studies, that the changes in the epidermis due to *Leishmania* are similar to those in the epithelial cells due to *Microbacterium leprae*. The reticulo-endothelial cells are phagocytic for leishmania.

Professor Gentili reported three cases of visceral leishmaniasis in children. Two patients were natives of the province of Toscana and the other came from the region of Calabria. *Leishmania* was identified in one in the bone marrow which was taken by sternal puncture. In the other the parasite was identified in material taken from puncture of the spleen. The Auricchio-Chieffi reaction gave positive results in all three cases. The speakers found that the euglobulin fraction of the blood proteins was increased. They believe that the positive results of the Auricchio-Chieffi test are associated with the increase of the protein fraction.

Vascularization of Human Testicle

Professor Balice recently lectured to the Accademia delle Scienze Mediche e Chirurgiche, of Naples, on primary tuberculosis of the epididymis and testicle. The speaker recently carried on an x-ray study of the vascularization of the human testicle after having injected a thorium preparation into the spermatic artery. The roentgenograms show that the vascular supply of the testicle is provided by the spermatic artery and its branches, which bifurcate through the testicular parenchyma. The roentgenograms of the epididymis and the body of Highmore show a uniform dark shadow from the blood vessels. It cannot be determined whether the blood vessels originate only in the spermatic artery or in both the artery and blood vessels at the body of Highmore. Blood vessels of decreasing caliber from the body of Highmore to the free surface of the parenchyma can occasionally be seen in the roentgenograms. Probably they originate in central blood vessels. The speaker believes that tubercle bacilli come simultaneously to the epididymis and testicle through the blood. Early in the development of tuberculosis the disease is more acute in the epididymis than in the testicle because of the different blood supply of either structure. Tuberculous orchiepididymitis develops in most cases from the hematogenic route. However, in a few cases tuberculosis may be propagated by a process of continuity from the prostate and seminal vesicles to the epididymis and to the testicle. When this is the case, the primary seat of tuberculous granuloma is intracanalicular. The treatment is conservative, by roentgen irradiation. When the lesion is in the epididymis and the testicle is not involved by tuberculosis, an epididymectomy is indicated, after which the results of roentgen treatment are satisfactory.

Personal

Prof. Galeno Ceccarelli, professor of clinical surgery at the University of Perugia, was transferred to the same position at the University of Padua. Professor Ceccarelli graduated in 1913, after which he was appointed to the chair of surgical pathology at the University of Bari. He has published articles on pathologic histology of primary cancer of the epidermal structure of the gallbladder, pedunculated tumors of the liver and malignant tumors of the testicle. He was awarded a prize by the Concorso Nazionale Zanetti for his method of performing cutaneous transplantations in man. He studied the influence of the endocrine system in the regeneration of the skin and bones and also conducted clinical and experimental work on heterotopic ossification. He has written more than seventy articles on surgery, especially on torsion of the gallbladder and the painful symptoms of stagnation of the gallbladder.

Clinical Courses in Hospitals

New clinical courses in the hospitals of Rome were recently opened. The courses form a part of the university curriculum for physicians. The aim is to give new physicians special practice in clinical diagnosis and treatment of patients. Special attention is given to improvement in making diagnoses, determining proper indications and doses of drugs and other therapeutic procedures.

Marriages

WILLIAM SPEARS RANDALL JR., New Orleans, to Miss Hattie Louise Stapleton of El Paso, Texas, in San Antonio, recently.

RICHARD H. ARIMIZU, Hilo, Hawaii, to Miss Millicent Hume of Alliance, Ohio, in Honolulu, August 30.

COURTLAND PRENTICE GRAY JR., Monroe, La., to Miss Betty Eastland Ormond of Forest, Miss., September 9.

ANNA MAXWELL, North Reading, Mass., to Mr. Jerome A. Morris of Moncton, N. B., Canada, October 3.

JOSEPH BOISLINIERE GRINDON JR., St. Louis, to Miss Mary Ann Murray of Carlyle, Ill., September 27.

WARNER LEE WELLS, Raleigh, N. C., to Miss Rebecca Ann Atzrod of Clarksburg, W. Va., October 7.

MICHAEL J. STIEF, Mount Carmel, Pa., to Miss Margaret Mary Graham of Shenandoah, Pa., July 15.

WILLIAM ERNEST COLEMAN JR., Birmingham, Ala., to Miss Betty Brown of Eastaboga, September 30.

ISAAC EMERSON HARRIS JR. to Miss Mary Elizabeth Teer, both of Durham, N. C., in September.

EDWIN C. GALSTERER, Saginaw, Mich., to Miss Alma Foerster of Holyoke, Mass., September 25.

LEWIS E. ABRAM, Fitzgerald, Ga., to Miss Doris Friedman of Madison, in Athens, September 10.

EARL E. HOUCK JR., Du Bois, Pa., to Miss Katherine Marie Ulrich of Peoria, Ill., September 16.

JAMES MORRIS HIGGINBOTHAM to Miss Sue Dobbins, both of Chattanooga, Tenn., September 6.

LEMUEL PHOTO JAMES JR., James, Ga., to Miss Ila Ellene Walker in Atlanta, September 20.

BENZION C. BARON, Wakefield, Mich., to Miss Marion A. Carter of Crystal Falls, October 8.

HENRY H. MERRELL, Yorkville, Ill., to Mrs. Frank Lincoln Johnson of Chicago, September 9.

DAVID HALE CLEMENT, Boston, to Miss Constance Chambers of Litchfield, Conn., October 7.

JOHN D. FITZGERALD, Roxboro, N. C., to Miss Betty Offerman at Durham, September 5.

RAYMOND JAMES KAY, Wayne, Pa., to Miss Eva P. Welland of Gulph Mills, recently.

LEON E. POLLOCK, Spokane, Wash., to Miss Jean Berry of Portland, Ore., August 13.

REES MORGAN, Roanoke, Va., to Miss Dorothy Hazelwood at Richmond, September 30.

RALPH L. HIGH to Miss Jeanne Price, both of Chicago, September 1.

Deaths

William Battle Malone ☉ Memphis, Tenn.; *Memphis* (Tenn.) Hospital Medical College, 1899; formerly professor of surgery and clinical surgery at the University of Tennessee College of Medicine; past president of the Tennessee State Medical Association, Memphis and Shelby County Medical Society and the American Association of Railway Surgeons; member of the Southern Surgical Association; fellow of the American College of Surgeons; served during the World War; on the staffs of the Methodist Hospital and St. Joseph Hospital; aged 64; died, September 4, of acute hemorrhagic encephalitis.

Bernard Portis ☉ Chicago; Rush Medical College, Chicago, 1921, died suddenly of heart disease November 1, aged 42. Dr. Portis was assistant professor of surgery in the University of Illinois College of Medicine and associate attending surgeon in Michael Reese Hospital. Previous to the heart disease, which proved to be fatal, he had suffered an attack of toxic encephalopathy. Dr. Portis is survived by two brothers who are physicians—Drs. Milton and Sidney A. Portis.

Max Halle, New York; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1898; member of the Medical Society of the State of New York and of the American Academy of Ophthalmology and Otolaryngology; on the staffs of the Broad Street Hospital and the New York Polyclinic Medical School and Hospital; aged 66; was killed, September 5, near New Castle, Del., in an automobile accident.

Newton J. Coker, Canton, Ga.; University of Georgia Medical Department, Augusta, 1893; member of the Medical Association of Georgia; past president of the Cherokee County Medical Society; for many years chairman of the city and county board of education; served during the World War; founder of a hospital bearing his name; aged 71; died, September 11, of coronary occlusion.

Robert Logan Jones, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1898; member of the Tennessee State Medical Association; past president of the Nashville Academy of Medicine and of the Davidson County Medical Society; served during the World War; city bacteriologist; on the staff of the Protestant Hospital; aged 68; died, September 15.

Donald Wallace Porter ☉ New Haven, Conn.; Harvard Medical School, Boston, 1912; clinical professor of pediatrics at Yale University School of Medicine; member of the American Academy of Pediatrics and the New England Pediatric Society; served during the World War; on the staff of the New Haven Hospital; aged 53; died, September 8, of coronary occlusion.

Cornelius D. Mulder, Spring Lake, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1903; member of the Michigan State Medical Society; for many years member of the school board; on the staff of the Hackley Hospital, Muskegon, and the Elizabeth Hatton Memorial Hospital, Grand Haven; aged 65; died, September 6, of metastatic carcinoma.

Walter E. Ward, Owosso, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; member of the Michigan State Medical Society; past president and secretary of the Shiawassee County Medical Society; health officer; aged 78; on the staff of the Memorial Hospital, where he died, September 10, of cerebral hemorrhage.

Harry Clay Smith, Missoula, Mont.; Bellevue Hospital Medical College, New York, 1894; member of the Medical Association of Montana; fellow of the American College of Surgeons; on the staffs of the Northern Pacific Beneficial Association Hospital and St. Patrick Hospital; aged 67; died, September 13, of heart disease.

Benjamin Hook Ritter, McCordsville, Pa.; Western Reserve University Medical Department, Cleveland, 1886; member of the Medical Society of the State of Pennsylvania; for many years on the staff of the Lewiston (Pa.) Hospital; past president of the Juniata County Medical Society; aged 80; died, August 27.

John Alexander Macgregor ☉ London, Ont., Canada; Western University Faculty of Medicine, London, 1892; an Associate Fellow of the American Medical Association; professor emeritus of medicine at his alma mater; fellow of the American College of Physicians; aged 67; died, September 20, of cerebral hemorrhage.

Rees Bynon Rees, Bakersfield, Calif.; University of Maryland School of Medicine, Baltimore, 1900; Harvard Medical School, Boston, 1901; member of the California Medical Association; owner of a hospital bearing his name; aged 71; died, August 19, of coronary embolus, adenoma of the prostate and diabetes mellitus.

James Francis Rice, Watertown, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1902; fellow of the American College of Physicians; past president of the Buffalo Academy of Medicine; on the staffs of the House of the Good Samaritan and the Mercy Hospital; aged 66; died, August 3.

George Wallace Jarman, Princess Anne, Md.; Bellevue Hospital Medical College, New York, 1888; fellow of the American College of Surgeons; director of the Peninsular General Hospital and member of the hospital executive staff; aged 77; died, September 19, of acute myocarditis.

Maurice Isaac Stein ☉ Harrisburg, Pa.; University of Maryland School of Medicine, Baltimore, 1909; past president of the Harrisburg Academy of Medicine; served during the World War; served on the staff of the Harrisburg Hospital in various capacities; aged 52; died, August 15.

Arthur Henry Harms, Knoxville, Ill.; Rush Medical College, Chicago, 1904; member of the Illinois State Medical Society; member of the board of education; aged 58; secretary of the staff of the Galesburg (Ill.) Cottage Hospital, where he died, September 21, of coronary thrombosis.

William Bryan Summerall, Atlanta, Ga.; Tulane University of Louisiana School of Medicine, New Orleans, 1896; veteran of the Spanish-American and World wars; formerly medical superintendent of the Grady Memorial Hospital; aged 74; died, September 5, of heart disease.

Leroy Alton Luce ☉ Boston; Tufts College Medical School, Boston, 1906; member of the American Psychiatric Association and the New England Society of Psychiatry; aged 59; died, September 27, in the West Suburban Hospital, Oak Park, Ill., of carcinoma of the lungs.

Lehnor Alfred McComb ☉ Tulsa, Okla.; Baylor University College of Medicine, Dallas, Texas, 1918; fellow of the American College of Surgeons; on the staff of the Morning-side Hospital and St. John's Hospital; aged 45; died, September 1, of a self-inflicted bullet wound.

John Davis Duckett, Houston, Texas; University of Nashville (Tenn.) Medical Department, 1898; Vanderbilt University School of Medicine, Nashville, 1899; member of the State Medical Association of Texas; aged 73; died, August 31, of congestive heart disease.

Max William Vieweg, Wheeling, W. Va.; University of Maryland School of Medicine, Baltimore, 1917; member of the West Virginia State Medical Association; served during the World War; on the staff of the Ohio Valley General Hospital; aged 55; died, August 13.

Charles Paxton Stackhouse ☉ Sandpoint, Idaho; Medical-Chirurgical College of Philadelphia, 1898; served during the World War; past president and secretary of the Bomer County Medical Society; on the staff of the Graham Hospital; aged 68; died, August 8.

Fred Wells Granger ☉ Surgeon Lieutenant Commander, U. S. Navy, Houston, Texas; Yale University School of Medicine, New Haven, Conn., 1918; entered the Navy in 1919; aged 48; died, August 22, in the Methodist Hospital of suppression of urine.

Richard Stephenson, West Lebanon, Ind.; Barnes Medical College, St. Louis, 1898; member of the Indiana State Medical Association; formerly county health commissioner; aged 72; died, September 1, at Rochester, Minn., of coronary sclerosis.

Burton Roy Miller, Tiffin, Ohio; Ohio Medical University, Columbus, 1897; member of the Ohio State Medical Association; veteran of the Spanish-American War; formerly county coroner; aged 74; died, September 16, of coronary occlusion.

Fred Harrison Schleich, Chicago; Chicago Medical School, 1926; member of the Illinois State Medical Society; on the staff of the Illinois Masonic Hospital; aged 50; died, September 16, of cerebral hemorrhage, arteriosclerosis and hypertension.

Leon Brinkmann, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1887; formerly on the staffs of the Jewish Hospital, Mount Sinai Hospital and St. Agnes Hospital; aged 72; died, August 23.

Beatrice Alma Reed Chatigny, Taunton, Mass.; Tufts College Medical School, Boston, 1913; formerly on the staff of the Taunton State Hospital and the Northampton (Mass.) State Hospital; aged 48; died, August 18.

John Sebring, Bellefonte, Pa.; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of the State of Pennsylvania; on the staff of the Centre County Hospital; aged 68; died, August 11.

Philip Richard Flanagan, Chatham, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; aged 73; veteran of the Spanish-American War; died, August 4.

John Frank Kilroy, Detroit; Detroit Homeopathic College, 1911; member of the Michigan State Medical Society; city physician; aged 59; died, September 9, in the Alexander Blain Hospital of pneumonia.

Siegfried F. Bauer * New York; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1902; aged 60; died, August 30, in Los Angeles, of septic infarction of the lung.

Theodore H. Thordarson, Minneota, Minn.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1897; formerly health officer; aged 74; died, August 2.

Winston W. Barnard, Headland, Ala.; Memphis (Tenn.) Hospital Medical College, 1894; aged 79; died, August 22, in the Moody Hospital, Dothan, of a carbuncle on the neck and chronic myocarditis.

Robert Andrew Jacobsen * Exira, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1894; aged 60; died, September 6, in South Haven, Minn., of myocarditis.

Joseph Jarvis, Riverside, Calif.; Bellevue Hospital Medical College, New York, 1866; Victoria University Medical Department, Coburg, Ont., Canada, 1867; aged 96; died, August 25, of senility.

John Herbert Callen, Oakland, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1890; aged 70; died, August 3, of strangulated inguinal hernia and tuberculosis of the lungs.

Edward von Adelung, Oakland, Calif.; University of California Medical Department, San Francisco, 1892; aged 72; died, August 25, of cerebellopontile angle tumor and cerebral arteriosclerosis.

Charles Frederick Mains, Boston; Harvard Medical School, Boston, 1896; member of the Massachusetts Medical Society; served during the World War; aged 67; died, August 17.

Charles Rudderow Hutcheson * Camden, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1920; aged 43; died, September 22, of a self-inflicted bullet wound.

William Diamond Sweet, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1931; aged 33; on the staff of the Western Hospital, where he died, August 14.

Frank Dunster White * Milford, Mass.; University of Vermont College of Medicine, Burlington, 1897; formerly on the staff of the Milford Hospital; aged 64; died, August 28.

Robert F. Peak, Louisville, Ky.; University of Louisville (Ky.) Medical Department, 1880; also a lawyer; aged 80; died, August 16, of hypertrophy of the prostate and heart disease.

Howard D. Manchester, Peoria, Ill.; Hahnemann Medical College and Hospital, Chicago, 1884; aged 79; died, September 4, in the Methodist Hospital of coronary arteriosclerosis.

William Fraser Bryans, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1890; for many years member of the board of education; aged 78; died, September 28.

Charles Thomas McLean, Hallsville, Ill.; University of Missouri School of Medicine, Columbia, 1879; aged 83; died, September 10, in the Mennonite Hospital, Bloomington.

Ellie H. Putman, Cuero, Texas; University of Tennessee Medical Department, Nashville, Tenn., 1892; health officer; aged 73; died, August 24, in the Lutheran Hospital.

Leslie Lamb, Lorimor, Iowa; Keokuk (Iowa) Medical College, 1896; member of the Iowa State Medical Society; aged 69; died, August 5, in Van Nuys, Calif.

John Joseph Mulvanity, Nashua, N. H.; Tufts College Medical School, Boston, 1913; member of the New Hampshire Medical Society; aged 57; died, August 13.

David Salinger, Chicago; University of Maryland School of Medicine, Baltimore, 1894; aged 80; died, September 17, of cerebral hemorrhage and arteriosclerosis.

Thomas Raymond Dorris, Nanticoke, Pa.; Jefferson Medical College of Philadelphia, 1925; on the staff of the Mercy Hospital; aged 40; died, August 5.

Samuel J. Litz * Chicago; Chicago College of Medicine and Surgery, 1916; for many years member of the board of education; aged 56; died, September 10.

Winfield Benjamin Trickey, Pittsfield, Maine; Medical School of Maine, Portland, 1913; member of the Maine Medical Association; aged 57; died, August 17.

Charles Chester Cottrell * Scotia, Calif.; Cooper Medical College, San Francisco, 1907; chief surgeon to the Scotia Hospital; aged 56; died, August 14.

Albert Lincoln Spanogle, Altoona, Pa.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882; aged 78; died, August 10.

Randall Schuyler, Long Beach, Miss.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877; aged 80; died in August.

Adam Emory Kauffman, Chicago; Rush Medical College, Chicago, 1885; aged 82; died, September 3, in the Presbyterian Hospital of coronary sclerosis.

Ernest Max Sasville, Collinsville, Ill.; Northwestern University Medical School, Chicago, 1902; aged 76; died, August 27, of chronic myocarditis.

Charles Reuben Buck, Columbus, Ohio; Pulte Medical College, Cincinnati, 1902; aged 62; died, September 1, of a self-inflicted bullet wound.

A. R. Lydy, Willard, Ohio; Hahnemann Medical College and Hospital, Chicago, 1883; aged 86; died, September 1, of cerebral hemorrhage.

Berton Mell Bishop, Archer, Fla.; College of Physicians and Surgeons, Baltimore, 1890; aged 70; died, August 22, of organic heart disease.

Lynn Noah Daniel Kunkel, Pittsburg, Calif.; University of California Medical School, San Francisco, 1932; aged 36; died, July 26.

George Thompson Pool, Vader, Wash.; Barnes Medical College, St. Louis, 1893; aged 74; died, August 26, in a hospital at Olympia.

Clarke Eugene Hinman, Syracuse, N. Y.; New York Homeopathic Medical College and Hospital, 1895; aged 80; died, August 27.

Arthur Wellington Ligon, Oxford, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1884; aged 80; died, August 18.

William J. Casteel, Blairsville, Ga.; Tennessee Medical College, Knoxville, 1898; aged 75; died, August 26, of an overdose of amylal.

James W. Clark, Columbus, Ga.; North Carolina Medical College, Davidson, 1906; aged 56; died, August 24, of cerebral hemorrhage.

Julius Schneyer, Philadelphia; Jefferson Medical College of Philadelphia, 1909; aged 64; died, August 8, of coronary thrombosis.

Buchanan Burr, Yarmouthport, Mass.; Harvard Medical School, Boston, 1879; aged 83; died, August 11, of coronary thrombosis.

Henley Abraham Stark, Cleveland; Cornell University Medical College, New York, 1937; aged 26; was drowned, August 12.

Abner William Shultz, Lebanon, Pa.; Jefferson Medical College of Philadelphia, 1870; formerly coroner; aged 93; died, August 19.

Jessie Boggs Stoner, Berlin, Pa.; Woman's Medical College, Chicago, 1889; aged 74; died, August 28, of diabetes mellitus.

Vincent D. Krout, Mechanicsburg, Ohio; Medical College of Ohio, Cincinnati, 1897; aged 70; died in August of angina pectoris.

Frank E. Shepardson, Painesville, Ohio; Indiana Eclectic Medical College, Indianapolis, 1889; aged 77; died, August 22.

Milton Armstrong Griffith, Lintlaw, Sask., Canada; Manitoba Medical College, Winnipeg, 1904; died, August 9.

Peyton H. Calloway, Beckley, W. Va.; Leonard Medical School, Raleigh, N. C., 1901; aged 69; died, August 1.

Henry LeHardy, Chattanooga, Tenn.; Savannah (Ga.) Medical College, 1875; aged 86; died, August 15.

Edward Linwood Emrich, Los Angeles; Rush Medical College, Chicago, 1892; aged 69; died, August 8.

Joseph Clyde Renwick, Warren, Ill.; Rush Medical College, Chicago, 1904; aged 58; died, August 29.

Bureau of Investigation

PEPPLES PEP-YOU-UP

The William Everrette Fraud

William Everrette carried on a piece of mail-order quackery from Philadelphia that has been declared a fraud and debarred from the mails. Everrette used such trade names as "Pepples Co.," "Pepples Pep-You-Up Co." and "W. E. M. E. Medicine Co." Everrette called himself "Doctor" and claimed to have studied "naturopathy" and to have been licensed by the state of New Jersey to practice "naturopathy." The Post Office fraud order, however, brought out that there had been accepted as evidence in this case a letter from the New Jersey Board of Medical Examiners stating that any one who intends to practice naturopathy in New Jersey must secure a license from that board to practice medicine and surgery and that William Everrette was not licensed to practice any branch of medicine and surgery in New Jersey.

The character of the Everrette fraud is shown in two of his advertisements:

SEXUAL VIGOR

For Men and Women

Try Pepples Pep-You-Up, non-injurious; no drugs or dope. The result is pep, power, energy and endurance. Bring back lost pleasures.

And another:

WEAK MEN AND WOMEN TOO

Do you suffer from lost PEP, weakness, piles, kidney, indigestion, nervousness, rheumatic pains, getting up nights. Say good-bye to these conditions. Buy a bottle of W. E. M. E. Herb Tonic. . . . \$1.00 per bottle. Cash with order.

These advertisements, according to the evidence in the case, were placed in "various newspapers."

On July 11, 1938, Hon. W. E. Kelly, Acting Solicitor for the Post Office Department, after a hearing in Washington at which Everrette and his attorney appeared, recommended in a memorandum to the Postmaster General that this fraud be debarred from the mails. The information in this article is based on the facts given in the Solicitor's memorandum and, in part, on material in the files of the Bureau of Investigation of the American Medical Association.

The "treatment"—whether for piles or for lack of "pep"—consisted of a liquid and some tablets. The liquid, according to government chemists, was a solution of epsom salt in water flavored with peppermint, together with some laxative drugs. Yet Everrette claimed in his advertisements that his stuff contained "no drugs." The tablets when analyzed were reported to consist essentially of plant tissue including a bitter and a laxative. Both the tablets and the liquid were reported to contain damiana, which the Council on Pharmacy and Chemistry has described in the "Epitome of the U. S. P. and N. F." (A. M. A. Press) as an "ingredient of nostrums for sexual debility in the male; mildly irritant, but otherwise probably inert."

The government charged that the claims made by Everrette that his "patent medicines" would enable sufferers from "kidney trouble," indigestion, piles, sexual weakness, and so on to "say goodbye to these conditions" were false and fraudulent. Even the physician whom Everrette got to testify in his behalf practically admitted the same thing.

The Post Office Department is not the only government agency that looked into this fraud. As long ago as March 1937 the Federal Trade Commission issued a complaint against Everrette, trading as W. E. & M. E. Medicine Co. The charge was not that the business was a fraud but that the claims made by Everrette were "exaggerated and misleading" and that such claims would cause "diversion of trade from competitors." The Commission's complaint allowed Everrette twenty days in which to file answers to the charge. Four months later (July 1937) the Commission reported that a hearing on the charge would be held in Philadelphia on July 30, 1937. Time passed! Ten months later (May 1938) the Commission declared that a hearing on the same case would be held in Washington, D. C., on May 27, 1938. More time passed! Four months later still (September 1938) the Commission again reported that a hearing on the same charges would be held in Washington on Sept. 28, 1938—more than two months after the Post Office Department had put this piece of mail-order quackery out of business! The

case was not finally settled until September 1939, when the Commission definitely ordered Everrette to cease representing that his "Herb Tonic" purifies the blood, relieves all acute pains, stimulates the sexual organs or system, or does some of the other things claimed for it.

The Post Office Department acted with less circumspection in Everrette's case. It notified him of the charges on April 28, 1938, and on July 14, 1938, his fraud was debarred from the mails.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Go-Gon 7-11.—Helm Co., Benton Harbor, Mich. Composition: Liquid, essentially small amounts of boric acid, zinc sulfate, a calcium compound, phosphates, glycerin and water; tablets, chiefly small proportions of ferrous sulfate and volatile oils (including santal, wintergreen and cubeb) with copaiba, and chalk coating. Fraudulently represented as effective in preventing and curing gonorrhea, discharges from urethra and bladder, and urinary complaints in general.—[N. J. 29444; February 1939.]

Minnequa Water.—Minnequa Springs, Canton, Pa. Composition: A lightly mineralized water of the bicarbonate type. Fraudulently represented as an effective treatment for impaired tissues, acid dyspepsia, constipation, gallstones, gravel, gout, diabetes, skin eruptions, rheumatism, neuritis, obesity, etc.—[N. J. 29262; December 1938.]

Ranol's (Dr.) Indian Black Tablets.—Suter Chemical Co., Altoona, Pa. Composition: Essentially methenamine, saltpeter, oil of juniper and plant drugs including buchu, bearberry, podophyllum and an emodin-bearing drug. Fraudulently represented to be effective for kidney and bladder disorders, etc.—[N. J. 29431; February 1939.]

Ranol's (Dr.) Indian Herb Tablets.—Suter Chemical Co., Altoona, Pa. Composition: Essentially aloe, podophyllum, gentian and red pepper. Fraudulently represented as an effective remedy for stomach, blood and liver disorders, sick headache, etc.—[N. J. 29431; February 1939.]

Sanettes (Mentholated Kerchiefs).—San-Nap-Pak Mfg. Co., Wheelwright, Mass. Composition: Tissue paper impregnated with menthol. Claims that it was "Useful during . . . hay fever and sinus irritations" and "Aids in clearing congested air passage" were declared fraudulent.—[N. J. 29258; December 1938.]

Saxon Blackberry Cordial Compound.—Saxon Co., Duquesne, Pa., and Cleveland, Ohio, and Royal Mfg. Co., Duquesne. Composition: Essentially water, sugar, glycerin and alcohol, with small amounts of salicylic acid and plant extracts, including ginger. Fraudulently represented as a remedy "For Diarrhea, Summer Complaint, Cholera Morbus, Cramps, Colic and similar complaints."—[N. J. 29270; December 1938.]

Shapley's Liniment.—Shapley Drug Co., Inc., Decatur, Ill. Composition: Essentially common salt with small proportions of ammonia and ammonium salts, and extracts of plant drugs, with camphor and water. Fraudulently represented as effective in rheumatism, neuralgia, neuritis, croup, etc.—[N. J. 29433; February 1939.]

Shapley's Stimulating Pills.—Shapley Drug Co., Inc., Decatur, Ill. Composition: Essentially plant drug extracts including a bitter, coated with baking soda and dextrose, and colored green. Fraudulently represented to stimulate the kidneys and bladder and to help backache, rheumatic pains, uric acid, gout, scanty urine, etc.—[N. J. 29433; February 1939.]

Shapley's Unguentum Camphoratum.—Shapley Drug Co., Inc., Decatur, Ill. Composition: Essentially a small amount of volatile oils including camphor, menthol and possibly eucalyptol, in a base chiefly of petrolatum and a small amount of paraffin. Fraudulently represented as a treatment for catarrh, hay fever, carache, influenza, neuralgia, tonsillitis, etc.—[N. J. 29433; February 1939.]

Trox Tablets.—Oxol Laboratories, Denver. Composition: Essentially charcoal, starch, magnesium carbonate, extracts of plant materials including saponins, and a small amount of oxyquinoline sulfate. Effectiveness as a treatment for urinary infections, cystitis, prostatic and venereal disorders was fraudulently represented.—[N. J. 29259; December 1938.]

Ward's Anti-Pain Remedy.—Dr. Ward's Medical Co., Winona, Minn. Composition: Essentially a small amount of volatile oils (including wintergreen, sassafras and mustard), with alcohol and water. Fraudulently represented as an effective treatment of lame back, rheumatism, neuralgia and lumbago.—[N. J. 29450; February 1939.]

Ward's Cough Syrup.—Dr. Ward's Medical Co., Winona, Minn. Composition: Essentially alcohol, ammonium chloride, chloroform and tarry material, with a small amount of plant extracts and aromatics. Fraudulently represented as effective in treating "certain disorders and diseases of the bronchial tubes and lungs, coughs, spasmodic croup, bronchitis, coughs, sore throat, pleuritic coughs, whooping cough, la grippe, croup, hoarseness, and kindred ills affecting the lungs and bronchial tubes, bronchitis, pleurisy, throat disorders and croup."—[N. J. 29450; February 1939.]

Correspondence

STANDARDIZATION OF BLOOD PRESSURE READINGS

To the Editor:—The report of the Committees for the standardization of Blood Pressure Readings appointed by the American Heart Association and by the Cardiac Society of Great Britain and Ireland recently appeared in *THE JOURNAL* (July 22, p. 294). The recommendations embodied in the report are excellent except for those of the American committee relative to diastolic pressure readings. The committees agree that "with continued deflation of the cuff, the point at which the sounds suddenly become dull and muffled should be known as the diastolic pressure." However, the American committee recommends that "if there is a difference between that point and the level at which the sounds completely disappear . . . the latter reading should be regarded also as the diastolic pressure." The British committee, on the other hand, "believes that except in aortic regurgitation it is nearly always possible to decide the point at which the change comes and this is the only reading that should be recorded."

From the physiologic point of view there is much to substantiate the British and little to support the American opinion in this matter. Ordinarily, of course, the difference between the diastolic readings obtained by using the sudden muffling of the sounds and the disappearance of the sounds is not more than from 5 to 10 mm. of mercury. However, in an occasional individual the sounds persist even to the 0 level and thus in the report the American committee recommends the recording of a blood pressure of 140/70-0. A diastolic pressure of 0 is possible only theoretically with a completely rigid vascular tree.

Recent studies have shown that there is reasonably close agreement between diastolic readings obtained in man by direct methods and by the indirect method of employing the appearance of the muffled sounds (*Ztschr. f. d. ges. Exper. Med.* 79:569, 1931; *THE JOURNAL*, Sept. 12, 1936, p. 853).

The diastolic pressure is considered to be the minimum pressure in an artery at the end of ventricular diastole. Only confusion can result from assigning two values to a single pressure level. In our courses in physiology for medical students we have for years discouraged the use of the disappearance of all sounds as a criterion for the diastolic pressure level and will continue to do so.

GEORGE E. WAKERLIN, M.D., Ph.D., Chicago.

Professor of Physiology and Head of the
Department of Physiology, University of
Illinois College of Medicine.

BIOGRAPHY OF DR. HARVEY CUSHING

To the Editor:—Mrs. Cushing has requested me to prepare a biography of her husband, and I should be most grateful to any one who wishes to make letters, anecdotes or other memorabilia available.

Copies of all letters, no matter how brief, are desired, and if dates are omitted it is hoped that, when possible, these may be supplied (e. g., from the postmark). If original letters or other documents are submitted, they will be copied and returned promptly.

A new medical library building is being erected at Yale University School of Medicine to receive Dr. Cushing's library and collections, including his letters, diaries and manuscripts. Any of his friends who wish, now or later, to present correspondence, photographs or other memorabilia for permanent preservation among the Cushing papers will receive the appreciative thanks of the university.

JOHN F. FULTON, M.D.,

333 Cedar Street, New Haven, Conn.
Yale University School of Medicine.

SILK IN SURGERY

To the Editor:—Your editorial in the October 7 issue of *THE JOURNAL* "The Renaissance of Silk in Surgery" is apropos, as silk for suturing has been relegated into disuse for too long a time. Some fifteen or eighteen years ago, in line with the current fashion, I began to employ clips in the closure of mastoid wounds. The results were not always satisfactory because of secondary infections. I decided that too much tension by the clips on the edges of the wound was responsible for necrosis of the tissue with the resulting difficulties; although these were not productive of actual bad results as to eventual union, the healing was delayed. Then I turned to catgut—plain or chromicized—with practically the same difficulties. For the past six years I have used silk in place of clips or catgut and, making sure that not too great tension on the sutures is exerted, I have not been bothered with any secondary necrosis and secondary infection. Your editorial remarks are directed particularly toward silk as opposed to catgut, but I would extend that opposition to include metal clips.

PHILIP FRANK, M.D., Schenectady, N. Y.

ILLEGITIMACY IN THE UNITED STATES

To the Editor:—May I express to you my deep appreciation of the editorial on illegitimacy in the United States, which appeared in *THE JOURNAL* September 30, page 1329.

We in New Jersey are engaged in the administration of a law which became operative Jan. 1, 1939, for a better control of the adoption situation, especially in relation to good social practice.

Previous to Jan. 1, 1939, adoption practice was most informal, easily commercialized and with no guaranty whatever that the child, the child's mother and the adopting parents were protected in any way.

No longer may individuals place children for adoption without subsequent review, on order of the court, of all the factors involved; this department and incorporated social agencies, qualified to serve children, are the instrumentalities to be used by the court in the necessary investigations which shall insure to the three parties concerned that their best interests are protected.

In addition, provision is made to protect the confidential nature of such transactions. We believe that we shall have informative material available in regard to this whole matter which may be useful in the future handling of the problem.

ELLEN C. POTTER, M.D., Trenton, N. J.

Director of Medicine, Department
of Institutions and Agencies.

DIFFICULTIES IN EVALUATING AN INSULIN PREPARATION

To the Editor:—The efficiency of a new insulin preparation is determined by its effect on the sugar metabolism of a diabetic patient who is receiving suitable quantities of food. Judgment is rendered difficult by unexplained variations in sugar excretion, though every effort has been made to control insulin dosage, diet, physical and mental activities and the like. It is probable that this annoying irregularity is occasioned by unknown limiting factors that are necessary for insulin activity. The profession is distressingly ignorant of this phase of carbohydrate metabolism, and it is to be hoped that further work by biochemists and physiologists will elucidate this question.

Another disturbing factor, more amenable to correction, is the lack of agreement among writers as to what constitutes acceptable regulation of the diabetic patient. A committee of men especially interested in diabetes might undertake to dispose of this problem.

LOUIS BAUMAN, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CANCER OF LUNGS

To the Editor:—The condition of my father, who is 62 years old, was diagnosed bronchial carcinoma of the squamous cell type (primary) in December 1938. Diagnosis was made by biopsy. Prior to that time he had a nonproductive cough for five months, some loss of weight and slight general debility. In January 1939 roentgen treatment was started over the upper right part of the chest, the site of the lesion. Each day he received 200 roentgens over the anterior and posterior portions of the chest. A total of 8,000 roentgens was given. Coughing was much less and generally he felt better as well as gaining several pounds. Seven months after conclusion of the first roentgen treatment, coughing became more pronounced and general debility more marked. An x-ray examination of the chest revealed an atelectatic area in the lower part of the right lung, involving most of the middle lobe and a small amount of the lower lobe. This of course was thought to be due to extension rather than possible damage by former roentgen treatment. Treatment was started over the new area, 200 roentgens anteriorly and posteriorly daily, a dose of 8,000 roentgens being contemplated. All treatment has been given at 200 kilovolts. There has been no reduction of the cough since treatment has been started and some nausea has been experienced. Will you please advise me what other treatment might help. Do you consider the roentgen treatment adequate? If not, please advise me as to the dosage and amount. I would also appreciate your comment on the expectancy of life.

M.D., Texas.

ANSWER.—The events described in this case are fairly typical of the results usually obtained in the roentgen treatment of cancer of the lungs. The treatment resulted in some degree of palliation, followed by recurrence. The second course therapy was less efficacious. This holds true for a second irradiation not only of cancer of the lungs but of other lesions as well. In all probability further roentgen or radium treatment would not be of value.

The prognosis of cancer of the lungs is somewhat as follows: One third of the patients die within three months, one third within six months and the other third within twelve to eighteen months.

INGESTION OF POTASSIUM PERMANGANATE

To the Editor:—Please give me what information you can on the ingestion of potassium permanganate. My inquiry is instigated by the discovery that a considerable number of men have been using potassium permanganate over a period of time going back several years in the self treatment of acute coryza and boils. For both conditions they claim that the material taken as a one-tenth molecular solution, one teaspoonful three times a day in a glass of water, is unusually efficacious. I shall appreciate any information you can give me on this subject.

H. H. Gay, M.D., Midland, Mich.

ANSWER.—Whatever action potassium permanganate has is due largely to its ability as an oxidizing agent, provided it is present in adequate quantities. Solutions of potassium permanganate have been used for destruction of morphine or strychnine, provided the poison is still in the stomach; but it should not be employed to the exclusion of gastric lavage. One thousand cc. (1 quart) of a 1:2,000 solution is used to wash the stomach, and it must be evacuated after a few minutes. It usually is of little value when the stomach contains much organic matter, but morphine and physostigmine are decomposed readily even in the presence of organic matter. In snake bite permanganate may be used to wash the incised wound and also to inject immediately around it, but little or none of the permanganate diffuses through the tissue, and it has no effect on any poison that has been absorbed. Potassium permanganate is a deodorant, germicide, irritant and astringent. It is used on mucous membranes, especially of the urethra, in dilutions of from 1:5,000 to 1:1,000. It has been used to disinfect the hands in surgery. The hand is dipped into the disinfectant solution until it is mahogany brown and then dipped into a warm saturated solution of oxalic acid and rinsed in sterile water. Solution of 1:500 is applied externally for excessive sweating of the feet (Useful Drugs). There are no indications other than those already given for the oral administration of the product. It is difficult to believe that it would be of any use for treatment in coryza or cutaneous abscesses. Potassium permanganate naturally reacts to the contents of the stomach, forming manganese compounds such as manganese oxide and possibly manganese chloride. Of late years it has been pointed out particularly that manganese as a metal is a dangerous substance, especially when it enters the

body in the form of dust by inhalation. When a workroom or mine contains as much as 2 mg. of manganese dioxide per cubic foot of air, severe poisoning may arise after long exposure. Lately there has come into prominence in some European countries a form of pneumonia attributed to manganese. This arises solely in towns or cities harboring manganese industries. However, persons not employed in the manganese industries apparently readily acquire the disease, owing to manganese dusts discharged into the general atmosphere. Low quantities of manganese have produced this form of pneumonia in experimental animals. While there is no proof that the oral intake of manganese will induce this condition, it seems likely that this substance will in the future be regarded as more dangerous than heretofore. Manganese pneumonia is well described in the "Proceedings and Papers of the Eighth International Congress for Industrial Medicine and Occupational Diseases" held in Frankfurt on the Main Sept. 26-30, 1938 (Leipzig, Georg Thieme, 1939) through three contributions, as follows:

1. Beobachtungen über Manganpneumonien, by Dr. D. Elstidt, O-ls, 2: 1014.
2. Die Manganpneumonie, by Prof. Dr. H. E. Böttner, Gortitz, 2: 1022.
3. Experimentelles zur Thomasschlackenstaub und Manganpneumonie, by Prof. Dr. K. W. Jotten und Dozent Dr. H. Reploh, Münster, 2: 1028.

SANOCRYSYN AND DREYER'S ANTIGEN IN TUBERCULOSIS

To the Editor:—Please give the merits and demerits of treatment of tuberculosis by sanocrysin and Dreyer's defatted antigen. M.D., Arizona.

ANSWER.—Since Möllgaard published the results of his study of sanocrysin and claimed its specifically curative effect in tuberculosis, the drug has been tried on patients by many investigators. There is no uniform opinion as to its place as a therapeutic agent. The predominant opinion in this country is that the drug is of little use.

Investigation has shown that the action of sanocrysin is due to stimulation of the natural defenses of the body and is not bactericidal, as proposed by Möllgaard. The cases most favorably affected are the acute or subacute types. Because it is difficult to determine the type that will react unfavorably, the treatment must be started with small doses and be increased according to the patient's tolerance. It has been found that patients with fibroid lesions are not benefited by the drug. Bronchopneumonic lesions pursuing an acutely progressive course are harmed by sanocrysin.

Various disturbing reactions have been observed in a large proportion of cases during the treatment which indicate that sanocrysin is not a safe remedy. The complications encountered are chiefly those of heavy metal poisoning. Vomiting and hiccups difficult to control may occur soon after the injection. Persistent high fever, gastric derangement, diarrhea and cutaneous eruptions have been frequently observed. Albuminuria, hematuria and symptoms of shock and collapse have been noted. There is strong evidence that sanocrysin affected unfavorably the trend of the disease and that it exerted harmful systemic effects because of its toxicity.

Dreyer in 1923 announced a diaplyte vaccine produced by treating killed tubercle bacilli with solution of formaldehyde and acetone. His work was based on slight experimental evidence. It has been shown to be capable of stirring up tissue reactions which resulted in active tubercle formation with caseation. Any supposed benefits were limited to a short period of time.

EPISCLERITIS PERIODICA FUGAX

To the Editor:—For many years a patient has had episcleritis periodica fugax. She has had numerous treatments, including opening of the sinuses, removal of the teeth, appendectomy, hysterectomy, tuberculin injections, allergy elimination diets, autogenous vaccines from the nose, sulfonamide, gynergen and protein shock therapy and many examinations including x-ray examinations of the chest and gastrointestinal tract, determination of the basal metabolic rate, sugar tolerance tests and the like. No cause has ever been discovered, nor has there been any favorable effect on the disease. Now the patient is desperate. Have you any suggestion? M.D., Louisiana.

ANSWER.—The best description of episcleritis periodica fugax is to be found in the second volume of Duke-Elder's Textbook of Ophthalmology of 1938. There is considerable space devoted to the discussion of the etiology of the condition and the author concludes with the following sentence: "The only treatment of value is systemic treatment, for local treatment is usually quite without effect." The one phase of etiology not sufficiently emphasized is that of a tuberculous allergy, which is apparently the cause in many cases. Long continued courses of tuberculin for desensitization have proved to be curative in some cases.

PNEUMOPERITONEUM FOR TUBERCULOUS ADHESIONS

To the Editor:—Will you kindly tell me the status of air inflation treatment done repeatedly in the hope of releasing abdominal adhesions from an old tuberculous peritonitis? How and when should it be done? Is there any proof of relief of obstructive symptoms?

Elizabeth Ford Love, M.D., Moorestown, N. J.

ANSWER.—The introduction of air into the peritoneal cavity, known as pneumoperitoneum, has been used for approximately a third of a century. It was originally employed primarily in the treatment of tuberculous peritonitis, since there was a belief that this condition was frequently brought under control by allowing air to enter the peritoneal cavity during laparotomy. It has also been used rather extensively in the treatment of intestinal tuberculosis.

Pneumoperitoneum is frequently instituted in an attempt to elevate and partially immobilize the diaphragm, the thought being to bring about partial rest of the diseased lung, as is believed to occur during pregnancy. It is also used in various diagnostic procedures. Probably pneumoperitoneum is valuable in the prevention of adhesions while tuberculous peritonitis is being brought under control, but it is extremely doubtful whether it is of any value in releasing abdominal adhesions from an old tuberculous peritonitis. The only possibility would be that it might change the position of abdominal organs, particularly parts of the intestine, to relieve the obstructive symptoms partially. If such symptoms are severe, however, one should not rely on pneumoperitoneum but should resort to surgical methods. There is one danger that should be kept in mind constantly when one attempts to introduce air into the peritoneal cavity, and it is particularly great if adhesions are present; it is the introduction of the air into a blood vessel. Patients have died almost instantly from air embolism while pneumoperitoneum was being attempted. To determine just when the needle is in free peritoneal space is more difficult than in the case of the pleural space, on account of the high negative pressure in the latter. When pneumoperitoneum is to be instituted, an ordinary artificial pneumothorax needle or instrument may be introduced approximately an inch to the right or left and one-half inch below the umbilicus. This area usually avoids the penetration of large blood vessels in the abdominal wall. When one is certain that the needle is in the peritoneal space, air may be introduced by the ordinary artificial pneumothorax equipment. Usually from 300 to 500 cc. suffices for each treatment. Percussion over the liver while the treatment is being instituted will usually result in a change from a flat to a somewhat resonant note if the air is reaching the peritoneal cavity.

GASTRIC CARCINOMA

To the Editor:—Of all gastric carcinomas, how many occur above the pyloric area? What is the usual type that occurs in the upper section of the stomach? Is there an accepted "classic symptomatology" of upper gastric carcinoma? What percentage of surgical cures has been reported?

M.D., Indiana.

ANSWER.—The incidence of gastric carcinoma above the antrum has been found to be about 50 per cent in many large series of surgically resected and postmortem specimens. When the lesser curvature is included, the figure rises to about 75 per cent. Some authors, among them Konjetzny, believe that many carcinomas of the lesser curvature are often carcinomas of the antrum with secondary extension along the lesser curvature. Konjetzny (*Der Magenkrebs*, Stuttgart, Ferdinand Enke, 1938, p. 158) in a series of resected specimens found only 18 per cent of the carcinomas to have arisen above the antrum.

Gastric carcinoma rarely causes characteristic early symptoms. Those above the antrum are no exception. Symptoms are often insignificant even when the lesion has progressed beyond the resectable stage. This is especially true of carcinoma of the fundus. On the other hand, carcinoma of the cardia may give relatively early symptoms of esophageal obstruction, but because of its surgical inaccessibility the earlier diagnosis leaves the poor prognosis unaltered. Later symptoms are usually not characteristic of the region of the stomach involved.

A variety of pathologic types of gastric carcinoma occur above the antrum and will be discussed together with surgical cures.

Surgical cures reported amount to from 1 to 5 per cent of all gastric carcinoma seen in large clinics. This figure, however, is misleading in an individual case, because in cases in which the lesion can be resected Balfour (*Surg., Gynec. & Obst.* 54:312 [Feb., No. 2A] 1932) reports 20 per cent to be ten year cures. Carcinomas above the antrum include those with the best and also those with the poorest prospect of surgical cure. As a group, carcinomas of the body and greater

curvature (from 10 to 15 per cent of all gastric carcinomas) offer the best hope for surgical cure. The borders are usually sharply demarcated, metastases are relatively late, and they are surgically accessible. Malignant linitis plastica or carcinoma fibrosum, found in less than 2 per cent of Minnes and Geschickter's series of 541 cases (*Am. J. Cancer* 27:740 [Aug.] 1936), is seldom cured. At operation it is difficult to differentiate involved from uninvolved areas, and even when a wide resection is done considerable carcinomatous tissue remains behind. Carcinoma of the cardia and fundus have poor prospects for surgical cure. Those of the lesser curvature are intermediate in the possibility of a cure, depending on the proximity to the cardia on one hand and the involvement of neighboring structures on the other. Carcinoma in this location metastasizes and invades adjacent organs relatively early.

PROBABLE ACUTE ULCUS VULVAE

To the Editor:—Thirteen months ago small blisters began to develop on the vulva of a girl aged 9 years. These lesions appeared at intervals of from seven to fourteen days and required from three to ten days to heal. I first saw the child four months ago. At that time the mucous membrane of the vulva appeared thin, and there were two or three tiny cracks near the clitoris. On the right labium majus there was a blister 1.5 by 1 cm. This was filled with a serosanguineous fluid. The mucous membrane over the blister broke after a few hours, leaving a shallow denuded area. This gave the child no discomfort, except on voiding, when the urine caused considerable burning and pain. The Wassermann reaction was negative; examination of the stool was negative for parasites. The child's weight was 77 pounds (35 kg.), which is 10 pounds (4.5 kg.) above the average for her age and height. The vaginal smear is negative for gonorrhea, for *Trichomonas vaginalis* and for monilia. Examination of the urine was negative for sugar on the first three examinations. On several occasions since, however, a trace of sugar has been found. This can be controlled by moderate limitation of carbohydrates. Treatment has been unsuccessful. She was given estrogenic substance as a suppository and has had local treatments with gentian violet, silver nitrate and silver picrate to no avail. I would appreciate any suggestions as to diagnosis and treatment.

M.D., Alabama.

ANSWER.—The blisters in this case may represent retention cysts of the sweat or sebaceous glands about the vulva, or they may be herpes genitalis. The latter has a tendency to recur and is usually located on the labia minora. Trauma such as from masturbation must be ruled out, particularly because of the presence of the tiny cracks near the clitoris. The most likely diagnosis, however, is *ulcus vulvae acutum*, first described by Lipschütz in 1913. The blisters in the present case may represent a prodromal stage of this disease. Wien and Perlstein (*THE JOURNAL*, Feb. 6, 1932, p. 461), who reported one of the first American cases, point out that the disease is characterized by the presence of ulcers which appear suddenly in the mucous membrane of the vulva or adjacent region in which *Bacillus crassus* is constantly found. This organism is apparently identical with Döderlein's vaginal bacillus. The lesions involute spontaneously after varying lengths of time with slight or no scar formation, depending on the depth of ulceration.

In the case reported by Wien and Perlstein, the lesions occurred in definite cycles directly related to the physical condition of the patient. Fatigue, nervous exhaustion and mild infections of the upper respiratory tract predisposed to the occurrence of the lesions.

The treatment is usually simple. The lesions heal quickly when treated with mild antiseptic washes or compresses. The persistent application of aluminum acetate packs to the vulva daily for a month will usually give permanent relief. Attention should also be paid to the patient's general physical condition, her diet, her periods of rest and her environment.

ARGYLL ROBERTSON PUPIL

To the Editor:—Is it possible to dilate a true syphilitic Argyll Robertson pupil adequately with a cycloplegic? Will the pupil return to normal after the patient has been cured by antisyphilitic treatment. If so, why?

Robert Emmet Jameson, M.D., Davenport, Iowa.

ANSWER.—In the article by Merritt and Moore (*The Argyll Robertson Pupil: An Anatomic-Physiologic Explanation of the Phenomenon, with a Survey of Its Occurrence in Neurosyphilis*, *Arch. Neurol. & Psychiat.* 30:357 [Aug.] 1933) is quoted the original description by Argyll Robertson of the pupillary phenomenon which bears his name. In the quotation appears this statement: "Strong solutions of atropine only induced a medium dilatation of the pupil." The imperfect dilatation of the Argyll Robertson pupil in response to installations with cycloplegics is characteristic of paralysis in the sympathetic innervation of the eye.

There are scattered reports of the return to normal of true Argyll Robertson pupils after artificial fever therapy in syphilis

of the central nervous system but, so far as is known, not after other forms of antisyphilitic treatment. Why the Argyll Robertson pupil should return to normal under such circumstances or indeed under any other circumstances is not known, since the exact mechanism of its production is also unknown.

SUSPECTED CERVICAL CARCINOMA AND BIOPSY

To the Editor:—What are the dangers in taking a biopsy with a cautery or knife in a case of tumor of the cervix which is probably malignant? My situation up here is such that with present facilities I am not able to do a microscopic section and all specimens are sent to the States. In a case of cancer would this tend to spread it, and if so is the danger great enough to warrant sending the patient out or doing a total hysterectomy rather than taking a biopsy and waiting a month? What would be the best way to make a biopsy to prevent spread? Would a loop on a diathermy be better than a cautery and how much better is that than a knife? Is it true that after cautery the lymph flow is to the wound and that after the knife it is away from the wound? What is the danger of dilating the cervical canal in the presence of a possible malignant growth in order to see it better?

David Hoehn, M.D., Fairbanks, Alaska.

ANSWER.—There is no definite evidence that there is danger in performing a biopsy on a carcinoma of the cervix with a sharp scalpel or cautery, provided the procedure is executed carefully. The danger of spreading the disease after biopsy in relation to the time interval between biopsy and therapy is a controversial question. On the whole, experience indicates that it is best to execute the therapeutic procedure as soon after the biopsy as possible. In mentioning the question of hysterectomy it is assumed that there are no facilities for irradiation available. As to the choice of waiting a month or performing a hysterectomy, a decision must naturally be made in each individual case. This would depend on the clinical examinations. In doubtful cases, waiting is certainly preferable. A diathermy loop is an excellent way of performing biopsy for suspected carcinoma of the cervix. A knife is perfectly satisfactory if the procedure is executed carefully. There is no acceptable evidence that after the use of cautery the lymph flow is to the wound and that after the use of the knife it is away from the wound. Careful dilation of the cervical canal may be performed in cases of suspected carcinoma of the cervix without danger.

PULMONARY ACTINOMYCOSIS

To the Editor:—At present we have in our children's pavilion a 5 year old white boy who has pulmonary actinomycosis, proved by culture of pus obtained by aspiration. Could you give us any information as to the value of sulfanilamide or sulfapyridine or of iodides with or without thymol? What about surgical treatment; e.g., drainage or lobectomy or pneumonectomy? Any information or references would be appreciated.

Samuel A. Jaffe, M. D., New Haven, Conn.

ANSWER.—There is no undisputed evidence to show the specific beneficial effect of any of the drugs mentioned. The use of iodine salts is, of course, traditional. A few patients have been treated with thymol (Myers, H. B.: *THE JOURNAL*, May 29, 1937, p. 1875) and two with sulfanilamide (Miller, E. M., and Fell, E. H., *ibid.*, Feb. 25, 1939, p. 731. Hall, W. E. B., *ibid.*, May 27, p. 2190), all with apparently good results, but conclusions drawn from such limited experiences can be only suggestive. Surgical removal of infected material, when possible, and the curettage and evacuation of dead tissue in the visceral forms have also given good results (Wangenstein, O. H.: *Ann. Surg.* 104:752 [Oct.] 1936). Drainage, lobectomy and pneumonectomy would therefore seem to be worth trying, provided the infection is localized. General symptomatic treatment such as that practiced for the treatment of tuberculosis is of great importance.

CALCANEAL SPURS

To the Editor:—Can you give me any information concerning the injection method with sodium morrhuate for calcaneal spurs? M.D., Arizona.

ANSWER.—Many substances have been used as injection material to give relief from painful heels. Some of these patients have calcaneal spurs, others have not. An important consideration is the relationship of calcaneal bursitis to painful heels. Many of the patients who complain of painful heels have calcaneal bursitis. There is no doubt that the injection has relieved many patients; in some cases it has made them worse. One must realize that any injection in and around the periosteum of a bone is apt to cause considerable pain. Many of the patients who have been relieved by injection therapy have been relieved by the interfiltration of the spur bearing area, in which area there may be a bursa.

Reference:

Levin, Philip: Calcaneal Spurs, *Arch. Surg.* 12:117 (Jan.) 1926.

DANGERS OF MERCURIC OXYCYANIDE

To the Editor:—Is there any danger of absorption of mercuric oxycyanide through the skin? I use it in the strength of 1:1,000 and frequently pick up instruments without having my rubber gloves on. Is there any danger from the vapor that arises from this solution? M.D., Idaho.

ANSWER.—Mercuric oxycyanide is described in New and Nonofficial Remedies as "a basic-mercuric salt of hydrocyanic acid, containing from 51.7 to 56.0 per cent of mercuric cyanide [$\text{Hg}(\text{CN})_2$] and from 44.3 to 48.0 per cent of mercuric oxide (HgO). It is generally used in strengths of from 1:500 to as high as 1:10,000. If taken internally, the product is naturally toxic. The substance has been used as an antiseptic and in the treatment of syphilis more frequently in the past than in the present. Severe acute intoxications have been reported following its use in irrigating sinuses and hollow viscera. In general, it appears that the prospects of cutaneous absorption of mercuric oxycyanide are no greater than for many other mercury compounds widely used for disinfectant purposes. The small quantities of vapors that may arise from a solution of mercuric oxycyanide seem to be without significance.

INTERSTITIAL KERATITIS AND TRAUMA

To the Editor:—A patient had a foreign body embedded in the cornea for three days. The foreign body was removed and a small area of keratitis developed about the site of the foreign body. Within a few days an interstitial keratitis developed and the patient was found to have a 4 plus Wassermann reaction. Is it not probable that the foreign body excited a latent interstitial keratitis? Cannot an irritating substance cause a flare-up of a latent interstitial keratitis in a syphilitic patient? M.D., New York.

ANSWER.—This question raises one of the most interesting and unanswerable medicolegal problems. It is a well known fact that a comparatively minor trauma may be the exciting factor of a typical syphilitic interstitial keratitis and it is equally well known that the majority of cases of interstitial keratitis develop without the history of any preceding trauma. This question is discussed at length, with bibliography and citation of cases, in "Injuries of the Eye" by H. V. Würdemann, second edition, published by C. V. Mosby Company in 1932, page 433. According to various authors, anywhere from 3 to 20 per cent of all cases are precipitated by trauma, which may be of such minor nature as merely the instillation of irritating drops. But since practically all cases of interstitial keratitis are bilateral and the supposedly exciting trauma is usually monocular, the importance of injury as an etiologic factor must be denied. Furthermore, there is no evidence that the disease would not have developed without the trauma.

PRESCRIPTION MIXTURES

To the Editor:—Would there be any objection to the mixture of elixir of sodium thiocyanate with aromatic fluidextract of cascara sagrada and of elixir of sodium thiocyanate with elixir of phenobarbital? Would such a mixture be stable? C. L. Attaway, M.D., Villa Platte, La.

ANSWER.—The elixir of sodium thiocyanate and the aromatic fluidextract of cascara sagrada will form a homogeneous mixture which will not precipitate and which is stable. The same is true of the mixture of the elixir of sodium thiocyanate and the elixir of phenobarbital.

A possible objection to the first mixture would be that there is a combination of a sedative and a laxative in fixed proportions. In cases in which the sodium thiocyanate might presumably be used three times a day, the administration of cascara sagrada might frequently be objectionable. This objection does not apply to the second mixture if small enough amounts of the elixir of phenobarbital are used so that the mixture is not too depressing.

ASTIGMATIC DIAL IN REFRACTIONS

To the Editor:—What is the opinion among ophthalmologists concerning the use and accuracy of the Robinson-Cohen slide in routine refraction, both as a subjective test and under a cycloplegic? M.D., Ohio

ANSWER.—The Robinson-Cohen slide is a refinement of the astigmatic dial that is used by a number of ophthalmologists. It requires the use of the projection type of visual testing apparatus and changing of the slide when it is used. It is one of the most desirable methods of using the astigmatic dial and in the hands of a careful worker, is a useful addition to the refractive equipment. Many refractionists will not take the necessary time to make it useful. It is to be used, of course, in conjunction with other means of testing.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, Nov. 4, page 1757.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science*. Tucson, Dec. 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Medical (Regular)*. Examination. Hartford, Nov. 14-15. *Endorsement*. Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic)*. Derby, Nov. 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: Jacksonville, Nov. 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science*. Des Moines, Jan. 9. *Medical*. Des Moines, Dec. 4-6. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, State Department of Health, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular*. Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*. Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MISSISSIPPI: *Reciprocity*. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

NEBRASKA: Lincoln, Nov. 24-25. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.

NEW YORK: Albany, Buffalo, New York, Syracuse, Jan. 29-Feb. 1. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity and Endorsement*. Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 44 1/2 S. Third St., Grand Forks.

OHIO: Columbus, Dec. 5-7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Science*. Portland, Feb. 24. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozier, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: Austin, Nov. 20-22. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 30 1/2 Franklin Road, Roanoke.

WISCONSIN: *Basic Science*. Milwaukee, Dec. 2. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

St. Louis University School of Medicine.....(1914)	Oklahoma,
(1926) Missouri, (1934) Kansas	
Creighton University School of Medicine.....(1921), (1925),	
(1934), (1935), (1938) Nebraska, (1933) South Dakota	
University of Nebraska College of Medicine.....(1918),	
(1931), (1936), (1937, 2) Nebraska	
University of Cincinnati College of Medicine.....(1935)	Ohio
Jefferson Medical College of .....(1937)	New Jersey
University of Pennsylvania School of Medicine.....(1937)	Minnesota
University of Pittsburgh School of Medicine.....(1937)	Minnesota
Meharry Medical College.....(1937)	Tennessee
University of Tennessee College of Medicine.....(1931)	W. Virginia,
(1935) Tennessee	
Marquette University School of Medicine.....(1923)	Wisconsin
University of Wisconsin Medical School.....(1937)	Wisconsin
University of Manitoba Faculty of Medicine.....(1932)	Minnesota
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....(1934)	New York
Universität Rostock Medizinische Fakultät.....(1934)	Colorado

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....(1937)	N. B. M. Ex.		
Yale University School of Medicine.....(1935)	N. B. M. Ex.		
McGill University Faculty of Medicine.....(1931)	N. B. M. Ex.		

Ohio Reciprocity and Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports forty-six physicians licensed by reciprocity and two physicians licensed by endorsement, July 18, 1939. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine....(1908)			Illinois
Howard University College of Medicine.....(1937)			Tennessee
Emory University School of Medicine.....(1935), (1937)			Georgia
Northwestern University Medical School.....(1936)			Indiana
Rush Medical College.....(1925)			Illinois
The School of Medicine of the Division of Biological Sciences.....(1935)			Michigan
Indiana University School of Medicine.....(1938)			Indiana
State University of Iowa College of Medicine.....(1935)			Iowa
University of Kansas School of Medicine.....(1936)			Kansas
University of Louisville School of Medicine.....(1938, 3)			Kentucky
Johns Hopkins Univ. School of Med. (1919), (1934), (1938)			Maryland
Harvard Medical School.....(1929) W. Virginia, (1934)			N. Carolina
University of Michigan Med. School.....(1921), (1929), (1933), (1934), (1935)			Michigan
Wayne University College of Medicine.....(1939)			Michigan
St. Louis Univ. School of Medicine (1932), (1936), (1937)			Missouri
University of Nebraska College of Medicine.....(1932), (1938, 2)			Nebraska
University of Buffalo School of Medicine.....(1934)			New York
University of Rochester School of Medicine.....(1938)			New York
Eclectic Medical College, Cincinnati.....(1918)			Kentucky
Hahnemann Med. College and Hospital of Philadelphia (1938)			Kentucky
University of Pennsylvania School of Medicine.....(1937)			New York
Tennessee Medical College.....(1900)			Kentucky
University of Tennessee College of Medicine.....(1925)			Tennessee
Vanderbilt Univ. School of Med. (1935) Connecticut (1938)			Tennessee
Marquette University School of Medicine.....(1938)			Wisconsin
Karl-Franzens-Universität Medizinische Fakultät, Graz (1932)			New York
Medizinische Fakultät der Universität Wien.....(1926)			Louisiana
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main.....(1923)			Maryland
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....(1916)			New York
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....(1935)			Maryland, New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College.....(1926)	N. B. M. Ex.		
University of Edinburgh Faculty of Medicine.....(1937)	N. B. M. Ex.		

Michigan Indorsement Report

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports sixty-nine physicians licensed by indorsement from January 3 through July 28, 1939. The following schools were represented:

School	LICENSED BY INDOORSEMENT	Year Indorsement Grad.	Indorsement of
University of Arkansas School of Medicine.....(1938, 2)			Arkansas
College of Medical Evangelists.....(1934), (1936)			California,
(1934) Colorado			
University of Colorado School of Medicine.....(1938, 2)			Colorado
Howard University College of Medicine.....(1936)			Tennessee
Bennett College of Eclectic Medicine and Surgery.....(1911)			Illinois
.....of Medicine (1919), (1926), (1933)			Illinois
.....'31) Ohio			
.....Medical School.....(1935)			Kansas,
.....'38) Illinois			
Rush Medical College.....(1933), (1935, 2)			Illinois
The School of Medicine of the Division of Biological Sciences.....(1936)			Illinois
University of Illinois College of .....(1936)			Illinois
Indiana University School of .....(1936)			Indiana
State Univ. of Iowa College of .....(1936)			Iowa
University of Kansas School of Medicine.....(1933)			Kansas
University of Louisville School of Medicine (1934), (1938, 2)			Kentucky
Tulane University School of Medicine.....(1938)			Louisiana
Johns Hopkins University School of Medicine.....(1936)			Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1935)			Maryland

Iowa Reciprocity and Endorsement Report

Mr. H. W. Grefe, director, Division of Licensure and Registration, reports forty-six physicians licensed by reciprocity and three physicians licensed by endorsement from January 20 through September 21. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.....(1930)			California
Loyola University School of Medicine.....(1930)			Illinois
Northwestern University Medical School.....(1938)			Wisconsin,
(1939) Illinois			
Rush Medical College.....(1937)			Illinois
Minnesota			
University of Illinois College of Medicine.....(1932)			Missouri
Indiana University School of Medicine.....(1930)			Indiana
University of Kansas School of Medicine.....(1930), (1935, 2)			Kansas
University of Louisville School of Medicine.....(1935), (1936)			Kentucky,
(1936) Nebraska			
University of Michigan Medical School.....(1930)			Michigan
University of Minnesota Medical School.....(1933), (1937), (1938)			Minnesota,
Washington University School of Medicine.....(1935)			Missouri

BOOK NOTICES

Jour. A. M.
Nov. 11, 1938

Altogether this work is to be recommended as an exhaustive, painstaking and thoughtful review of a subject of tremendous importance. It should serve to correct a considerable number of misconceptions regarding the statistical facts respecting results in the surgical treatment of gastric cancer.

Studies on the Changing Incidence of Peptic Ulcer of the Stomach and Duodenum. By Gunnar Alsted, M.D., Privat-docent at the University of Copenhagen, Copenhagen. With a preface by Professor E. Meulengracht. Cloth. Price, 10s. Pp. 148, with 12 illustrations. Copenhagen: Einar Munksgaard; London: Oxford University Press, 1939.

Penna.
Maine
Missouri
Nebraska
Ohio
Oklahoma
Penna.,
N. Jersey
Penna.
Ohio
Tennessee,
Tennessee
Texas
Virginia
Wisconsin
Wisconsin

Harvard Medical School..... (1937)
Tufts College Medical School..... (1931)
Washington University School of Medicine..... (1934)
University of Nebraska School of Medicine..... (1934)
Ohio State University College of Medicine..... (1931), (1937)
Western Reserve University School of Medicine..... (1938, 2)
University of Oklahoma School of Medicine..... (1937)
Jefferson Med. College of Philadelphia (1931), (1934), (1936)
Temple University School of Medicine..... (1933)
University of Pennsylvania School of Medicine..... (1936)
Woman's Medical College of Pennsylvania..... (1938)
Melharry Medical College..... (1924), (1934), (1936)
University of Illinois..... (1937)
University of Tennessee College of Medicine (1936), (1937, 2)
Baylor University College of Medicine..... (1937)
University of Texas School of Medicine..... (1935), (1938)
Univ. of Virginia Department of Medicine (1932), (1938)
Marquette University School of Medicine..... (1921)
University of Wisconsin Medical School..... (1934)

Book Notices

End-Results in the Treatment of Gastric Cancer: An Analytical Study and Statistical Survey of Sixty Years of Surgical Treatment. By Edward M. Livingston, B.Sc., M.D., Associate Visiting Surgeon, Bellevue Hospital, New York, and George T. Pack, B.Sc., M.D., F.A.C.S., Attending Surgeon, Memorial Hospital, New York City. With a foreword by Bowman C. Crowell, M.D., Associate Director, American College of Surgeons. Cloth. Price, \$3. Pp. 179, with 7 illustrations. New York & London: Paul B. Hoeber, Inc., 1939.

This book is a statistical survey and analytic study of the surgical treatment of cancer of the stomach. The history of the surgical attack on this dread condition, as it has been revealed in medical literature, is traced in detail from the first successful gastrectomy by Billroth in 1881. The previous history is briefly reviewed and the authors come quickly to a minute consideration of the Therapeutic Era, which began over a half century ago. The first "classic study of Welch" (1885) is reviewed, which contained the pessimistic summary that "no patients subjected to resection survived longer than a year and a half." Some of the later reports are then surveyed and, comparing reports, Livingston and Pack pose the arresting question: "How could there be but three five year survivals in the quarter century in so prominent an institution as the Johns Hopkins Hospital up to 1915, then a report from another clinic but a relatively few years thereafter, of 127 ten year survivals?"

This question they themselves then undertake to answer in an analysis of the various factors, frequently overlooked, that make the reports of a number of "cures" apparently so contradictory. Thus it is pointed out that the number of "cures" that can be reported depends on the number of total patients seen, on the number considered operable, on the number considered resectable, on the period elapsed since operation, on the completeness of follow-up and on the mortality rates from other causes than cancer as well as on the survival from gastric cancer itself. Since one or more of these factors may be vastly different in different experiences, the number of reported cures also will differ. These points are elaborated and illustrated statistically by Livingston and Pack in considerable detail and with great acumen, and they categorize what are the primary requisites for cancer survival statistics if they are to be meaningful. When various reports from different sources are tabulated in a consistent way, it is found that there is actually a close agreement between the results of various authors and that the outlook for patients who have a partial resection for gastric carcinoma, while surely not rosy, is vastly better than that exemplified in the first classic report of Welch and considerably better than is commonly assumed. More than 14,000 partial gastrectomies for gastric carcinoma reported in the literature are included in the review. A striking feature of the work is contained in a supplement of eighty-nine pages of charts, giving the statistical facts adduced in graphic form. These are admirably conceived and executed and should be useful for general lectures and public education. A second supplement of twelve pages gives in tabular form a review of the series studied and the main summary statistical facts of each. A third supplement lists a bibliography of 358 items. Curiously this does not list the last report of the experience of the Mayo Clinic by Balfour, (*Ann. Surg.* 105:733 [May] 1937) although certain statistics in the text and charts appear to have been obtained from this article. Apparently this is due to a clerical error.

Man Against Himself. By Karl A. Menninger. Cloth. Price, \$3.50. Pp. 485. New York: Harcourt, Brace & Company, 1938.

This is an interesting presentation which proposes to group all impulses toward self destruction and to endeavor to explain them by a single theory. The author makes no claim that the theory is proved; he brings forward a great many interesting and for the most part convincing examples in support of it. Briefly stated the theory is that, from the uterus to the grave life is a struggle between the will to live and the wish to die and that various manifestations of human conduct represent different types and degrees of compromise between these conflicting drives or compulsions. The self destructive instinct is resolved by the author into three components, the aggressive (wish to kill), the punitive (conscience) and the submissive (wish to be killed). He takes up first suicide in the ordinary sense, that is, destruction of his life by the individual himself through swift, dramatic and often apparently sudden and impulsive acts. That these are never sudden or impulsive but the logical solution of deep-seated personality problems is part of the thesis of the book. From suicide he proceeds to a consideration of "chronic suicide," under which he deals with asceticism, martyrdom, re-

rotic invalidism, alcohol addiction, antisocial behavior and psychoses. He regards these as somewhat more successful though highly unsatisfactory solutions of personality conflicts. Next he considers focal suicide, under which he classifies self mutilations, malingering, addiction to surgery, purposive accidents, impotence and frigidity. Proceeding farther along the same line he analyzes organic suicide, in which he presents evidence, admittedly incomplete and fragmentary, in support of his conception that the psychologic factor in organic disease is far greater than is commonly recognized. In this connection the author presents a discussion of the totality concept in medicine and a brief consideration of the lesser evil as a more or less unsatisfactory compromise between the will to live and the wish to die. In diagrammatic form this is represented as the span from the uterus to the grave blocked by a black obstruction marked "external reality." In health this obstruction is completely avoided by a long elliptic detour labeled "normal excursion of life," composed largely of self-preservative impulses with a small component of self-destructive impulses. A shorter course skirting closer to the barrier but still avoiding it is labeled "neuroses" and is more heavily tintured with self-destructive impulses. A still shorter curve colliding directly with "external reality" is labeled "psychoses" and has a heavy preponderance of self-destructive impulses. The shortest course of all, composed entirely of self-destructive impulses, is labeled "suicide" and represents almost a direct line from the uterus to the grave. An exactly similar diagram is presented in which the life curves are labeled respectively "health," "hysterical lesions," "structural lesions" and "fatal processes." The first diagram is representative of psychiatric categories, the second of medical categories.

The book is an intensely interesting and logical exposition of a theory. The theory is, of course, predicated on the acceptance of psychoanalysis, to which the author is so completely committed that he regards its rejection as an example of stupidity, stubbornness or neuroticism. The book is one that no doctor, in view of the increasing interest in psychosomatic medicine, can afford to ignore. It appears to be published for lay readers, but despite its interesting style and its wealth of illustrative cases from medical literature, newspapers and news magazines it will make difficult reading for one who has not previously gained a conception of the workings of the human mind and a reasonable familiarity with the theory of psychosis.

Sulphonamide Treatment of Experimental Tuberculosis in Guinea Pigs. By Konrad Birkhaug, M.Sc., M.D. A Lecture Delivered at the Chr. Michelsen Institute's Annual Meeting, March 14, 1939. Paper. Pp. 59, with 7 illustrations. Bergen: A. S. John Griegs Boktrykkeri, 1939.

No medical institute worthy of the name exists which has not been intrigued by the possibilities of research with the drug sulfanilamide or its derivatives. In fact, not since the epoch-making discovery of Ehrlich has a new chemotherapeutic agent received such universal scientific recognition as sulfanilamide. Dr. Konrad Birkhaug in his lecture delivered at the annual meeting of the Christian Michelsen Institute, Bergen (March 14, 1939), reviews much of the work which has already been covered in the enormous medical archives of the past three years. In his lecture he reviews the chemistry of the various compounds. He states: "Happily, this cumbersome chemical name has been abbreviated by the Council on Pharmacy and Chemistry of the American Medical Association to sulfanilamide." In his lecture he pays particular attention to the work on sulfanilamide as outlined by Marshall, Emerson and Cutting and discusses thoroughly the dosage and chemotherapeutic range of the product. He also reviews rather extensively the treatment of experimental tuberculosis with sulfanilamide and concludes that prolonged sulfanilamide treatment in vivo failed to exert any attenuating action on the virulence, tuberculinogenesis, growth, cultural or tinctorial characteristics of the tubercle bacillus. He also reports that in the case of prontosil soluble there was some inhibitory action probably due to bacteriostatic effect which renders the virulent tubercle bacillus temporarily impotent but that the huge dose of prontosil soluble required to bring about this indirect effect makes it obvious that this form of sulfanilamide therapy falls short of representing the ultimate goal in the chemotherapy of clinical tuberculosis.

Relation of Trauma to New Growths: Medico-Legal Aspects. By R. J. Behan, M.D., Dr. Med., F.A.C.S., Surgeon, St. Joseph's Hospital and Dispensary, Pittsburgh. Cloth. Price, \$5. Pp. 425. Baltimore: Williams & Wilkins Company, 1939.

The author has accomplished a comprehensive review of a subject which is greatly in need of clarification. His approach to the problem is orderly. Following introductory references to historical aspects of the relation of trauma to cancer, the first chapters cover general phases of the subject, notable among which are those in reference to a classification of trauma and to the single trauma and aggravation controversies. This division of the book is concluded by an excellent presentation of the postulates which must be given consideration in determining the causative relationships between a malignant growth and previous injury. The remainder of the volume represents individual reviews of cancer in relation to occupation, medicolegal proof that trauma is the etiologic factor in a particular instance, and malignant disease following trauma involving various anatomic structures and systems, all of which are well developed. The work as a whole constitutes an excellent source of reference for the expert medical witness. Because of the extension of interest in the field of industrial disease and the relation of trauma to various pathologic states, this book should prove timely.

Handbuch der Viruskrankheiten mit besonderer Berücksichtigung ihrer experimentellen Erforschung. Unter Mitarbeit von K. Beller et al. Herausgegeben von Prof. Dr. E. Gildemeister, Vizepräsident des Instituts Robert Koch, Berlin, Prof. Dr. E. Haagen, Abteilungsleiter am Institut Robert Koch, und Prof. Dr. O. Waldmann, Direktor der Staatl. Forschungsanstalten, Insel Riems bei Greifswald. In zwei Bänden. Band II. Paper. Price, 44 marks. Pp. 768, with 105 illustrations. Jena: Gustav Fischer, 1939.

This book was written by the authors with the collaboration of thirty other investigators. The chapters are divided under seven headings: virus diseases with specific localization, virus diseases of cold blooded animals, virus diseases of insects, virus diseases of plants, viruses and tumors, diseases with virus-like agents and diseases of questionable virus etiology. Many chapters are concerned with animal diseases caused by viruses. The virus diseases with specific localizations are subdivided into three groups: (a) diseases of the respiratory tract, comprising nine chapters, one devoted to psittacosis, one to influenza, one to the common cold and the others to animal diseases, (b) diseases of the nervous system, comprising thirteen chapters treating such diseases as poliomyelitis, encephalitis and rabies, (c) diseases of other organs, treated in six chapters and including such diseases as venereal lymphogranuloma, molluscum contagiosum, and epidemic parotitis. Under the heading of diseases with virus-like agents are eight chapters in which such diseases as typhus fever and trachoma are discussed. A chapter on bacteriophage is also included under this heading. The second volume, like the first, is beautifully illustrated and the chapters are each followed by excellent bibliographies. This volume can be heartily recommended to research workers interested in virus diseases and also as a reference work to the physician interested in these diseases.

The Complete Guide to Bust Culture. By A. F. Nlemoeller, A.B., M.A., B.S. With a foreword by Edward Podolsky, M.D. Cloth. Price, \$3.50. Pp. 160, with illustrations. New York: Harvest House, 1939.

The reader who chooses this book because of its title is likely to be disappointed. Starting with the first chapter, which serves as the introduction to the subject, and continuing for 160 pages to the twenty-fourth chapter, which discusses diseases of the breast, one hopes in vain for some effective method that will develop the bust and will not be just a makeshift or an appliance that gives the illusion of a well developed bust. The chapters on physiology and anatomy are well written in simple language and give excellent information to the reader. In the chapters on exercise the author warns the reader at the beginning not to expect exercises to "do the impossible." He states that exercise will "do what it can as surely and dependably as any method in existence." The exercises he advocates are simple exercises that aim to bring about a better posture and are well known to most persons. The influence that diet has on the bust is told in the first paragraph of the chapter and the patient is warned that the breasts react the same as does any other part of the body in that it is not possible to feed a particular portion and ignore the rest. He warns against freak diets, sudden loss of weight in the obese and the too rapid gain of weight for the

very thin woman. The author neatly sums up the effects of creams and lotions on the bust by saying that the claim that such products can either "enlarge or reduce the breasts is utterly ridiculous." Of most value to the reader will be the chapters on brassières. The author discusses adequately the function of a brassière and describes the type that can be employed for the various types of busts. The final two chapters should have been omitted, as advice about actual treatment for various disease conditions of the breast is outlined. The warning that the physician needs to be consulted occurs only when potent drugs may be found to be necessary. Such advice as "liquids are restricted" and "cathartics administered," as well as "cautious massage" and "the breast pump should be employed," should not be left to the discretion of the patient. The discriminating reader will find some good information in this volume but must discount some parts as not being useful information for her.

Health and Unemployment: Some Studies of Their Relationships. By Leonard C. Marsh, Director of Social Research, McGill University, Montreal. In collaboration with A. Grant Fleming, Professor of Public Health and Preventive Medicine, McGill University, Montreal, and C. F. Blackler. Published for McGill University. Cloth. Price, \$3. Pp. 243, with 36 illustrations. New York: Oxford University Press, 1938.

The relationship of health to unemployment has been developed in the United States to a political issue. The authors realize, as they point out in their preface, that one question which must be considered side by side with the provision of medical care is that of nutrition. They say that, even if the network of medical nursing and hospital services is radically widened from its present coverage through health insurance, the doctor is still limited in his work by the physique and environment of his patients. The authors are convinced apparently that a national system of health insurance is fundamental to every other type of medical problem, and they have apparently accepted the statements by Falk as the basis for their conclusions.

Man Against Microbe. By Joseph W. Bigger, Sc.D., M.D., F.R.C.P.I., Professor of Bacteriology and Preventive Medicine, Trinity College, University of Dublin. Cloth. Price, \$2.50. Pp. 304, with 17 illustrations. New York: Macmillan Company, 1939.

There are good microbes and bad ones. The bad ones are those which bring about disease in human beings and animals. The good ones are those which participate in agriculture and industry. In this simple and well written book the author first discusses the nature of bacteria, next bacteria as a cause of disease, and finally control of food supplies, clean air and other sanitary problems. His book includes also brief sketches of the great contributors to bacteriologic science. It is a useful book, particularly for boys and girls of college age who have a special interest in this subject.

Health Officers' Manual: General Information Regarding the Administrative and Technical Problems of the Health Officer. By J. C. Geiger, M.D., Dr. P.H., Sc.D., Director, Department of Public Health, City and County of San Francisco, California. Cloth. Price, \$1.50. Pp. 148, with 12 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

From his wide experience in public health, Dr. Geiger has prepared the manual dealing briefly with general principles of public health and organization. All details of controversial subjects are omitted. Dr. Geiger's knowledge and organizing ability show clearly in the type of book which he has prepared.

The introductory material concerning organization should be a helpful guide to the health officer in the establishment of basic services. Under records and statistics are included birth and death registration, collection of material for statistical study, graphic presentation and the explanation of procedures generally used in morbidity and mortality records. Under medical services are included programs on child hygiene, public health nursing, dental hygiene, mental hygiene and nutrition. The communicable diseases are classified according to control measures applied. It is advocated that medical services rendered by the health department include an emergency service, hospitalization facilities and homes for children, the aged and incapacitated persons. The inspection and control services consider procedures in food inspection and control, housing inspection, industrial hygiene, camp sites and laboratories. The manual is well written, is easily read and should serve as a useful guide to health officers in the administration of a balanced public health program. While

primarily intended for those actively engaged in public health activities, this manual could be read with interest by the average lay person and would give him, in not too complicated form, a sufficiently comprehensive idea of modern trends in public health.

The Physiology of Exercise: A Textbook for Students of Physical Education. By James Huff McCurdy, A.M., M.D., M.P.E., Research Worker (Herbert L. Pratt Research Fellowship), 1935—, and Leonard A. Larson, B.A., B.P.E., M.Ed., Professor of Health and Physical Education in Springfield College (Corporate Title, International Young Men's Christian Association College), Springfield, Massachusetts, 1933—. Third edition. Cloth. Price, \$3.75. Pp. 349, with 3 illustrations. Philadelphia: Lea & Febiger, 1939.

The first edition of this book was published some years ago. The authors have made considerable revision and added a section on exercise for people over 40 and another on exercise for women. They have availed themselves of a large amount of research recently published and also of the personal advice of many of the leaders in the field of physiology of exercise. Each of the chapters is supplied with an adequate bibliography. The book is of the utmost importance as a guide to all of those who work in association with modern athletics.

Discovery of the Elements. By Mary Elvira Weeks, Associate Professor of Chemistry at the University of Kansas, Lawrence, Kansas. Fourth edition. Cloth. Price, \$3.50. Pp. 470, with illustrations collected by F. B. Dains, Professor of Chemistry at the University of Kansas, Easton, Pa.: Journal of Chemical Education, 1939.

The history of chemistry has been told in many ways. Here in brief form is the history of the discovery of each of the elementary substances with profuse illustrations and with brief biographical sketches of many of the noted chemists who contributed to the advancement of chemical science. The book is completed with a chronologic table and contains also a good index.

Nursing Through the Years. By Corinne Johnson Kern. Cloth. Price, \$2.50. Pp. 340. New York: E. P. Dutton & Co., Inc., 1939.

The author of this book has written two previous volumes, entitled "I Go Nursing" and "I Was a Probationer." She is apparently much impressed with her life as a nurse, and she fills her book of reminiscences with innumerable anecdotes from the time she began nursing in 1900 to the present period, when she lives in the mountains and even here finds opportunity for her skill and her work. She writes with some facility; her book should be interesting to the great public, which is just beginning to find out the trials and tribulations of all those who work in the medical field.

Nobel Prize Winners. Charts, Indexes, Sketches. Compiled by Flora Kaplan. Boards. Price, \$1.53. Pp. 60, with 2 illustrations. Chicago, Illinois: The Author, 1939.

In 1938 there was printed in Sweden a book on "The Nobel Prizes and Their Founder Alfred Nobel," by Fritz Henriksen (THE JOURNAL, Aug. 19, 1939, p. 711). Now there becomes available a pamphlet entitled "Nobel Prize Winners," compiled by Flora Kaplan and dedicated to Jane Addams. This includes also a brief sketch of Alfred Nobel, a copy of his will, a complete table of Nobel prize winners from 1901 to 1938 with reclassification by nationality and with brief biographic sketches of Nobel prize winners in each of the various categories. There are also special analyses of Nobel prize winners by nationality, sex, race and religion. Both these pamphlets are exceedingly useful sources of reference on this most interesting topic.

Treatment in General Practice: The Management of Some Major Medical Disorders. Volumes I and II. First American edition. Cloth. Price, \$7.50 per set. Pp. 259, with 6 illustrations; 436, with 8 illustrations. Boston: Little, Brown & Company, 1939.

The articles contained in these books were written as a series published by the *British Medical Journal* with a view to bringing general practitioners up to date on medical treatment. The books were published in Great Britain during 1936 and republished in 1938. They are introduced to the American medical profession by Dr. Reginald Fitz. The articles are succinct and practical but, obviously, not wholly up to date, as indicated by the fact that sulfapyridine is not even mentioned in the discussion of the treatment of pneumonia. There are

also references to medicinal products which are chiefly British and which are hardly known by their British names in this country. For instance, in one place readers are told to purchase their rubber mattresses from the Dunlop Rubber Company in England and other material useful in allergy from another British company. Throughout, indeed, all of the references are to British agencies. Thus the book is not nearly as useful as it would have been if it had been revised for American readers with new American work in mind. Nevertheless any general practitioner will find here innumerable practical hints of value in the daily practice of medicine.

Benjamin Franklin Calls on the President. By John de Meyer. Cloth. Price, \$1.25. Pp. 90. New York: Ives Washburn, Inc., 1939.

In this little satire the author has conceived that Benjamin Franklin rose from his grave on the 149th anniversary of his death and went to visit the President. It is the kind of humor that appeared in the book called "A Connecticut Yankee in King Arthur's Court." Benjamin Franklin comes in contact with the modern motor car, the shower bath, modern credit and debt, and the New Deal. It is interesting to find what the author thinks Benjamin Franklin would have said about spending oneself back into prosperity.

Hospital Dietetics as a Career. The Institute for Research, Research No. 41. Paper. Price, \$1. No pagination, with 3 illustrations. Chicago, Illinois: Institute for Research, 1939.

This twenty-four page illustrated booklet is designed to present adequately the calling of hospital dietetics as a career. It is readable and complete. It should be helpful to every person interested in becoming a dietitian.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Revocation of License for Allegedly Prescribing Narcotics to Satisfy Addiction.—The Colorado state board of medical examiners revoked the appellant's license to practice medicine on the basis of a charge that he was guilty of grossly negligent or ignorant malpractice and of immoral, unprofessional or dishonorable conduct. The district court of the city and county of Denver affirmed the revocation order and the physician prosecuted a writ of error in the Supreme Court of Colorado.

In brief, the physician was charged with writing various prescriptions of morphine for several named persons purportedly for the treatment of specified diseases when in fact the morphine was prescribed to satisfy narcotic addiction. The evidence showed that the morphine was prescribed in the quantities and to the persons named in the charge but, said the Supreme Court, there was no evidence in the record that the persons named were not suffering from the particular diseases specified on the prescriptions. The medical practice act authorizes the board to revoke a license to practice medicine if the physician has been convicted of a felony or of a crime involving moral turpitude or is "guilty of grossly negligent or ignorant malpractice" or of "immoral, unprofessional or dishonorable conduct." A conviction in a United States court on a charge of selling morphine to a habitual user thereof for other than medicinal purposes, the court said, is a conviction of a crime involving moral turpitude and warrants revocation of the physician's license. *White v. Board of Medical Examiners*, 70 Colo. 50, 197 P. 564. The physician in the present case, however, had not been so convicted. The board apparently proceeded on the assumption that it was sufficient if it found from evidence before it that there was a violation of the federal narcotic laws by the physician and reasoned that if a conviction of such violation in a court of competent jurisdiction carries with it the inference of moral turpitude as a matter of law, a finding by the board of such a violation has a similar effect. Such an assumption, the court said, was erroneous. The

board in a proceeding of this kind, until a conviction is shown, has no concern with the provisions of the Harrison Narcotic Act nor with the regulations promulgated thereunder. The board is not vested with jurisdiction to try alleged offenders for a violation of the act and may not make its own finding of such violation and predicate thereon either malpractice or immoral, unprofessional or dishonorable conduct. Acts that are inhibited by the Harrison Narcotic Act may be considered by the board where there has been no conviction, but such acts must be proved by competent evidence to constitute malpractice or immoral, unprofessional or dishonorable conduct, without regard to the violation of any law that inhibits them.

Treatment that is proper by correct medical standards does not constitute malpractice even though some law is violated. Malpractice consists of a failure to exercise that degree of care and skill in diagnosis or treatment which may reasonably be expected from one licensed and holding himself out as a physician, under the circumstances of the particular case. In the present case there was no expert testimony tending to prove a failure properly to diagnose or to treat the disease of the various persons with respect to whom malpractice was charged. It was not enough that the board may be composed of experts who applied their knowledge of diagnosis and treatment to the case. The medical practice act provides for a review by the district court in revocation proceedings and on such review the court may determine whether the board regularly pursued its authority or abused its discretion. Such determination can be made only on the evidence appearing in the record. Obviously the reviewing court cannot be left to speculate on what was in the minds of the individual board members.

Neither the regulations promulgated by the Commissioner of Narcotics, the Colorado narcotic act nor the Harrison Narcotic Act purport to limit the purpose for which or quantity of any drug that may be prescribed in good faith by a physician in treating a patient in the practice of his profession, and there was no evidence that the morphine prescribed by the physician in this case was not prescribed in good faith. The amounts prescribed and the frequency of prescriptions might be such that in and of itself it would indicate to one skilled in their proper use that a physician could not possess ordinary skill and in good faith so frequently prescribe such quantities. Such matters, however, being only within the knowledge of experts, must be shown by the testimony of experts appearing in the record. There was no such testimony in the present case.

It was charged that several of the prescriptions issued by the physician were not given in good faith but for the satisfaction of the patient's addiction, contrary to the federal narcotic laws. If that is true, the court said, there is a forum in which the guilt or innocence of the offender may be determined. If convicted in such forum, the physician's license may be revoked. But, until such conviction, the propriety of prescribing for such a purpose is to be determined not by the board asking and answering the question as to whether some statute or regulation issued pursuant thereto has been violated but by asking and answering the question as to whether, aside from any law or regulation, the diagnosis and treatment was such as a physician possessed of ordinary skill in the exercise of ordinary care in applying his skill with the object of promoting the patient's physical well being might make and prescribe.

The finding of the board was further to the effect that all the acts charged against the physician constituted not only malpractice but also immoral, unprofessional and dishonorable conduct. It appeared, the court observed, that the physician kept full records and had never failed or refused to make them available to officers entrusted with enforcing the narcotic laws. No member of the medical profession testified that the acts were outside the limits within which skilled and honorable men exercising ordinary care might operate in the practice of their profession. No recognized canons of ethics were shown by the evidence to have been violated, even if that were a matter for the board's consideration. In *Sapero v. State Board*, 90 Colo. 568, 11 P. (2d) 555, it was held that a mere violation of canons of ethics not amounting to a breach

of legal duty does not constitute a sufficient ground for the revocation of a license. Since in the present case all the acts relied on as constituting immoral, unprofessional or dishonorable conduct related to patients of the physician and to his manner of treatment, in the absence of evidence showing what a physician of reasonable and ordinary skill, applying it with ordinary care in the diagnosis and treatment of the patient involved, would have done, or should have done, the record furnished no factual standard for the board's conclusion and no standard for the court to determine whether the acts charged amounted to a breach of the legal duty which the physician owed to his patient and to society in the practice of his profession.

The judgment upholding the revocation order was therefore reversed and the trial court was directed to refer the matter back to the board of medical examiners for such further proceedings, if any, as it might deem advisable.—*McKay v. State Board of Medical Examiners (Colo.)*, 86 P. (2d) 232.

Accident Insurance: Death Due to Hypersusceptibility to Novocaine Not Death by "Accidental Means."—Preparatory to the performance of a tonsillectomy on the insured, novocaine (procaine hydrochloride) was administered hypodermically, infiltrating the tissue about her tonsils. Before "the usual amount" had been injected, her pulse weakened, she became pale, her body began to show a bluish cast, her breath became irregular and she died within a few minutes. Death was attributed to the patient's "hypersusceptibility" or "hypersensitivity" to novocaine. The plaintiff, as the beneficiary under insurance policies on the life of the deceased, sued two insurance companies on the policies. Those policies provided certain benefits in case of death due to bodily injuries caused solely by external, violent and accidental means. From a judgment in favor of the plaintiff, the insurance companies appealed to the Supreme Court of Appeals of West Virginia.

The principal question involved was whether or not death resulted from "accidental means." The plaintiff contended that if the use of novocaine resulted in something unforeseen and unexpected, the death resulted through accidental means even though the novocaine was injected intentionally and with the consent of the insured. The court admitted that the means employed by the physician produced unusual and unexpected results but refused to hold that the means by which they were produced were accidental. The physician did exactly what he intended to do and the patient invited it and therefore consented. The court thought that it could not be said that under such circumstances the means employed were accidental, even though the result was not one which was contemplated or expected and was due to an unknown and rare hypersusceptibility. The "means" employed were intentional, not accidental. In the opinion of the court the death did not come within the provisions of the policies sued on.

The judgments in favor of the plaintiff were reversed and new trials ordered.—*Oley v. John Hancock Mut. Life Ins. Co.; Same v. Educators Beneficial Ass'n (W. Va.)*, 199 S. E. 596.

Cosmetology: Services as "Professional Services"—Negligence as "Malpractice."—The defendant insurance company agreed to indemnify Herzberg's, Inc., a department store, against claims arising out of accidental bodily injuries occurring within the store. The policy, however, contained an endorsement which excepted the insurer from liability for—

bodily injuries, illness, or death resulting therefrom, suffered . . . in consequence of an error or alleged error or mistake in administering, applying or dispensing drugs, chemicals, mixtures or the like; or in the making or compounding of prescriptions; or in consequence of professional services or treatments or the omission thereof, or malpractice on the part of any physician, surgeon, nurse, druggist, assistant, attendant or any person connected with the Assured in the operation of the business covered by this policy.

A customer underwent a procedure in one of the departments of the store designed to remove superfluous hair, which procedure was administered by a so-called cosmetician, using an electrical apparatus called a "Tricho" machine. The customer was injured and subsequently sued the store, recovering judgment. The insurer refused apparently to pay either the judgment or the cost of defending the suit, and the store sued it

on the policy, recovering judgment in the district court of the United States for the district of Nebraska. The insurance company then appealed to the circuit court of appeals, eighth circuit.

The trial court, said the circuit court of appeals, apparently considered that the endorsement excepting the insurer from liability was confined to instances in which injury was "suffered in consequence of professional treatments administered by any physician, surgeon, nurse, druggist, or by any assistant, attendant or helper to any such physician, surgeon, nurse or druggist." Such a construction of the endorsement is too narrow. The endorsement provided, among other things, that the insurance company should not be liable for bodily injuries suffered by any person in consequence of professional services or treatments or malpractice, on the part of any attendant, person or persons connected with the assured in the operation of the business covered by the policy. The treatment of the customer's face for the removal of superfluous hair was a professional treatment administered in a department of the store by persons connected with the assured in the operation of its business. The department was held out to the public as qualified to administer treatments of the nature employed in beauty shops generally. The operator of the shop and her assistant were educated in schools devoted to instruction in the "art" of cosmetology.

It is significant in this connection that Nebraska has undertaken to regulate the practice of cosmetology by enacting a statute requiring certain educational and moral qualifications of persons licensed to practice cosmetology and authorizing the revocation of such licenses for the commission of malpractice and unprofessional conduct. The term "profession" in the past has been so generally associated with theology, medicine and law that the construction adopted by the trial court may be readily understood, but the term has long ceased to be restricted exclusively to those so-called learned professions. The term is defined in the New Century Dictionary, 1927, as follows:

Formerly theology, law and medicine were specially known as the professions; but as the application of science and learning are extended to other departments of affairs, other vocations also receive the name.

In the Oxford English Dictionary, 1926-1932, a "profession" is defined as

. . . the occupation which one professes to be skilled in and to follow [which involves a] vocation in which a professed knowledge of some department of learning or science is used in his application to the affairs of others, or in the practice of an art founded upon it.

The fact, continued the court, that physicians, surgeons, nurses and druggists are specifically mentioned in the endorsement does not limit its application to such professions and vocations. The obvious error involved in the professional application of the Tricho apparatus, whether due to negligence or ignorance, amounted to malpractice under the terms of this endorsement. Consequently, the insurance company is not liable under the policy.

The judgment below in favor of the department store was reversed.—*Ocean Accident & Guarantee Corporation, Inc., v. Herzberg's, Inc.*, 100 F. (2d) 171.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Allen Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 69-104 (Sept.) 1939

Reducing Pneumonia Death Rate. G. S. Bryan, Amory, Miss.—p. 69.
*New Technic for Blood Sedimentation Test. C. Brooks, New Orleans.—p. 72.

Sulfapyridine: Its Use in Pneumococcal Infections. H. Kennedy and J. S. Smith, Birmingham.—p. 73.

Acute Purulent Pericarditis: Report of Case. J. O. Finney and J. O. Morgan, Gadsden.—p. 81.

New Technic for Blood Sedimentation Test.—Brooks outlines a blood sedimentation test which he believes is not difficult or complex in its performance and therefore its use should not be restricted. The method consists of filling a pipet with blood directly from the vein and setting the tube immediately in the vertical position in a holder. The graduated limb of the pipet is filled with anticoagulant, all of which is blown out except the thin film adherent to the inside of the tube. The graduated limb is then filled by inserting the needle into a vein and permitting the blood to flow into the tube by its own pressure. As soon as the tube is filled just beyond the 100 mm. mark, the cock is closed, cutting off the lumen exactly at the 100 mm. mark; the column of blood held in the tube is thus exactly 100 mm. long. The needle is quickly removed and the tube is immediately put in the vertical position in a holder. The sedimentation is observed for an hour or longer and the results are recorded on a chart. The method is simple, automatic, direct and precise. Its employment should encourage a wider use of the blood sedimentation test.

American Journal of Public Health, New York

29: 983-1082 (Sept.) 1939

Developments in the New York State Tuberculosis Program. R. E. Plunkett, Albany, N. Y.—p. 983.

Occurrence, Pathologic Aspects and Treatment of Fluoride Waters. M. S. Nichols, Madison, Wis.—p. 991.

*Morbidity and Mortality from Scarlet Fever in the Negro. P. B. Cornely, Washington.—p. 999.

Control of Syphilis in a Southern Rural Area: Preliminary Report. L. E. Burney, Brunswick, Ga.—p. 1006.

Public Health Nursing Program of the Future. G. C. Ruhland, Washington, D. C.—p. 1015.

Morbidity and Mortality Statistics as Health Information. H. Williams, Baltimore.—p. 1019.

The School Nurse as a Health Educator. Gertrude E. Cromwell, Des Moines, Iowa.—p. 1022.

Industry's Challenge to the Nurse. LaVona Babb, St. Joseph, Mo.—p. 1025.

Newer Concepts and Procedures of Maternal Care. Maude M. Gerdes, Washington, D. C.—p. 1029.

Epidemiology of Syphilis in New York City. T. Rosenthal and J. Weinstein, New York.—p. 1034.

Scarlet Fever in Negroes.—Cornely discusses the supposed differences in the mortality and morbidity rate from scarlet fever in the white and Negro populations in the South, which has led to the belief that this disease is not common in the Negro and that therefore he is highly resistant to it. This resistance has been attributed to his resistant ectoderm and to a longer racial experience. These two explanations do not seem to hold true when the author's data are considered, which show that although there are great differences in the South there is little inequality in the northern cities in the mortality and morbidity rates from scarlet fever in the two races. If the Negro was highly resistant to this disease, even though his mortality and morbidity in the North and South might not be similar, the disparity between the two races would be just as great in the North as in the South. This the author states has not been shown in his data. Secondly, the idea of racial susceptibility must be discarded when

the results of Dick test surveys of several investigators have shown that there is no significant difference between reactions of white and Negro children to this test. The recorded low mortality and morbidity from scarlet fever in Negroes in the South may be explained on (1) the occurrence of mild and sub-clinical cases which are not recognized and not reported and (2) most of all on the poor reporting of typical cases and deaths in the rural areas of the South, in which almost 70 per cent of the southern Negroes are to be found. That mild and atypical cases of scarlet fever must occur widely in the South draws support from the results of Dick test surveys made in certain tropical countries, which have shown the higher prevalence of negative Dick tests and the earlier appearance of this immunity in children in the tropics. No differences were found between Negroes and white persons. Mayer and Davison have similarly shown that, although in North Carolina the number of cases reported was less than half that in New York City, the rate of susceptibility was much lower than that found in various other comparable groups in the United States. Thus, it must be assumed that there is a wide prevalence of mild and atypical cases in the South.

American Review of Tuberculosis, New York

40: 243-362 (Sept.) 1939

Extrapleural Pneumothorax with Paraffin Filling: Late Results. R. B. McIndoe, Howell, Mich.; J. D. Steele Jr., Milwaukee, and J. Alexander, Ann Arbor, Mich.—p. 243.

*Collapse Therapy of Tuberculosis: Seen from the Point of View of Control of Disease in Community. A. J. Hruby, Chicago.—p. 255.

Management of Pleural Effusions Complicating Artificial Pneumothorax. T. De Cecio and B. P. Potter, Jersey City, N. J.—p. 272.

Transmediastinal Hernia: Mediastinal Movements During Respiration in Bilateral Pneumothorax. M. Finkelstein, Denver.—p. 281.

Precursors of Forlanini and Murphy. L. R. Davidson, Staten Island, N. Y.; M. Fuhrman and V. J. Rella, New York.—p. 292.

Tuberculin Survey of School Children: Method of Case Finding of Adult Type Pulmonary Tuberculosis. E. S. James, Vancouver, B. C.—p. 306.

Growth and Metabolism of Tubercle Bacilli: Role of Source and Proportion of Nitrogen in Medium. R. R. Henley and P. W. LeDuc, Washington, D. C.—p. 313.

Intracutaneous Tuberculosis in Rabbits: Effect of Previous Injury on Lesions of Primary and Secondary Type. W. H. Feldman and F. C. Mann, Rochester, Minn.—p. 336.

Error in Counting Bacilli in Sputum. W. N. Berg, New York.—p. 351.

Collapse Therapy of Tuberculosis.—Hruby reviews the history of the institution of collapse therapy for tuberculosis and its value in the control of the disease in a community, in particular Chicago. Over the six and a half years since the procedure has been carried out in the Municipal Tuberculosis Sanitarium he states that the results in 7,341 cases have been twice as good in the cases so treated as in the controls. Undue attention must not be paid to the mortality tables as an index to the value of collapse. To be fully effective, collapse as a measure of community control of tuberculosis should have widespread and efficient application. Wherever possible the unified plan should prevail, intramural collapse, extramural collapse, reciprocity of function, interchange of patients as between the sanatorium and the field. For the fullest measure of community control this combination is necessary. The field clinic, expensible, inexpensive, elastic in its applicability to the need, should take up the treatment immediately after the patient is dismissed from the sanatorium. The much discussed question of the initial treatment outside the Municipal Tuberculosis Sanitarium does not seem to make a great difference, 70.6 per cent of the patients who received their initial treatment in the clinic are living as against 78.1 per cent for the patients who received their first injection in the Municipal Tuberculosis Sanitarium. The figures embracing 3,090 treated cases explode the belief still current in some quarters that the induction of collapse is purely an institutional prerogative. Owing to its possibilities in the direction of community control, collapse in the Negro deserves more energetic consideration. At present the results for Negroes, while not as good as those for white persons, are considered satisfactory. A gap in the mortality of six to one is reduced to a gap of three to two. The officers and medical personnel of the Municipal Tuberculosis Sanitarium engaged in the study are convinced that collapse, in its dual capacity as public health instrument and medium of cure, symbolizes a union of ends and aims, offering the patient his best chance and the community its best protection.

Archives of Surgery, Chicago

39: 513-690 (Oct.) 1939

- Primary Carcinoma of Male Urethra. H. A. R. Kreutzmann and B. Colloff, San Francisco.—p. 513.
- Pancreaticogastrostomy: Experimental Transplantation of Pancreas into Stomach. E. C. Person Jr. and F. Glenn, New York.—p. 530.
- *Traumatic Subcutaneous Rupture of Normal Spleen. L. T. Wright and A. Prigot, New York.—p. 551.
- Correlation of Pathologic and Clinical Observations in Chronic Lymphoid Appendicitis. C. B. Fausset, New York.—p. 577.
- Capillary Permeability and Inflammation in Narcotized Rabbits. R. D. Cressman and R. H. Rigdon, Nashville, Tenn.—p. 586.
- *Joint Cartilage Under Infraphysiologic, Ultraphysiologic and Euphysiologic Demands. E. Freund, Los Angeles.—p. 596.
- Thyroid Gland: Clinical Pathologic Study, with Special Reference to True Tumor: Analysis of 216 Cases. E. J. Delli Bovi, New York.—p. 624.
- Aseptic Necrosis of Femoral Head Following Traumatic Dislocation: Report of Two Cases. S. Kleinberg, New York.—p. 637.
- Tumors of Small Intestine. S. Cohn, J. A. Landy and M. Richter, New York.—p. 647.
- Partial Agensis of Corpus Callosum: Diagnosis by Ventriclegraphic Examination. A. B. Cass and D. L. Reeves, Los Angeles.—p. 667.
- Removal of Procaine from Cerebrospinal Fluid During Anesthesia. H. Koster, A. Shapiro, R. Warshaw and M. Margolick, Brooklyn.—p. 682.
- Warm Moist Air Therapy for Burns. S. Smith, R. Risk and C. Beck, Chicago.—p. 686.

Traumatic Subcutaneous Rupture of Normal Spleen.—

Wright and Prigot report the thirty cases of subcutaneous rupture of the normal spleen due to trauma observed at the Harlem Hospital from Jan. 1 to Sept. 1, 1938. Operation or necropsy proved that the spleen was the injured organ in these cases and histologic section showed normal splenic tissue. Nine of the patients were from 5 to 10 years of age. Of these, eight were injured in automobile accidents and the ninth by a fall against the curbstone. In the age group from 11 to 20 years there were five patients, of whom only two were struck by automobiles, one was injured while riding in an automobile, one was struck by a bicycle and one was injured while coasting. Alcohol played a prominent part in the injuries of seven patients from 21 to 30 years of age. Three were hurt by falling while drunk, one was involved in an automobile accident while inebriated, two were injured by automobiles and one either fell or jumped from a fourth story window. Two of six patients between 31 and 40 years of age were victims of assault and battery, three were involved in automobile accidents and one fell and injured himself while under the influence of liquor. There were three patients from 43 to 61 years of age and two of these were injured by automobiles and the cause of injury to the third was undetermined. Seven of the thirty patients were women. The diagnosis of subcutaneous rupture of the normal spleen is not easy. There are no signs or symptoms pathognomonic of this condition; therefore each case must be considered on its own merit. The symptoms and signs of rupture of the spleen are chiefly those of local injury and hemorrhage, shock and peritoneal and diaphragmatic irritation. Abdominal pain is the most common complaint. This pain is usually sharp and lancinating and is localized in the left upper quadrant. However, it may be described as generalized abdominal soreness and is sometimes more acute in the other quadrants. All the patients either entered with this symptom or had it while under observation. The symptom next in order of frequency is dyspnea. Eight of the patients complained of being "short winded" or had some form of respiratory distress. Vomiting occurred in three and diarrhea in two. In all cases there were abdominal tenderness and spasm. The trauma which produces the splenic injury may cause contusion of the abdominal wall. In no case were there any external marks on either the abdomen or the back. The erythrocyte count and the value for hemoglobin may be normal, but in all except one case in the series the latter was low, ranging from 40 to 80 per cent. The erythrocyte count ranged from 2,400,000 to 4,400,000 per cubic millimeter. The leukocyte count ranged from 6,000 to 23,850 per cubic millimeter and not infrequently failed to rise with increasing temperatures. The abdominal tap has proved to be of invaluable aid in the diagnosis of subcutaneous injury of the abdominal viscera. If the result is negative but the patient continues to show signs of concealed hemorrhage, it should be repeated. The differential diagnosis must exclude lesions above the diaphragm and retroperitoneal as well as intra-abdominal conditions. The diagnosis is most frequently missed because a history of trauma is not obtained or, if one is obtained, it is

disregarded. Associated lesions may mask the signs and symptoms associated with a ruptured spleen. The treatment of rupture of the spleen is surgical, that is splenectomy. Pre-operative enemas are forbidden. The mortality (thirteen of the thirty patients died, a gross mortality of 43.3 per cent, and seven died without operation, giving an operative mortality of 27.3 per cent) for subcutaneous rupture of the normal spleen is discussed. This mortality the authors believe can be lowered by (1) constant alertness on the part of the surgeon and the staff to avoid errors in diagnosis, (2) more rapid diagnosis so that the patient will receive the benefits of operation sooner, (3) use of a slow blood drip preoperatively with or without intravenous administration of fluids (when blood from a "bank" is not readily available, infusions of a saline solution should be given) and (4) adequate fluids should be given to restore water balance.

Effect of Overactivity and Disuse on Joint Cartilage.

—Freund discusses the behavior of cartilage under ultraphysiologic conditions (increased pressure) and infraphysiologic conditions (disuse). He finds that functional stimuli below or above the physiologic optimum, if active over a long period, are deleterious to joint cartilage. The damage does not remain limited to the joint cartilage in growing persons but draws the bony epiphysis into participation by stopping further endochondral ossification. The time factor is of greatest importance in the development of pathologic changes in the joint cartilages. The pressure force may stay within normal limits; nevertheless, it will damage the joint cartilage if it is continuously active over a long period. The same is true of disuse. Too little or too much use of joint cartilage over a long period is detrimental. This is confirmed by almost every day's operative and necropsy material and does not need proof by animal experimentation. With genu valgum or genu varum, for instance, typically hypertrophic arthritic changes develop in older age. Marginal exostoses and degeneration and fibrillation of joint cartilage will be present at the condyles with increased weight bearing, while atrophy and retraction of joint cartilage are noticed in the condyles with less weight bearing. Whether the pressure force is intense and working over a relatively short period or whether it is within physiologic limits but of protracted or continuous action, the result will be the same: the joint cartilage will lose its normal elasticity and will suffer irreparable damage. With the loss of elasticity, the ways are opened for the different processes of cartilage degeneration, even for reactive resorption from below by bone marrow—all changes preceding and accompanying hypertrophic arthritis. Any definite alteration of function for a long period (infraphysiologic and ultraphysiologic demands) is certain to lead to degenerative changes of joint cartilage and may be followed by the whole syndrome of fully developed arthritis deformans, the more probably the longer the joint is exposed to unphysiologic use.

California and Western Medicine, San Francisco

51: 145-216 (Sept.) 1939

- Some Indications for Roentgen Ray Treatment. U. V. Portmann, Cleveland.—p. 151.
- Water Absorption from Colon and Its Relation to Motility. K. M. Bonoff, Los Angeles.—p. 154.
- Pharyngo-Esophageal Diverticula: Modified Technic for One-Stage Operation. J. H. Shephard, San Jose.—p. 156.
- *Gonadotropic Hormone of Pregnant Mares' Serum: Its Clinical Use in Gynecology. G. J. Hall, Sacramento.—p. 159.
- Sulfanilamide and Sulfapyridine in Treatment of Various Infections: Factors Influencing Prognosis in Pneumonia. C. S. Keefer, Boston.—p. 163.
- Urinary Tract Infections in the Newborn. W. M. Happ, Beverly Hills, Calif.—p. 166.

Gonadotropic Substance in Gynecology.—Hall used equine gonadotropic substance in 135 cases of various gynecologic disorders. Of the patients with menstrual disturbances 57.6 per cent were cured, 47 per cent of those with genital hypoplasia were cured and twenty-four of the forty-three (55.8 per cent) who were treated for sterility became pregnant. A number of the patients necessarily fall into more than one group. For example, a patient whose primary complaint was sterility may also have had associated dysmenorrhea or hypomenorrhea, and one who complained of the subjective symptoms of estrogenic deficiency might also have had genital hypoplasia, dysmenorrhea or oligomenorrhea.

Endocrinology, Los Angeles

25: 337-490 (Sept.) 1939

- Assay of Progesterone by Production of Artificial Pregnancy-Response of Feline Uterus. H. B. Van Dyke, New Brunswick, N. J., and J. S. Chen, Peking, China.—p. 337.
- *Effect of Prolactin on Mammary Gland Secretion. H. L. Stewart Jr. and J. P. Pratt, Detroit.—p. 347.
- *Observations on Adrenalin Level in Blood Serum During Insulin Hypoglycemia and After Metrazol Convulsions. Gert Heilbrunn and E. Liebert, Elgin, Ill.—p. 354.
- Estrogen-Progesterone Induction of Mating Responses in Spayed Female Rat. J. L. Boling and R. J. Blandau, Providence, R. I.—p. 359.
- Induction of Mating and Ovulation in Cat with Pregnancy Urine and Serum Extracts. W. F. Windle, Chicago.—p. 365.
- Technic for Hypophysectomy of Pigeons. J. P. Schooley, Cold Spring Harbor, N. Y.—p. 372.
- Influence of Prolonged Etherization, Trauma and Hemorrhage on Survival Period of Adrenalectomized Rats. R. S. Weiser and Helen Knott, Seattle.—p. 379.
- Studies on Respiration of the Newt: II. Effect of Temperature in Hypophysectomized, Immature, Thyroidectomized and Pancreatectomized Males. C. M. Pomeroy, Cambridge and Worcester, Mass.—p. 385.
- Studies on Inhibitory Hormone of Testes: II. Preparation and Weight Changes in Sex Organs of Adult Male White Rat. B. Vidgoff, R. Hill, H. Vekrs and Rosa Kubin, Portland, Ore.—p. 391.
- Effect of Castration on Body Weight and Length of Male Albino Rat. H. S. Rubinstein, A. R. Abarbanel and A. A. Kurland, Baltimore.—p. 397.
- Study of Muscular Efficiency in Rats Injected with Anterior Pituitary Growth Factor. E. B. Plattner and C. I. Reed, Chicago.—p. 401.

Effect of Prolactin on Mammary Secretion.—The nursing history and breast secretion of 380 consecutive nursing mothers were recorded by Stewart and Pratt for the first ten postpartum days. Of the 380 mothers, 333 nursed their babies; 207 were full-breast nursing, seventy were part-time nursing and fifty-six deficient nursing. Of the fifty-six deficient lactating mothers only twenty-four expressed their desire to nurse the baby for at least six weeks, to receive injections of prolactin in an attempt to improve the milk supply and to pump the breasts every four hours for a minimum of five days (from the fifth to the ninth postpartum day). Ampules of identical appearance containing 5 cc. of solution to be injected daily were differentiated by the labels 68A and 60A. The contents of these ampules remained unknown until the study was concluded. After the results were tabulated, it was learned that ampules 68A contained 1,000 pigeon units (Riddle) of lactogenic hormone. Ampules 60A contained no hormone. In addition to the deficiency cases, ten part-time nursing mothers were studied. The average daily milk secretion of 184 cc. on the fifth postpartum day of fourteen deficient mothers receiving prolactin increased to 212 cc. the following day. There was a decrease in seven of the fourteen cases on the seventh day, the average output falling to 205 cc. From the seventh to the ninth day there was a progressive increase to 258 cc. The average total gain during the entire period was 74 cc. In relation to the amount secreted on the fifth day, this represents a gain of 40 per cent. In three women the milk production was less on the ninth than on the fifth day. None of this group were discharged with full-breast nursing. Ten mothers receiving the control solution showed a gradual rise from an average breast secretion of 219 cc. on the fifth day to 311 cc. on the ninth day. The total average gain during this period was 92 cc., or 42 per cent. In two the amount of milk produced on the ninth was less than on the fifth day. No mother in this group was discharged with full-breast nursing. The average gain of primipara and multipara was 88 cc. (42 per cent) and 81 cc. (44 per cent) respectively. In the ten women in whom the breasts were pumped every four hours and the baby did not nurse, the average gain was 71 cc., or 43 per cent. In fourteen the breasts were pumped immediately after the baby nursed; in these the average gain in milk secretion was 89 cc., or 39 per cent. The average secretion on the fifth day of fourteen mothers less than 30 years of age was 215 cc. It increased to 325 cc. on the ninth day. In ten mothers more than 30 years of age the average output on the fifth day was 176 cc. On the ninth day it was 227 cc. All twenty-four deficiency cases were seen at the end of six weeks. Ten mothers in the prolactin and control groups had dried up the breasts because of insufficient milk supply. Those who had received prolactin showed no significant increase of milk secretion over the control group. Part-time nursing mothers whose milk production on the fifth day was more than 300 cc. produced a greater average increase of milk secretion than the deficiency group. This series averaged 341 cc. on the fifth day and showed a progressive daily rise to 450 cc. on the

ninth day. The total average increase of 109 cc. was greater than either the control or prolactin cases in the deficiency group. The percentage increase, however, was less (31 per cent). Multiparas showed a greater increase than primiparas. The two mothers in this group discharged with full-breast nursing were multiparas.

Blood Epinephrine After Insulin Hypoglycemia and Metrazol.—Heilbrunn and Liebert determined the activity of epinephrine and epinephrine-like substances in the blood serum in patients during various hypoglycemic states. The curves of those patients evidencing shock showed an inadequate adrenal response to insulin ninety minutes after the injection, while the nonshock curves displayed a marked rise in the epinephrine level of the blood at this time. The epinephrine output of a third group was dependent on the muscular movements; this was confirmed by observations on the epinephrine level of the blood serum after metrazol convulsions. The epinephrine level reflected directly the various stages of insulin hypoglycemia. At the time of deep coma the epinephrine level was low, while it rose to a high level at the time of recovery.

Iowa State Medical Society Journal, Des Moines

29: 427-478 (Sept.) 1939

- Ocular Disorders Due to Exogenous Toxemia. W. L. Benedict, Rochester, Minn.—p. 427.
- Diagnosis and Management of Carcinoma of Breast. N. F. Hicken, Salt Lake City.—p. 430.
- Respiratory Allergy: Survey of 283 Consecutive Cases Seen in Office Practice from July 1937 to December 1938. L. J. Halpin, Cedar Rapids.—p. 439.
- Perennial Type of Nasal Allergy. J. E. Reeder, Sioux City.—p. 446.
- Status of Ophthalmologists and Otolaryngologists in a State Medical System. S. B. Chase, Fort Dodge.—p. 448.
- Uses of Benzedrine Sulfate in General Practice. R. L. Gorrell, Clarion.—p. 451.
- Recurrence of Undulant Fever Following Sulfonamide Therapy. M. C. Schroeder, Monroe.—p. 453.

Journal of Lab. and Clinical Medicine, St. Louis

24: 1227-1338 (Sept.) 1939. Partial Index

- *Influence of Vitamin D on Serum Phosphatase Activity in Arthritis. P. W. Smith, A. D. Klein and I. E. Steck, Chicago.—p. 1227.
- Neural Depressing Effect of Trichlorethylene. H. S. Rubinstein, E. Painter and O. G. Harne, Baltimore.—p. 1238.
- Mechanism of Gold Therapy in Rheumatoid Arthritis. D. H. Kling, Los Angeles; D. Sashin and J. Spanbock, New York.—p. 1241.
- Antigenic Properties of Streptococci Killed by Ultraviolet Light. M. Murray, Cincinnati.—p. 1245.
- *Basal Metabolic Rate of Normal Individuals in New Orleans. A. G. Eaton, New Orleans.—p. 1255.
- Hemolysis Produced by Staphylococcus Colonies and Toxin on Agar Mediums Containing Various Animal Bloods. R. H. Rigdon, Nashville, Tenn.—p. 1264.
- *Estrogenic and Chorionic Gonadotropic Hormone in Normal Pregnancy and in Toxemia of Pregnancy. S. L. Siegler, Brooklyn.—p. 1277.
- Sulfapyridine in Blood of Guinea Pigs After Oral Administration. A. R. Armstrong and D. R. Muirhead, Hamilton, Ont.—p. 1281.
- Determination of Vitamin C in Urine. H. N. Holmes and Kathryn Campbell, Oberlin, Ohio.—p. 1293.

Vitamin D and Serum Phosphatase in Arthritis.—Smith and his co-workers determined the serum phosphatase activity after prolonged medication with vitamin D in cases of atrophic and hypertrophic arthritis and concluded from their study that serum phosphatase activity does not promise to be of value as a diagnostic aid in arthritis as there is a wide distribution of values above, below and within the normal range. The possibility of its value as an aid in differentiating between the atrophic and hypertrophic types is again negated by the wide distribution, regardless of the somewhat higher average that was obtained in a limited number of hypertrophic cases. Also there is a possibility that the shift in the serum phosphatase activity, observed to occur in patients who have ultimately benefited from vitamin D, might prove to constitute a basis for prediction as to the suitability of such therapy. Further investigation is needed.

Metabolism of Normal Individuals in New Orleans.—As a practical result of comparing the four commonly used standards for determining the metabolic rates in ninety-eight women and sixty-two men (apparently normal students and staff of the Louisiana State University) Eaton arrived at a set of corrections which may be applied to existing standards in predicting the basal heat production of individuals in New Orleans and, it is hoped, in other parts of the deep South. He proposes to employ a correction factor of —10 per cent to all

values of the Aub and Du Bois standards or — 11 per cent for men and — 7 per cent for women to the recent Mayo Foundation standards. These corrections are shown to be valid statistically. The cause of the lowered basal metabolic rate in warm climates has been discussed by many investigators. It is a fact that metabolism is somewhat proportional to the average annual temperature, although the relationship cannot as yet be expressed as a linear function. Lessened desire for strenuous physical exertion and greater ability and desire for relaxation must be considered as probable factors in lowering the metabolic rate. Whatever the cause may be, the lowered basal heat production lessens the strain on the heat-eliminating mechanism and makes life more comfortable in a subtropical climate, especially during hot humid nights, when heat is so difficult to dissipate. The mechanism by which this adaptation is brought about is as yet obscure.

Hormones in Pregnancy.—Siegler presents the quantitative determination of the total estrogenic and chorionic gonadotropic hormones in five normal pregnancies and in one case of toxemia of pregnancy, which toxemia was alleviated by the administration of large doses of estradiol benzoate. An average gradual increase in the total estrogenic hormone eliminated was observed in the five normal cases of pregnancy, from 3,500 rat units per liter of urine on the thirtieth day following the first missed menstrual period, reaching a peak at term of 82,000 rat units, after which there was an abrupt decline of the concentration of the total estrogenic hormone to 2,200 rat units on the first postpartum day to 200 rat units on the fourth postpartum day. The lowest amount excreted on the thirtieth day was 1,800 and the highest 4,800 rat units. The lowest concentration at term was 70,000 and the highest 100,000 rat units. Conversely, in the determination of the chorionic gonadotropic hormone there was a sudden increase from 7,500 mouse units per liter on the fourteenth day after the first missed menstrual period to its peak of 140,000 mouse units on about the thirtieth day. Thereafter there was an abrupt decline, with a level below 10,000 mouse units after the sixtieth day to an average of about 4,500 mouse units to the termination of pregnancy, becoming negative on the fourth postpartum day. The lowest concentration in the first two weeks following the first missed menstrual period was 4,500 and the highest was 15,000 mouse units. The lowest amount at the peak was 96,000 and the highest was 210,000 mouse units. In the several instances in which the serum had been used in the assaying of the total estrogenic and gonadotropic hormones, the amounts estimated coincided with those found in the urine. The hormone determination in the case of toxemia of pregnancy showed a rise in the amount of gonadotropic hormone in the fifth and sixth months. An increase in blood pressure, the presence of albuminuria and edema in the following month with a higher level of gonadotropic hormone concentration, and a subnormal amount of total estrogenic hormone followed. These higher levels persisted with the severe toxemic symptoms until estradiol benzoate was given. Following this the level of gonadotropic hormone fell to almost normal, the level of the total estrogenic hormone rose in amount and the toxemic symptoms subsided.

Kansas Medical Society Journal, Topeka

40: 361-404 (Sept.) 1939

- Treatment of Gastric and Duodenal Ulcer. W. Walters, Rochester, Minn.—p. 361.
The Approach Years. W. S. Horn, Fort Worth, Texas.—p. 368.
Treatment of Paroxysmal Tachycardia with Apomorphine. G. E. Finkle, McPherson.—p. 372.
Treatment of Intractable Pain. D. F. Coburn, Kansas City.—p. 373.
Sinus Trouble and Its Nonoperative Treatment. W. B. Granger, Emporia.—p. 375.

Nebraska State Medical Journal, Lincoln

24: 321-360 (Sept.) 1939

- Organic Background of Mind. F. Kennedy, New York.—p. 321.
Fractures of Hip: Plea for Internal Fixation. A. F. O'Donoghue, Sioux City, Iowa.—p. 329.
Present Day Trends in Anesthesia. S. D. Miller, Lincoln.—p. 334.
Pain Relief in Normal Labor and Operative Obstetrics. R. M. Grier, Evanston, Ill.—p. 338.
New and Effective Support for Joints. W. L. Sucha, Omaha.—p. 342.
Clinical Recognition and Treatment of Thyroid Deficiency States and Other Disorders of Hypometabolism. J. F. Gardiner, Omaha.—p. 345.
Rheumatic Fever in Nebraska. E. Thompson, Omaha.—p. 347.
Diseases of Chest from Point of View of Bronchoscopist. H. E. Kully, Omaha.—p. 350.

Philippine Islands Med. Association Journal, Manila

19: 395-466 (July) 1939

- Inversio Uteri: Report of Eleven Cases. H. Acosta-Sison and N. D. Mendiola, Manila.—p. 395.
The Health of Our Citizen Army. V. Luna, Manila, and J. Salcedo Jr., Baguio.—p. 403.
Development of Parenchymatous Diseases of Liver. H. Kaunitz, Manila.—p. 415.
Biologic Assay (Rat Growth Method) of Syrup Preparation of Vitamina B₁. S. G. Jaco, Manila.—p. 427.

Rocky Mountain Medical Journal, Denver

36: 605-684 (Sept.) 1939

- Prolonged Labor. C. B. Ingraham, Denver.—p. 622.
What Should We Do to Improve Medical Facilities and Care? L. E. Viko, Salt Lake City.—p. 626.
Office Treatment of Common Rectal Disorders. V. G. Jeurink, Denver.—p. 629.
State Medicine, the Social Menace. L. E. Likes, Lamar, Colo.—p. 633.
Presentation of Bronze Tablet to the Medical School of the University of Colorado by the Denver Clinical and Pathological Society, in Memory of Dr. Henry Sewall. C. Powell, Denver.—p. 638.

Virginia Medical Monthly, Richmond

66: 513-574 (Sept.) 1939

- Hospital Care for Indigent and Low Income Group: Plan for Subsidizing Accessories of Medicine. W. B. Martin, Norfolk.—p. 513.
Plan for Relieving the Burden of Medical Costs. J. Hundley Jr., Lynchburg.—p. 516.
Significance of Abdominal Pain in Children. T. D. Jones, Richmond.—p. 518.
*Report on Use of Sodium 5, 5-Diphenyl Hydantoin in Fourteen Selected Cases of Epilepsy at the Virginia State Colony for Epileptics and Feeble-minded. O. M. Weaver, D. L. Harrell Jr., and G. B. Arnold, Colony.—p. 522.
Aphthous Stomatitis Treated with Sulfanilamide: Report of Two Cases. J. L. Lane, Rocky Mount, N. C., and P. P. Vinson, Richmond.—p. 528.
Acute Encephalitis Without Apparent Cause. S. Newman and F. H. McGovern, Danville.—p. 529.
Addison's Disease with Failure of Cortical Extract Therapy: Case Report. H. G. Hadley, Washington, D. C.—p. 530.
Abdominal Pain Complicating Pregnancy. G. J. Levin, Norfolk.—p. 530.

Sodium Diphenyl Hydantoin for Epilepsy.—Weaver and his associates used sodium 5, 5-diphenyl hydantoin in the treatment of fourteen epileptic patients, who received the drug for periods of from two weeks to three months. Eight of the patients have been definitely benefited, six of them especially so. The results in the other six have proved so adverse that it was necessary to discontinue the treatment. Nine of the patients had a diminution in the number of their convulsions; two had a reduction in the severity of their convulsions. The general mental condition of six improved. There was a definite improvement in the postconvulsive state in three of the patients. A marked improvement in personality ensued in two. The numerous psychotic episodes disappeared in one patient who had had them. Two patients made gains in weight. One patient developed a rather unusual—certainly for her—state of well being. The two patients who were most improved were receiving phenobarbital in addition to the other drug. This suggests synergistic action. As to the unfavorable results, six patients were extremely drowsy for from two to six weeks after medication with the drug. Three suffered profound psychic distress. Three had an increase in the number of their seizures. Three complained of persistent and severe headache. A severe cutaneous reaction developed in five patients; in two of these this was complicated by edema of the face. These reactions disappeared on temporary withdrawal of the drug (though in two cases there was a later recurrence). One patient, who had been having only a few grand mal convulsions a month, began to have frequent and numerous petit mal convulsions. One patient who had never before been incontinent became so after receiving the drug for several weeks. One patient had an acute abdominal crisis that simulated acute appendicitis. One patient had a severe gastritis and diarrhea. Loss of appetite occurred in two. It is a powerful drug and appears to be more toxic and dangerous than phenobarbital. In their opinion the patient receiving the drug should be under the physician's constant observation. In the cases that were benefited the improvement was not solely a diminution in the frequency and a lessening in the severity of the seizures (that could quite probably have been brought about by massive doses of phenobarbital, bromides or chloral) but in several cases a rather remarkable improvement in the patient's personality, behavior and mental alertness occurred. The drug should be regarded as valuable for the treatment of convulsive disorders.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

62: 227-340 (Sept.) 1939

- *Acute and Subacute Necrotic Myelitis. J. G. Greenfield and J. W. A. Turner.—p. 227.
- Some Observations on Central Pain. D. Kendall.—p. 253.
- Venous Drainage of Brain, with Special Reference to Galenic System. B. Schlesinger.—p. 274.
- Neurologic Sequelae of "Kerüfiterus." G. M. Fitz Gerald, J. G. Greenfield and B. Kounine.—p. 292.
- False Diverticulum of Lateral Ventricle Causing Hemiplegia in Chronic Internal Hydrocephalus. D. W. C. Northfield and Dorothy S. Russell.—p. 311.
- Abnormal Cortical Potentials Associated with High Intracranial Pressure. D. Williams.—p. 321.

Acute and Subacute Necrotic Myelitis.—Greenfield and Turner report three cases of necrotic myelitis and assert that clinically the cases of necrotic myelitis fall into two distinct groups: the acute group, which they illustrate by one case, and a subacute group, represented by the original two cases. Acute necrotic myelitis shows itself by a rapid destruction of function of the spinal cord in the lumbar and sacral segments, with, at least in their case, a fairly rapid ascent of the signs to the lower dorsal segments. Owing to the rapidity of disturbance of function of the cord a flaccid paraplegia develops, and in none of the recorded cases has there been any sign of recovery from this. In the subacute type the disease is of gradual onset and slowly progressive course, usually without any remission, though in one case there was some recovery of power in the legs for from two to three months. The presenting symptom is usually weakness of the legs, though this may be preceded by severe pain in the distribution of the sacral segments or by dysesthesia in the lumbar and sacral areas. The differential diagnosis of acute necrotic myelitis presents considerable difficulty. While syphilitic transverse myelitis may be excluded by a negative Wassermann reaction, other types of acute myelitis, especially those due to the demyelinating diseases, are likely to cause confusion. The demonstration of a spinal subarachnoid block is the most valuable distinguishing feature between cases of spinal compression due to epidural abscess or Pott's disease and those of acute necrotic myelitis. In the differential diagnosis of subacute necrotic myelitis both amyotrophic lateral sclerosis and subacute combined degeneration may cause some difficulty in the early stages of the disease, but the development of sphincter disturbance and sensory changes will soon exclude the former, and the absence of dysesthesia in the hands and the normal blood count and gastric analysis the latter. Chronic meningovascular syphilis affecting the lumbosacral cord has to be excluded. The most difficult differential diagnosis is the differentiation from extramedullary or intramedullary tumors in the lumbosacral region of the cord. The two main differential points are the frequent occurrence of root pains and pain in the back in extramedullary tumors, and gradual ascent of the sensory level, which is usual in cases of subacute necrotic myelitis and rare in cases of tumor. The presence of subarachnoid block at lumbar puncture will settle the diagnosis, since tumors at this level are invariably associated with some degree of spinal block. Pathologically necrotic myelitis consists essentially of primary obliterative sclerosis of the small intramedullary and meningeal vessels in the lower segments of the spinal cord and is associated with great thickening of the walls of the larger meningeal veins and sometimes also of the larger arteries. The degeneration of the parenchyma of the spinal cord appears to be altogether secondary to the vascular lesion.

British Journal of Ophthalmology, London

23: 585-648 (Sept.) 1939

- Paraneuritic Syphilitic Keratitis and Syphilitic Atrophy of Optic Nerve Treated with Sulfosin. V. Larsen.—p. 585.
- Unusual Condition of Posterior Surface of Cornea (Posterior Herpes of Cornea). L. Staz.—p. 622.
- Studies on Bacteriology of Hypopyon Ulcer: III. Bacteriologic Investigation of 120 Cases of Hypopyon Ulcer. A. J. Rhodes.—p. 627.
- Infantile Dacryocystitis Treated by Surgical Diathermy. A. M. MacGillivray.—p. 630.
- Rotating Cross Cylinder. M. Tree.—p. 632.

British Medical Journal, London

2: 593-630 (Sept. 16) 1939

- Hydatid Disease: Errors in Teaching and Practice. L. Barnett.—p. 593.
- Nonopaque Ureteric Calculi. J. C. Ross.—p. 599.
- Etiology and Treatment of Spasmodic Flatfoot. A. H. Todd.—p. 602.
- Treatment of Leg Fracture Casualties in Central China War Zone. W. G. Brown.—p. 604.

Irish Journal of Medical Science, Dublin

No. 165: 645-716 (Sept.) 1939. Partial Index

- Congenital Heart Disease in General Practice. P. T. O'Farrell.—p. 645.
- Hematology in General Practice. D. Mitchell.—p. 664.
- Some Obstetric Hemorrhages. R. M. Corbet.—p. 669.
- Prevention and Treatment of Fevers. C. J. McSweeney.—p. 673.
- Some Aspects of Medical Jurisprudence in Relation to Practice. D. A. MacErlan.—p. 684.
- Treatment of Fluid in Thoracic Cavity. E. T. Freeman.—p. 691.
- Clinicopathologic Demonstration: Pathology of Heart Failure. W. Boxwell.—p. 698.
- Deep X-Ray Therapy in Prostatic Enlargement. R. A. Stoncy.—p. 704.

Journal of Hygiene, London

39: 471-596 (Sept.) 1939. Partial Index

- Some Observations on Reversed Anaphylaxis. M. van den Ende.—p. 471.
- *Subjective Impressions of Freshness in Relation to Environmental Conditions. T. Bedford and C. G. Warner.—p. 498.
- Effects of Morphine, Diacetylmorphine and Some Related Alkaloids on Alimentary Tract: Part III. Cecum and Colon. G. N. Myers.—p. 512.
- Some Observations on Classification of Enterococci. N. C. Graham and Eileen O. Bartley.—p. 538.
- *Weil-Felix Reaction in Trachoma. R. Kirk, A. R. McKelvie and A. D. Drysdale.—p. 553.
- Further Observations on Relation of Decline in Number of Horse-Drawn Vehicles to Fall in Summer Diarrhea Death Rate. G. S. Graham-Smith.—p. 558.
- Sulfanilamide Treatment of Scarlet Fever. Jane O. French.—p. 581.

Freshness in Relation to Environment.—According to Bedford and Warner the requirements for a pleasant and invigorating environment can be stated: 1. A room should be as cool as is compatible with comfort, since freshness tends to increase as the temperature is reduced. 2. There should be adequate air movement. During the winter season the air velocity in the ordinary factory averages about 30 feet per minute and in the majority of cases lies between 20 and 40 feet per minute. At velocities much below 20 feet per minute feelings of stuffiness are likely to arise. In summer weather or in hot factories velocities rather higher than those mentioned are desirable. 3. The air movement should be variable rather than uniform and monotonous. The body is stimulated by ceaseless change in the environment. Outdoors one is braced by the changing play of the wind, and likewise the variations of air movement which may be encountered indoors exert an invigorating effect. When ventilation is obtained through open windows the air movement is likely to be variable, but with some mechanical ventilating systems the air movement is undesirably monotonous. In mechanical installations the air inlets should be so designed and the velocity of discharge so arranged that suitable eddying currents are set up. 4. The relative humidity of the air should be kept reasonably low. It should not exceed 70 per cent and should preferably be much below that value. 5. The average temperature of the walls and other solid surroundings should not be appreciably lower than that of the air and should rather be warmer. The combination of cold walls and warm air often causes a feeling of stuffiness. 6. The air at head level should not be distinctly warmer than that near the floor, and the heads of the occupants should not be exposed to excessive radiant heat. 7. The air should be free from objectionable odors.

Weil-Felix Reaction in Trachoma.—Various workers in different countries claim that in serums from patients with trachoma a positive Weil-Felix reaction is found and regard this as evidence that the causal agent of trachoma is a Rickettsia. Kirk and his colleagues therefore examined 200 serums from Sudanese patients with trachoma and state that the study failed to reveal any significant differences with regard to the Weil-Felix reaction between them and twenty-two serums from non-trachomatous controls or 1,000 serums taken, without reference to trachoma, from a large and representative section of the population. Clinical and serologic evidence suggests that typhus is absent from the Sudan. For this reason the interpretation of results is less liable to confusion in the Sudan than in countries in which positive Weil-Felix reactions may occur in a varying proportion of the population, owing to typhus infections.

Annales de Dermatologie et de Syphiligraphie, Paris

10: 641-736 (Aug.) 1939

Diabetes Insipidus in Course of Sarcoid of Boeck. M. Jersild.—p. 741.
Tuberculous Sclerosis of Bourneville and Symmetrical Fibromatous Nevus of the Face. J. Watrin, P. Meignan and R. Weille.—p. 644.
*Dermatitis of "Laundresses": Role of Chromium and Chlorine (in France). H. Rabeau and Mlle. Ukrainczyk.—p. 656.
Specific Syphilitic Balanitis. J. Follmann.—p. 681.
Peculiar Form of Leukonychia: Leukonychia in Wide Longitudinal Band. J. Ferreira Marques.—p. 688.

Dermatitis of Laundresses.—In a review of the literature on the "dermatitis of laundresses" Rabeau and Ukrainczyk show that especial attention has been directed to the important part played by alkaline substances in the pathogenesis of occupational dermatitides. Alkaline substances produce an alteration of the epidermis which in turn predisposes to sensitization. Thus soaps have not only an irritating but also probably an eczematogenic action. As a result of their dissolving effect on the fats of the skin, the alkaline substances prepare the way for sensitization. Experiments demonstrated that there are persons who are sensitive to alkaline substances and who lack the capacity to neutralize them when they are applied to their skin. This deficiency has been found in 8 per cent of normal subjects and in 90 per cent of patients with eczema. Some investigators believe that sodium hypochlorite can elicit allergic conditions and the authors determined that there is another important factor of sensitization, namely chromium compounds. In studies on the frequency of sensitivity for Javelle water, which is used widely in France for purposes of cleaning and disinfecting in households and for bleaching in various industries, the authors used cutaneous tests as well as a palpebral test. They found the palpebral test especially helpful in that it revealed sensitizations not detectable by the usual methods. The patient closes his eyes and a specimen of the substance to be tested is applied to one of the eyelids. The reaction is read after twenty-four hours. The authors describe studies on the eczematogenic power of the different substances used in laundering on patients sensitized to Javelle water and to bichromates. These studies demonstrated the absolute parallelism of these sensibilizations and the eczematogenic action. In studies and observations on different types of Javelle water it was observed that the sensitization apparently depends on the presence of bichromates. The authors gained the impression that the intolerance for chromium precedes that for chlorine. They were able to collect 200 patients presenting this double intolerance to chlorine and chromium. The following occupations were represented: housekeepers, employes of hotels and restaurants, laundresses, cement workers, mechanics, pharmacists and physicians; moreover, there were patients in whom the sensitization could be traced to cosmetics such as powders containing lead bichromate. It was found that solution of chlorinated soda and black soap are not tolerated by the patients with double sensitization. The authors think that this is due to the fact that solution of chlorinated soda is often wrongly prepared from Javelle water and a little Javelle water is occasionally added to black soap. They rarely observed chemical intolerance to substances other than bichromates and hypochlorites. They stress the social importance of the dermatitis produced by Javelle water, pointing out that they occur in different occupations and that they may be of long duration.

Journal de Médecine de Lyon, Lyons

20: 475-502 (Aug. 20) 1939

*Amebiasis and Cancer of Large Intestine. A. Cade and M. Milhaud.—p. 475.
Cancer of Stomach in Young Subjects. L. Bouchut, M. Levrat and J. Philippe.—p. 481.
Angina Pectoris of Digestive Origin. C. R. Bocca.—p. 487.

Amebiasis and Cancer of Large Intestine.—Cade and Milhaud demonstrate that from the diagnostic point of view the relations between cancer of the large intestine and amebiasis present three different aspects: (1) cancer can simulate amebic dysentery, (2) chronic amebiasis can assume a pseudocancerous form and (3) cancer and amebiasis may coexist. As regards the concurrence of amebiasis and cancer, the authors consider two possibilities: either cancer may appear sooner or later after amebic infestation or, in a patient with neoplasm, examination of the feces may reveal the pathogenic amebas of dysentery.

The authors describe two cases of association of amebiasis and cancer which illustrate these two eventualities. In one case the neoplasm was localized on the transverse colon, in the other case in the rectosigmoid. The authors show that an exact diagnosis is of great importance, since if cancer is present extensive and early excision is necessary. A reliable diagnosis will be derived from the results of rectal palpation, of roentgenologic examination and of rectosigmoidoscopy, complemented if possible by biopsy. Digital examination of the rectum permits the detection of indurated, irregular and perhaps painful masses. The hardness is generally greater in cancer than in amebiasis, as is also the adherence to the base and the tendency to bleeding. Nevertheless the tactile examination may be confusing, especially if the tumor is located high up. It is advisable to complement it by rectosigmoidoscopy. The latter procedure is indispensable if digital examination of the rectum is negative. If after rectoscopy there is still uncertainty, biopsy should be done. Roentgenoscopy is valuable particularly in cancers situated high up, which escape digital examination and even rectosigmoidoscopy. Trial treatment with emetine and arsenical substances may also furnish valuable information.

Presse Médicale, Paris

47: 1309-1324 (Sept. 2) 1939

*Medical Treatment in Suppurative Nontuberculous Pleuritis. P. Lévy-Valensi, S. de Sèze and J. Pinès.—p. 1309.
Gas Masks and Correction of Ametropias. Cot, Moynier, Genaud and Robert.—p. 1311.

Suppurative Nontuberculous Pleuritis.—Lévy-Valensi and his associates treated five patients between 29 and 59 years of age who had high fever in consequence of streptococcal pleuritis, evidenced on puncture. Peroral dosage with carboxyl-sulfamidochrysoidin varied from eight tablets of 0.2 Gm. each administered daily to twelve (2.4 Gm.). Treatments lasted from seventeen days to six weeks with progressive determinations of increasing sterility. In two cases pachypleuritis was roentgenologically established at the time of discharge from the hospital. In their discussion of sulfonamide derivatives used in antibacterial chemotherapy the authors favor those belonging to the azo coloration group over the white because of their freedom from toxicity and accidents, especially in streptococcal pleuritis. The authors recommend early treatment with sufficiently high dosage from the beginning, according to the drug employed. Daily treatment should be continued until successive punctures show complete asepsis of the interpleural fluid and a negative culture response. They do not favor simultaneous peroral, intramuscular and intrapleural dosing with sulfonamide derivatives or serous and vaccinal therapy but recommend cardiac tonics and cardiovascular analeptics and systematically continued puncture tests. For precautionary purposes they advise that the patient be kept in bed for from eight to ten days after suspension of treatment, with resumption of dosing at one third strength for another week. Repeated clinical and x-ray examinations may indicate residual pachypleuritis. To overcome this an open air convalescence and breathing exercises methodically pursued are indicated.

Schweizerische medizinische Wochenschrift, Basel

69: 781-804 (Sept. 2) 1939. Partial Index

Use of Sulfapyridine in Internal Medicine. F. Seicounoff and R. Junet.—p. 781.
Treatment of Pneumonias with Pyridine Sulfanilamide. F. Buser.—p. 783.
*Effect of Rectally Administered Insulin Suppositories in Diabetic Patients. F. Wuhmann.—p. 787.
Use of Milk from Collecting Depots for Human Milk for Feeding of Nurlings. P. Feldweg.—p. 789.

Insulin Suppositories for Diabetic Patients.—Wuhmann directs attention to experiments with the rectal administration of insulin suppositories which Brahn and Langner reported in the *Nederlandsch Tijdschrift voor Geneeskunde* 83:3784 (July 29) 1939, abstracted in THE JOURNAL October 14, page 1525. In view of the possible practical significance of this rectal administration of insulin, Wuhmann decided to try it in cases of diabetes. He studied the blood sugar curves of fourteen diabetic patients and of four persons without metabolic disorders, following the rectal administration of insulin suppositories. The rectal administration of the insulin suppositories was combined with a sugar tolerance test, and the

blood sugar values were determined before and for a certain period after. More than fifty blood sugar curves of diabetic patients were studied and eleven of the persons who were free from metabolic disorders. Since the rectal administration of glandular preparations requires much larger doses than does the subcutaneous injection, the author designated 10 injection units as 1 suppository unit. Thus, a 20 unit insulin suppository contains 200 injection units. Since larger doses are required, the author thinks that less refined forms of insulin can be employed for rectal application, in that for instance the presence of protein substances does not constitute a hindrance in this form of administration. He reproduces only a few of the blood sugar curves which he obtained in the course of his studies. He reaches the conclusion that measurable and effective quantities of insulin can be introduced by means of rectal suppositories. However, he thinks that the extensive use of insulin suppositories in the practical therapy of diabetes mellitus will require further clinical investigation.

Archiv für Gewerbepathologie, Berlin

9: 407-508 (July 12) 1939. Partial Index

- Fatal Subacute Industrial Lead Poisoning. W. Ehrhardt.—p. 407.
Demonstration in Pulmonary Tissue of Dust Containing Silicic Acid by Means of Fluorescence Microscopy. Margarete Oberdahoff.—p. 435.
*Occurrence of Occupational Manganese Intoxication in Steel Industry. H. Voss.—p. 453.
Progressive Bulbar Paralysis and Amyotrophic Lateral Sclerosis After Chronic Manganese Poisoning. H. Voss.—p. 464.
Ocher Dust Lung. H. Otto.—p. 487.
Examination of Lung with Chromium Silicosis. E. Lettner.—p. 496.

Occupational Manganese Intoxication in Steel Industry.—Reviewing the cases of manganese poisoning that have been reported in the literature, Voss demonstrates that, in comparison to the wide technical use of manganese and its compounds, the number of occupational manganese intoxications is small. As explanations for this the author suggests that apparently only a small number of persons have the predisposition for manganese poisoning, that not all manganese compounds are capable of exerting a toxic action in the organism, and that danger of occupational poisoning exists only where manganese or manganese compounds are inhaled or swallowed in adequate quantities and for a comparatively long period. Small quantities of manganese, such as are used in the ceramic industry in the preparation of lacquer and in the dye and glass industries, apparently are not sufficient to elicit chronic manganese intoxication. Impairments of the central nervous system by manganese have hitherto been observed in persons engaged in the mining of manganese ores, in the sorting and handling of ores containing manganese, in the processing of pyrolusite (manganese dioxide) and in those who come in contact with manganese vapors or who work with metallic manganese. In the steel industry manganese intoxications may be produced not only by manganese vapors but also by the dust of ferromanganese. The author reports the clinical history of a man, aged 33, who for ten months had worked part of the time and for seventeen months all of the time in a deficiently ventilated room, tending a number of ferromanganese grinders. For more than two years the man felt well, but after that the typical symptoms of manganism developed: masklike face, amyostatic symptoms, disturbances in speech and walk, micrographia, compulsory weeping and laughing, stuttering, and disturbances in the potentia coeundi. Moreover, there were mild polyglobulism and monocytosis. The increased manganese content of the feces, which was still manifest more than eight months after the man had ceased working with manganese, indicates that the patient's organism had stored manganese. That other men who worked under the same conditions did not develop manganism does not contradict the causal significance of manganese in the reported case because an individual predisposition seems to play a part. Since nervous lesions caused by manganese frequently remain constant or gradually increase, it is somewhat surprising that considerable improvement resulted in the reported case. However, other cases have been reported in which cessation of contact with manganese, on appearance of the first symptoms, was followed by great improvement or complete cure. The author points out that this case cannot be cited as proof of the toxicity of metallic manganese, because some oxidation takes place in the course of grinding and it is possible that products of oxidation exert the toxic action.

Klinische Wochenschrift, Berlin

18: 1045-1076 (Aug. 5) 1939. Partial Index

- Elimination of Coproporphyrin in Spontaneous Urine of Human Subjects Under Influence of Irradiation. B. G. Hager.—p. 1045.
Carbon Monoxide and Hypertension. M. Staemmler and G. W. Parade.—p. 1049.
Synthesis of Hippuric Acid During Normal Pregnancy and During Puerperium. W. Neuweiler.—p. 1050.
Clinical Aspects of Addison's Disease. F. Heni.—p. 1052.
Vitamin C Content of Blood and Question of Vitamin C Deficiency. W. von Drigalski.—p. 1056.
*Disturbance in Coagulation of Blood in Jaundice Due to Obstruction and Its Treatment by Vitamin K. F. Koller and F. Wuhrmann.—p. 1058.
Substitution for Condensing Action of Gallbladder in Case of Exclusion of Gallbladder. M. Künsztler.—p. 1067.

Vitamin K and Coagulation of Blood in Jaundice.—Koller and Wuhrmann show that the hemorrhagic tendency in obstructive jaundice, which is greatly feared by surgeons, has found an explanation in recent years. The favorable therapeutic effect of vitamin K in jaundice corroborates the assumption that a K avitaminosis exists. This is not surprising when it is considered that vitamin K is fat soluble and that fat resorption is impaired in obstructive jaundice. After reviewing the clinical history of one case in which vitamin K exerted a specific effect, the authors say that they were able to demonstrate the prompt action of vitamin K on the coagulation time and on the hemorrhagic diathesis in nine cases of obstructive jaundice (five cases of cholelithiasis and four cases of carcinoma of the pancreas or choledochus). They also state that analogous observations were reported by Danish and American authors. In hepatocellular icterus, especially cirrhosis of the liver, vitamin K seems to exert no effect, which suggests that the regenerating action of vitamin K on prothrombin presupposes a more or less intact function of the hepatic cells. However, the retardation in the coagulation which is observed in nontropical sprue can be promptly counteracted by vitamin K. In this connection the authors direct attention to the fact that Fanconi ascertained in 1928 that in infantile sprue (intestinal infantilism) there occurs a form of hemorrhagic diathesis in which C avitaminosis does not appear but in which a hypothrombinemia exists. The K avitaminosis in nontropical sprue is understandable when it is considered that a disturbance in resorption is an essential factor in this disease.

Vrachebnoe Delo, Kharkov

21: 371-450 (No. 6) 1939. Partial Index

- *Symptomatology and Therapy of Brucellosis. A. A. Tarpi.—p. 375.
Treatment of Ulcer Patients with Provitamin A—Carotene. M. S. Levinson and V. M. Kushko.—p. 381.
Autohemotherapy in Ulcer Disease. O. E. Amchislavskaya.—p. 385.
Effectiveness of Linzer's Method of Treating Syphilis. D. A. Bykhovskaya.—p. 389.
Intramuscular Ichthammol Injections in Inflammation of Female Genitalia. K. P. Levitskaya.—p. 393.
Hypnosis Therapy of Pruritus Cutaneus. N. G. Bezyuk.—p. 397.

Brucellosis.—Tarpi's observations on sixty patients treated at the Tropical Institute of Stalinbad (Tadjik Republic) between 1932 and 1936 revealed that forty-six presented a gradual onset, fourteen an acute onset, and that the undulant type of fever was observed in only eighteen cases. Among the characteristic symptoms were noted persistent fever, painful sensation in the bones and joints of arthralgic rather than of arthritic type, and the appearance of painful subcuticular nodes located, as a rule, on the upper third of the arm and on the digital phalanges. These persisted for from fifteen to thirty days. Pustular, papular and roseolar rashes were observed during the various stages of the disease. In 85 per cent of the cases there were profuse sweats. The spleen was enlarged in 41 per cent, the liver in 53 per cent and there was an orchitis in 18 per cent. A mild degree of hypochromic anemia with leukopenia (from 4,000 to 5,000) and lymphocytosis was the rule. In the cases in which a positive blood culture was obtained, *Brucella melitensis* was the organism found. The author was not able to differentiate, on the basis of clinical signs, maltase fever from Bang's disease. Diagnosis is best made by the blood culture method. It takes from twelve to twenty-one days to grow the organism. The allergic brucellin test was positive in all of his cases as well as in a number of the laboratory workers who had contact with laboratory animals. The coexistence of malaria had an aggravating effect on the course of brucellosis. The average duration of the disease was six months. There were no fatalities in this series. Metenamine, calcium, acri-

flavine hydrochloride, collargol, arsphenamine and ethoxy-diamino-acridine lactate did not prove to be of much therapeutic value. Autohemotherapy was without effect, whereas citrated blood transfusions were effective in the beginning of the disease. Vaccine prepared from avirulent strains of *Brucella suis* and given intravenously in increasing doses proved to be the most effective therapy in the series.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 3981-4088 (Aug. 12) 1939. Partial Index

- Treatment of Pemphigus in Aged Persons by Means of Germanin. E. Zurhelle.—p. 3982.
Case of Diffuse Sclerosis and Its Heredity. G. P. Frets.—p. 3987.
Treatment of Schizophrenia with Insulin and Metrazol. G. W. Kastein. p. 3994.
*Considerations on Removal of Corpus Luteum Verum During Early Pregnancy and Progesterone Content of This Organ and of Mature Placenta. J. J. Duyvené de Wit and V. M. Oppers.—p. 4001.
Further Investigations on Formation and Therapy of Renal and Vesical Calculi. A. Polak.—p. 4009.
Vitamin C in Therapy. M. van Eekelen.—p. 4015.

Removal of Corpus Luteum During Early Pregnancy.
—Duyvené de Wit and Oppers report a case in which the corpus luteum of pregnancy was removed on the eighty-third day after the last menstruation. From this time until the sixth month of pregnancy progesterone was administered. Unimpaired by occasional uterine contractions, the pregnancy took a normal course. The authors further cite reports from the literature, comprising 131 cases, in which the corpus luteum was removed during the first four months of pregnancy. A review of these cases discloses that in the absence of substitutional therapy abortion results in 23.7 per cent of the cases. With regard to the treatment, the authors take the following position: In ovariectomies during pregnancy, progesterone should be given prophylactically and for some weeks after the operation. If there are no threatening symptoms and a careful supervision is possible, an expectant attitude can be taken, because in three out of four cases the pregnancy will remain intact and take a normal course without substitutional therapy. A clear understanding of the progesterone exchange can be obtained only if it is determined how much progesterone exists at a certain time in the organs preparing it, in the blood, in the organs consuming it and in the products of excretion. In the case reported by the authors, Duyvené de Wit's bitterling test was employed for the determination of the progesterone content. The corpus luteum of pregnancy which was removed from the woman weighed 1.3 Gm. and it was found to contain 33 micrograms of progesterone per gram of tissue. This is about twice as much as is found in a mature menstrual corpus luteum. The placenta, which weighed 480 Gm., contained 640 micrograms of progesterone.

Acta Radiologica, Stockholm

20: 325-414 (Aug. 21) 1939

- Method for Determination of Heart Size by Teleroentgenography (Heart Volume Index). S. Jonsell.—p. 325.
Roentgenologic Observations in Renal Tuberculosis. A. Renander.—p. 341.
*Roentgen Therapy in Nonspecific Chronic Arthritis. S. N. Bakke.—p. 357.
Pneumatosis Cystoides Ventriculi et Jejun. R. Baumann-Schenker.—p. 365.
Radiologic Treatment of Cancer of the Rectum. Elis Berven.—p. 373.
Easily Made "Safety Device" for Roentgenologic Apparatus. S. R. Kjellberg.—p. 391.
Gastroscopic and Roentgenologic Observations in Membranous Gastritis. K. Lundbæk.—p. 394.
Roentgen Diagnosis of Pneumatosis Cystoides Intestini Hominis. S. Berglund.—p. 401.
Diaphragm Construction as Contribution to Screening-Off Technique in Teleroentgen Therapy. O. Sandström.—p. 406.

Roentgen Therapy in Nonspecific Chronic Arthritis.

—Bakke rapidly reviews various theories proposed to account for the beneficial effect of roentgen rays on nonspecific chronic arthritis and reports the results that he obtained in a serial roentgenographic examination of 555 persons. He regards primary calcareous deposits in the soft tissues surrounding the joints (chiefly shoulder, knee, loins and hip) as "catch basins" for infective matter released into the blood stream by lesions elsewhere, thus conditioning inflammation and pain, and attributes the beneficial effect of roentgen rays to their action on the inflammation set up in the capsular ligaments of the joints. The author was able to verify his theory of the significance of primary lime deposits by roentgenologically testing the soft

tissues of the shoulders of 200 persons ranging in age from 20 to 69 years who had never previously complained of pain in that part of their body and by discovering that twenty-six of these (13 per cent) showed larger or smaller calcium accumulations (three bilaterally). Of these twenty-six, the age group from 20 to 29 was represented by five cases. The 555 patients with nonspecific chronic arthritis roentgenographically examined included 230 male and 325 female subjects, the age level ranging from 20 to 89, with the greatest incidence in the ages between 30 and 70. Tests made were followed up with oral or written inquiries. Subsequently 523 were reexamined and divided into four groups with the following results: no change 11.9 per cent, improved 15.3 per cent, greatly improved 34.6 per cent and cured 38.4 per cent, irradiation thus benefiting 88.3 per cent in some way. The total number of actual cures, represented by 38.4 per cent, amounted to 213 cases (age level 40 to 49, sixty-two cures; age level 50 to 59, sixty-eight). Grouped according to the chief seat of the arthritic or periarthritic ailment, there were 170 shoulder cases with 103 cures, 148 knee cases with fifty-seven cures, 103 loin cases with twenty-seven cures and eighty-three hip cases with fifteen cures. The dose, adjusted to the nonresident character of the majority of the patients, was administered daily or at most every other day, the regular dose amounting to 100 roentgens per field. Every joint received serially four or six such doses, the series varying from one to four or five and in stubborn cases to eight, at intervals of from four to eight weeks. While the knee received 100 roentgens in the course of from four to seven days, the shoulders, loins and hips received 150 six times, the hand 100 four times and so on. The author's unit skin dose was about 750 roentgens. The analysis of failures indicated that unimproved patients received on an average 1.38 treatments compared with 2.14 for the others and seems to suggest the caution not to discontinue treatments prematurely.

Ugeskrift for Læger, Copenhagen

101: 889-914 (Aug. 3) 1939

- Oxygen Therapy in Theory and Practice. C. Sonne.—p. 889.
*Avitaminosis K in Infants as Cause of Hemorrhagic Diathesis. II. Dam, E. Tage-Hansen and P. Plum.—p. 896.
Shock after Painting of Throat. O. Dige-Petersen.—p. 904.

Avitaminosis K in Infants and Hemorrhagic Diathesis.

—Dam and his associates say that in normal children an avitaminosis K, usually moderate, develops in the first days after birth and usually disappears after a week. This avitaminosis K causes a hypoprothrombinemia which must be regarded as the cause of the common slight hemorrhagic diathesis in the newborn. Whether or not jaundice is present seems to be without significance. The avitaminosis is assumed to be due to a deficient supply of vitamin K through the intestine. In some cases of icterus gravis of the newborn, anemia of the newborn and congenital dropsy, considerable hypoprothrombinemia was established. Since the administration of vitamin K in two of their cases was followed by a rapid rise in prothrombin, the authors conclude that there was an avitaminosis K in these cases. A complete lack of prothrombin established as early as twenty-four hours after birth is ascribed to reasons other than deficient resorption from the intestine.

101: 915-946 (Aug. 10) 1939

- Content of Carotenoids and Vitamin A in Mother's Milk with Special Regard to Its Dependence on Diet. T. K. With and C. Friderichsen.—p. 915.
Water and Salt Metabolism from Practical Surgical Viewpoint. V. Aalkjær.—p. 925.
Defective Nutrition in Denmark and Its Significance in Therapy. Johanne Christiansen.—p. 929.
Roentgen Examination of Appendix. V. Jensen.—p. 932.
*Investigations on Effect of Insulin on Gastric Secretion. P. Horstmann.—p. 935.
Encephalitis after Vaccination. A. Eldahl.—p. 938.
Death from Serum Sickness after Treatment with Pneumococcus Serum. P. Borch Madsen.—p. 940.

Effect of Insulin on Gastric Secretion.—Horstmann found on examination of ten schizophrenic patients that in insulin coma a considerable rise in the acidity of the gastric secretion occurs after an initial fall. The rise begins after the blood sugar has reached its low phase. The acidity decreases after oral administration of cane sugar solution or dextrose solution and also immediately after dextrose intravenously in doses which terminate the effect of insulin.

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SULFAPYRIDINE IN THE TREAT- MENT OF PNEUMONIA

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The only agent of proved value in the specific treatment of pneumonia heretofore has been antipneumococcus serum. While effective in many types of pneumococcal pneumonia, it has been costly, frequently unavailable, often tedious and occasionally impossible to give. The advent of sulfapyridine has given us another effective specific agent, and this time one that is comparatively inexpensive, more readily available and more easily administered.

During the year that has passed since Whitby¹ described experiments in which sulfapyridine afforded complete protection in mice against as high as 10,000 lethal doses of pneumococci, a large number of articles have appeared in the medical literature concerning the use of this new therapeutic agent.

On the experimental side, Fleming² has found that the drug retards the growth of pneumococci in human blood in concentrations as low as 3 mg. per hundred cubic centimeters. He³ subsequently demonstrated that the blood of patients taking sulfapyridine has a much increased antibacterial power against the pneumococcus. MacLean, Rogers and Fleming⁴ have shown that pneumococci vary in their sensitivity to the drug but that this variation is associated not with the type of pneumococcus but with the individual strain. Greey, MacLaren and Lucas⁵ have shown that sulfapyridine is superior to sulfanilamide, to a glucoside derivative of 4:4' diamino diphenyl sulfone (promin) and to hydroxyethyl-apocupreine dihydrochloride in pneumococcal infections in mice. Hilles and Schmidt⁶ have

reported that the drug is effective in experimental type XXII infections.

On the clinical side, reports have come from a variety of localities. In England, Evans and Gaisford⁷ used sulfapyridine in 100 cases of pneumonia with a mortality rate of 8 per cent. In a control series the mortality was 27 per cent. In India, Anderson and Dowdeswell⁸ in an alternated series of 100 cases observed a mortality rate of 16 per cent in the controls and 2 per cent in the treated. In South Africa, Agranat, Dreosti and Ordman,⁹ in a cooperative study embracing 550 cases of pneumonia, obtained either a marked reduction in mortality (in a general mine hospital) or a shorter period of pyrexia (in native mine hospitals). In Canada, Graham, Warner, Dauphinee and Dickson¹⁰ and Meakins and Hanson¹¹ have reported favorably on the drug.

In this country, Flippin, Lockwood, Pepper and Schwartz¹² in Philadelphia used sulfapyridine in a series of 100 cases of typed pneumococcal lobar pneumonia with a mortality rate of 4 per cent (excluding three cases under treatment twelve hours or less). A preliminary report has been published by us.¹³ Finland, Spring, Lowell and Brown¹⁴ have used sulfapyridine alone or in combination with serum in the treatment of 175 cases of pneumonia due to specific types of pneumococci, with good results. Encouraging reports concerning the use of the drug in childhood pneumonia have come from Barnett, Hartmann, Perley and Ruhoff¹⁵ in St. Louis, from Wilson and his associates¹⁶ in Cincinnati and from MacColl¹⁷ in Durham, N. C.

A summary of the replies to a questionnaire¹⁸ sent out by THE JOURNAL to approximately 100 physicians

The sulfapyridine and serum were supplied by the Lederle Laboratories, Inc.

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From the New York Hospital, the Second (Cornell) Medical Division and the Department of Pathology of Bellevue Hospital and the Department of Medicine, College.

1. Whitby, L. pneumococcal and Other Infections, with Pyridine, Lancet 1: 1210 (May 28) 1938.

2. Fleming, A. The Antibacterial Action in Vitro of 2-(p-Aminobenzenesulfonamido) Pyridine on Pneumococci and Streptococci, Lancet 1: 564 (Sept. 3) 1938.

3. MacLean, I. H.; Rogers, K. B., and Fleming, Alexander: M. & B. 693 and Pneumococci, Lancet 1: 562 (March 11) 1939.

4. Greey, P. H.; MacLaren, D. B., and Lucas, C. C.: Comparative Chemotherapy in Experimental Pneumococcal Infections, Canad. M. A. J. 40: 319 (April) 1939.

5. Hilles, Carolyn, and Schmidt, L. H.: Sulfanilamidopyridine [2-(p-Aminobenzenesulfonamido) pyridine] in Experimental Infections with Type XXII Pneumococcus, Proc. Soc. Exper. Biol. & Med. 40: 73 (Jan.) 1939.

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8. Anderson, T. F., and Dowdeswell, R. M.: Treatment of Pneumonia with M. & B. 693, Lancet 1: 252 (Feb. 4) 1939.

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10. Graham, Duncan; Warner, W. P.; Dauphinee, J. A., and Dickson, R. C.: The Treatment of Pneumococcal Pneumonia with Dagenan (M. & B. 693), Canad. M. A. J. 40: 325 (April) 1939.

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13. Plummer, Norman, and Ensworth, Herbert: Preliminary Report of the Use of Sulfapyridine in the Treatment of Pneumonia, Bull. New York Acad. Med., 2d series 15: 241 (April) 1939.

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17. MacColl, W. A.: Clinical Experience with Sulfapyridine, J. Pediat. 14: 277 (March) 1939.

18. Sulfapyridine: Special Report of the Council on Pharmacy and Chemistry, J. A. M. A. 112: 1830 (May 6) 1939.

working with sulfapyridine embodies experience with the drug in about 1,800 cases of pneumonia in adults and 650 in children. It is here stated: "While there is much to be learned about the exact place of sulfapyridine in the treatment of pneumonia, it appears to be a very useful measure in many cases when properly employed." Caution in its use is advised until more evidence of its usefulness and safety is available, and the necessity for continuation of typing is emphasized. Sulfapyridine has been accepted for inclusion in New and Nonofficial Remedies.¹⁹

Pharmacologic and toxic aspects have been covered by Wien,²⁰ Long,²¹ Marshall, Bratton and Litchfield,²² Johnston,²³ Stokinger,²⁴ Long, Bliss and Feinstone,²⁵ Cooper Gross and Lewis,²⁶ Schmidt and Hughes,²⁷ Hoyt and Levine,²⁸ Bryce and Climenko²⁹ and Sutherland.³⁰

That pneumococci can rapidly acquire tolerance or fastness to sulfapyridine has been demonstrated in laboratory animals³¹ and in man.³²

MATERIAL AND PROCEDURE

The present report deals with our experience and that of our associates with sulfapyridine at the New York Hospital and at Bellevue Hospital.³³ We have administered sulfapyridine to 270 patients suffering from pneumococcal pneumonia, either typical (lobar) or atypical.

As soon as the clinical diagnosis of pneumonia is made, sputum and blood are obtained for bacteriologic study and a blood count is taken; sulfapyridine therapy is then started immediately. In nearly every case one or more x-ray films of the chest are taken. Frequent urinalyses are done and blood counts are repeated.

Our routine order for sulfapyridine is for 2 Gm. as an initial dose, followed by 1 Gm. every four hours until 16 Gm. has been given. At this point it is decided whether the drug should be stopped or continued. Most of the patients need no more. Complicated cases, cases in which the response is inadequate and, in particular, the bacteremic cases are continued on the drug, usually at the 6 Gm. a day rate. A few patients have been given 0.5 Gm. every two hours. Occasionally, after the first course, the dose is increased to 1.5 or 2 Gm. or reduced to 0.5 Gm. every four hours. In some cases consider-

able help may be obtained from the level of free drug in the blood. For that determination we have used both the Marshall method³⁴ and that of Werner;³⁵ the latter has a short modification sufficiently accurate for clinical work. Rectal administration of the drug has been tried, but absorption is either quite small or lacking altogether.

RESPONSE

In a large majority of instances a marked fall in temperature and in pulse rate occurred within twenty-four hours, and many times this had already begun by the time the second dose of sulfapyridine had been given. Associated *pari passu* with these changes were

TABLE 1.—Distribution of Cases and Mortality Rate by Types

Type	Total Cases	Deaths	Mortality Rate
I.....	32	2	6.3%
II.....	11	1	
III.....	44	5	11.4%
IV.....	10	4	
V.....	23	2	8.7%
VI.....	5	0	
VII.....	20	2	10.0%
VIII.....	23	1	4.3%
IX.....	1	0	
X.....	3	1	
XI.....	2	0	
XII.....	2	0	
XIII.....	2	1	
XIV.....	7	3	
XV.....	2	0	
XVI.....	2	0	
XVII.....	3	1	
XVIII.....	6	0	
XIX.....	3	0	
XX.....	3	0	
XXI.....	1	0	
XXII.....	3	1	
XXIII.....	3	1	
XXIV.....	3	1	
XXV.....	5	0	
XXVIII.....	1	0	
XXIX.....	1	1	
Unclassified.....	35	6	16.6%
Mixed.....	16	2	
Totals.....	270*	34†	12.6%

* Serum was used in addition in 102 of the cases, as follows: type I, 26; II, 9; III, 17; IV, 4; V, 10; VI, 1; VII, 10; VIII, 15; X, 1; XI, 1; XII, 1; XIV, 2; XVII, 1; XVIII, 1; XXIV, 1; XXV, 1; XXVIII, 1.
† Eleven of these were fatal within twenty-four hours of onset of therapy. Corrected mortality, 8.5 per cent.

a decrease in toxemia and a subjective improvement. Bacteremia—in some cases what appeared to be an overwhelming bacteremia—was usually promptly controlled, although the patients with bacteremia tended to have a moderate degree of fever for a week or more after the original fall in temperature. Not every bacteremic patient whose blood was sterilized recovered, however. The physical signs seem to go through the usual cycle.

The marked frequency with which the temperature falls in pneumococcal infections when sulfapyridine is given, together with the fact that in other infections in which we have used the drug such a fall is much less frequent or does not occur at all (e. g. staphylococcal empyema, non-pneumococcal pneumonia), leads us to believe that the temperature response is not merely an antipyretic effect.

We have been interested in finding out whether the use of sulfapyridine would interfere with the capsule of the pneumococcus and consequently with typing. Whitby² observed that when mice are injected intraperitoneally with pneumococci and then treated with sulfapyridine the capsule shows degenerative changes. Telling and Oliver,³⁶ reporting one case, and Law-

34. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: The Determination of Sulfanilamide, *Science* 88: 85 (July 22) 1938.

35. Werner, E. A.: Estimation of Sulfanilamide in Biological Fluids, *Lancet* 1: 18 (Jan. 7) 1939.

36. Telling, M., and Oliver, W. A.: Case of Massive Pneumonia, Type III, with Massive Collapse, Treated with 2-(p-Aminobenzenesulfonamido) Pyridine, *Lancet* 1: 1391 (June 18) 1938.

19. New and Nonofficial Remedies, Report of Council on Pharmacy and Chemistry, J. A. M. A. 112: 1831 (May 6) 1939.

20. J. A. M. A. 112: 217 (April-June) 1938.

21. Long, P. H.: Sulfapyridine: Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. 112: 538 (Feb. 11) 1939.

22. Marshall, E. K., Jr., Bratton, A. C., and Litchfield, J. T., Jr.: Toxicity and Absorption of Sulfapyridine and Its Soluble Sodium Salt, *Science* 88:

23. Johnston, F. D.: Treatment with M. & B. 693, *Lancet* 2: 120 (Jan. 2) 1939.

24. Stokinger, H. E.: The Absorption, Acetylation and Excretion of Sulfapyridine, *Bull. New York Acad. Med.*, 2d series 15: 252 (April) 1939; *Proc. Soc. Exper. Biol. & Med.* 40: 61 (Jan.) 1939.

25. Long, P. H., and Feinstone, W. H.: Observations on the Absorption and Excretion of Sulfapyridine, *Proc. Soc. Exper. Biol. & Med.* 39: 486 (Dec.) 1938. Long, P. H.; Bliss, Eleanor A., and Feinstone, W. H.: The Effects of Sulfapyridine, Sulfanilamide and Related Compounds in Bacterial Infections, *Pennsylvania M. J.* 42: 483 (Dec.) 1938.

26. Cooper, T. B., Gross, Paul, and Lewis, Marion: Chemotherapeutic Evaluation of Sulfanilamide and 2-(Sulfanilamido) Pyridine in Type II Pneumococcal Infections in Mice and Rats, *Proc. Soc. Exper. Biol. & Med.* 40: 37 (Jan.) 1939.

27. Schmidt, L. H., and Hughes, H. B.: Absorption and Excretion of Sulfanilamidopyridine (2-Para-Aminobenzenesulfonamido Pyridine), *Proc. Soc. Exper. Biol. & Med.* 40: 409 (March) 1939.

28. Hoyt, R. E., and Levine, Milton: In Vitro Studies on the Action of Sulfapyridine, *Proc. Soc. Exper. Biol. & Med.* 40: 465 (March) 1939.

29. Bryce, D. A., and Climenko, D. R.: Sulfapyridine in Pneumonia, *J. A. M. A.* 112: 1182 (March 25) 1939.

30. Sutherland, M. E.: Following Administration of M. & B. 693, *Lancet* 1: 12 (Jan. 2) 1939.

31. Ross, R. W.: Acquired Tolerance to M. & B. 693, *Lancet* 1: 1207 (May 27) 1939.

32. May, Kenneth: A Fatal Case of Pneumococcal Meningitis, Treated with M. & B. 693, *Lancet* 1: 1100 (May 13) 1939.

33. Cases observed on the First Medical Division at Bellevue Hospital are included through the courtesy of Drs. I. Ogden Woodruff and James Liebmann; on the Fourth Medical Division through the courtesy of Drs. Charles Nammack, Mennasch Kalkstein and Saul Solomon.

rence,³⁷ reporting two cases, observed that the capsules of pneumococci recovered from the sputum of patients being treated with sulfapyridine failed to react with the type-specific serum with which they had originally reacted. We have not been able to confirm this finding. Repeat typings are done on our patients when the original typing has not shown a fixed type (I, II, V and VII). In a series of seventy-five such retypings, capsular swelling occurred whenever pneumococci were present, even after as much as 40 Gm. of drug had been given. Furthermore, there has been no interference with the capsules of pneumococci recovered from the blood, spinal fluid or pleural exudate after as much as 200 Gm. of sulfapyridine. There was one exception to this: poor capsular swelling in organisms recovered from the blood of a patient with bacteremia and endocarditis was observed after 140 Gm. of sulfapyridine had been given, but subsequent blood cultures typed easily, even though the drug was continued.

In a more recent article, McIntosh and Whitby³⁸ state that they have seen capsular degeneration only in peritoneal samples and believe that the nonencapsulated coccus found by Telling and Oliver was probably present simultaneously with the original type III coccus observed but persisted in the sputum after the other had disappeared. In this connection it should be kept in mind that the bacterial flora in the sputum often changes during the course of pneumonia whether any specific treatment is given or not.

EFFECT ON THE MORTALITY RATE

Of the 270 patients with pneumococcal pneumonia in our series, thirty-four (12.6 per cent) died. If eleven cases in which death occurred within twenty-four hours of the beginning of treatment are excluded, the rate becomes 8.5 per cent. The distribution by types is shown in table 1.

It is interesting that the mortality rate at Bellevue Hospital was 15.3 per cent (10.3 per cent if twenty-

the twenty-four hour group are excluded the mortality rate becomes 25.8 per cent. The distribution is shown in table 2.

In any evaluation of our statistics it must be borne in mind that, of the 270 patients with pneumococcal pneumonia treated with sulfapyridine, 102 were given

TABLE 3.—Toxic Reactions: Based on 323 Patients Treated with Sulfapyridine

	Cases
1. Gastrointestinal	
Nausea.....	165 (52%)
Vomiting.....	129 (40%)
Severe vomiting.....	35 (11%)
2. Skin	
Generalized morbilliform rash.....	5
Questionable, atypical, rash.....	2
3. Blood	
Anemia.....	2
Granulocytopenia.....	0
4. Liver	
Jaundice (preceded therapy).....	1
5. Kidney	
Ureteral stone.....	2
Hematuria without proved stone:	
Gross.....	2
Microscopic.....	2
Nitrogen retention.....	3

serum also. The patients in this series were not alternated between drug alone and drug and serum; we now have available serum for all types, and the problem of the value of serum in conjunction with sulfapyridine is now being studied at Bellevue Hospital in a cooperative program of the First, Second and Fourth medical divisions and involves strict alternation of cases. In the present series, generally speaking, serum was used for the more seriously ill patients. For example, of the thirty-five patients with bacteremia twenty-two received serum as well as sulfapyridine. It is therefore not possible to give an exact mortality rate on the basis of the present series either for sulfapyridine alone or for sulfapyridine plus serum.

However, the clinical recovery of a number of the patients seemed more rapid and certain when serum was used. At least from a theoretical point of view it would be rational to expect a surer response when the effect of the specific antibodies contained in serum is added to that of sulfapyridine, which apparently acts directly on the bacteria, probably by neutralization of some metabolic function or enzymatic activity,³⁹ and is not concerned with the immunity mechanism. It may be that the use of serum in conjunction with sulfapyridine will further reduce the low mortality rate, which, it appears, can be obtained with sulfapyridine alone. It will take some time to determine this, and until the question is determined we believe that the use of serum should not be abandoned.

BLOOD SULFAPYRIDINE LEVELS

There is a marked individual variation in absorption and acetylation of sulfapyridine. With our routine dosage we obtained blood levels of free drug ranging from traces to 25 mg. per hundred cubic centimeters.

Six patients had blood determinations made at hourly or two hourly intervals after the onset of therapy. Sulfapyridine was detected in the blood within an hour, rose steadily for about twelve hours and then began to level off. Subsequently the level in a given case usually remained fairly uniform as long as the same dosage was maintained. Increasing the dosage after this level increases the blood level, but not in proportion to the extra amount of drug given.

TABLE 2.—Distribution of Bacteremic Cases by Types

Type	Cases	Deaths
I.....	6	2
II.....	2	1
III.....	6	2
IV.....	3	2
V.....	3	1
VII.....	4	1
VIII.....	4	0
X.....	1	1
XII.....	1	0
XIV.....	2	1
XX.....	1	0
XXIII.....	1	1
XXV.....	1	0
Totals.....	35*	12 (34.3%)†

* Serum was used in twenty-two of the cases: type I, 6; II, 2; III, 2; IV, 2; V, 3; VII, 3; VIII, 3; XIV, 1.

† Four of these were fatal within twenty-four hours of onset of therapy. Corrected mortality, 25.8 per cent.

four hour cases are omitted) and in the New York Hospital group, composed of seventy-six patients from a higher economic level, 5.4 per cent. The incidence of accompanying systemic disease and alcoholism was high at Bellevue Hospital and late admission was frequent.

Thirty-five patients with bacteremia were encountered; twelve died (34.3 per cent). If four cases in

37. Lawrence, E. A.: Type III Pneumococcus Pneumonia: Effect of 2-(p-Aminobenzenesulfonamido) Pyridine in Treatment, New York State J. Med. 39: 22 (Jan. 1) 1939.

38. McIntosh, James, and Whitby, L. E. H.: The Mode of Action of Drugs of the Sulfonamide Group, Lancet 1: 431 (Feb. 25) 1939.

39. Whitby, L. E. H.: Chemotherapy of Bacterial Infections, Lancet 2: 1095 (Nov. 12) 1938. McIntosh and Whitby.³⁸

At what time after administration of a dose of sulfapyridine should blood be taken for determination of the blood level? In an effort to answer this we made hourly determinations in five cases and found that, once the initial period of rise mentioned is over, there is no significant variation in blood level between one dose and the next. Consequently we feel that blood may be taken at any convenient time.

Marshall and Long⁴⁰ have recently advocated the use of sodium sulfapyridine by vein when absorption of sulfapyridine from the gastrointestinal tract is poor, when prompt action of the drug is imperative or when patients are vomiting. Blake and Haviland⁴¹ have dis-

several cases in which there was no prompt response, increasing the dose had no appreciable effect on the clinical course. The cases in which this was tried, however, were complicated cases; two were severely bacteremic and one was a case of empyema.

TOXIC REACTIONS

The phase of the problem concerned with toxic reactions is of great importance, and careful attention has been given to it. Our data in this regard are based on the 270 cases of pneumococcal pneumonia and in addition fifteen cases of pneumonia in which we could isolate no pneumococci, five cases of subacute bacterial endo-

TABLE 4.—Summary of the Fatal Cases

Name	Age	Type	Drug, Gm.	Serum, Units	Comment	Name	Age	Type	Drug, Gm.	Serum, Units	Comment
1. J. K.	65	Unclassified	16	0	Sick several weeks at home and two weeks in hospital; autopsy: bilateral patchy pneumonia	17. J. K.	65	V	2	200,000	24 hr. case: could swallow only 1 dose; arteriosclerotic heart disease with fibrillation and decompensation
2. T. D.	55	III	6	0	12 hr. case: admitted with bacteremia on 9th day	18. J. P.	82	III	7	130,000	24 hr. case: arteriosclerotic heart disease with fibrillation; autopsy: pneumonia and calcified aortic stenosis
3. M. U.	55	IV	17	0	Consolidation of right lower lobe by x-ray; improving until sudden expectoration of large amounts of foul pus; probably abscess; no autopsy	19. J. S.	37	V	5	240,000	24 hr. case: admitted 7th day with bacteremia; had been on drinking bout
4. J. H.	71	IV	33	310,000	Arteriosclerotic heart disease with fibrillation and decompensation; admitted with bacteremia on 8th day	20. T. P.	44	VII	36	400,000	2 wks. severe alcoholism before admission about 10th day with bacteremia; blood sterilized in 24 hours
5. E. R.	67	Unclassified	32	0	Emaciated Negroess with history of weight loss, weakness, abdominal pain for 1 year; onset indefinite; no autopsy	21. M. C.	70	XIV	5	0	15 hr. case: emphysema and chronic bronchitis with terminal pneumonia; parkinsonism
6. J. S.	60	III	3	0	12 hr. case: admitted late, probably during 2d week	22. A. M.	56	XIV	2	40,000	8 hr. case: auricular fibrillation; cardiac decompensation
7. P. C.	77	IV	2	0	6 hr. case: arteriosclerotic heart disease; onset indefinite	23. T. C.	51	XVII	25	190,000	Admitted in diabetic acidosis; temporary response to drug therapy
8. L. D.	60	I	6	230,000	Admitted 8th day; responded temporarily; then relapsed	24. J. V.	38	Unclassified	7	0	Admitted 4th day; vomited; refused medication after 1st day
9. H. B.	71	VIII	11	0	Semilematose on admission; in bed 4 wks. previously, with practically nothing to eat	25. L. C.	62	Unclassified	17	0	Semilematose on admission; blood pressure 100/140; drug given by Levine tube
10. G. T.	56	IV	15	414,000	Bacteremic patient who failed to respond	26. A. M.	56	XXIX	15	0	Blood pressure 200/130; uremia and pneumonia
11. H. S.	10	Unclassified	11	0	Admitted for cardiac decompensation and asites; had respiratory infection which eventuated into pneumonia	27. C. S.	66	XXIV	18	0	Admitted in cardiac failure; temporary response to drug, then became uremic
12. C. W.	54	VII	235	300,000	Persistent bacteremia; pneumococcal endocarditis and meningitis	28. G. J.	40	II	2	275,000	8 hr. case: bacteremic patient admitted in extremis on 12th day
13. M. H.	75	Unclassified	5	0	Responded to drug; delirium caused transfer to psychiatric ward where sulfapyridine was not given; spread of pneumonia and death	29. E. W.	67	III	4	300,000	12 hr. case: blood pressure 210/80; known arteriosclerotic heart disease for 5 years
14. C. W.	45	III	17	350,000	Admitted 4th day with bacteremia, 100 colonies per cc.	30. R. M.	63	XIV	16	550,000	Admitted with uremia and bacteremia
15. A. G.	37	I	4	240,000	12 hr. case: admitted on 8th day with bacteremia	31. J. M.	63	IX and XVIII	10	0	Arteriosclerotic heart disease; sudden death after temperature normal several days
16. J. M.	81	XXIII, XXIV	15	0	Bacteremia type XXIII; did fairly well until drug was stopped through error	32. M. H.	69	VIII and streptococcus	75	0	Arteriosclerotic heart disease; probable cardiac death
						33. E. N.	17	VIII	50	100,000	Acute rheumatic fever with pneumonia
						34. R. M.	12	X	10	0	Acute rheumatic fever with pneumonia and bacteremia; died 40 hr. after admission

solved 2 Gm. of sulfapyridine in 1 liter of 5 per cent dextrose in saline solution by heating the solution nearly to boiling; this preparation may then be given intravenously or by hypodermoclysis.

CORRELATION OF BLOOD LEVEL WITH CLINICAL RESPONSES

Flippin and his associates found that good clinical responses occurred in cases in which the blood level was only from 1 to 2.8 mg. per hundred cubic centimeters and that there was no apparent correlation between the blood level and the rapidity of recovery. We likewise are unable to state what an "adequate" blood level might be. Some of the best responses that we have had occurred in the "lowest level" group. In

carditis and thirty-one miscellaneous cases. The incidence of the various reactions is given in table 3.

Nausea and vomiting is almost certainly central in origin. It rarely occurs until from 4 to 6 Gm. of sulfapyridine has been given, and it has been shown⁴⁰ that giving sodium sulfapyridine by vein causes vomiting. We have found no satisfactory way to control it short of allowing the blood level to fall. Here again, however, individuals vary greatly; some vomit when the blood level is only 2 or 3 mg. per hundred cubic centimeters and others do not vomit when the blood level reaches 8 or 9 mg. Usually the drug could be continued in spite of vomiting, which frequently lessens as recovery takes place.

Four of the five patients with morbilliform rash had received between 30 and 40 Gm. of drug; the other, 16 Gm. The rash cleared promptly when the sulfapyridine was stopped.

40. Marshall, E. K., Jr., and Long, P. H.: Sodium Sulfapyridine. *J. A. M. A.* 112: 1671 (April 29) 1939.

41. Blake, F. G., and Haviland, J. W. Sulfapyridine in Pneumococcal, Streptococcal and Staphylococcal Infections, read before Association of American Physicians May 2, 1939 (to be published).

PNEUMONIA—PLUMMER AND ENSWORTH

1851

A number of patients had minor falls in red blood cell counts and hemoglobin values, such as might be encountered in severe infections. Only two, however, were severe enough to cause concern; in both the hemoglobin content fell below 50 per cent. Recovery followed withdrawal of the drug.

Liver damage attributable to sulfapyridine has not been encountered clinically or at autopsy. In our experience, toxic effects involving the kidney and ureter have been the most disturbing. In two cases, definite ureteral stones composed of sulfapyridine have been found. The first of these two patients was a woman of 40 with subacute bacterial endocarditis who received 540 Gm. of sulfapyridine over the course of three months. The blood levels ranged from 4 to 8 mg. per hundred cubic centimeters, and subjective and objective improvement occurred, but eventually she died. Microscopic hematuria was noted a few days before death. At autopsy two small white stones were found in the pelvis of one kidney which on analysis showed almost pure acetylated sulfapyridine. X-ray films were taken but they were found not to be radiopaque. There were healed kidney infarcts, but Dr.

festations and who recovered, and also in a man aged 54 with pneumococcal endocarditis after 200 Gm. of the drug had been given. With others, we believe that the explanation of hematuria as a toxic reaction is precipitation of the quite insoluble acetylsulfapyridine in the kidney tubules and pelvis and consequent mechanical damage. In the last case cited, however, it is uncertain

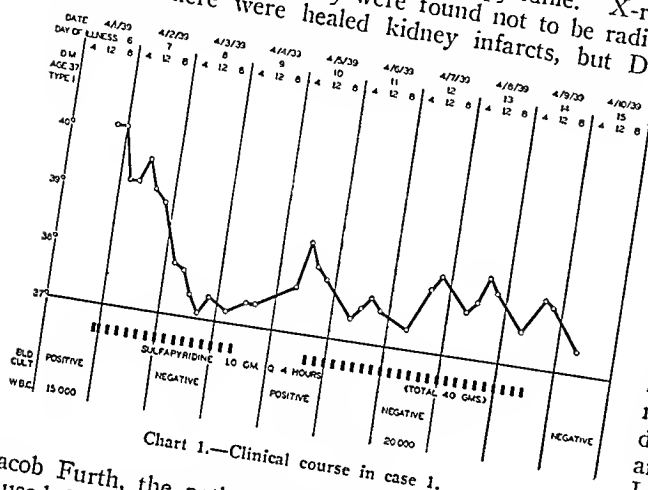


Chart 1.—Clinical course in case 1.

Jacob Furth, the pathologist, believes that the stones caused the hematuria in this case.

In the second case, one of type III pneumonia, gross hematuria and pain in the flanks radiating down the ureters occurred after only 13 Gm. of sulfapyridine had been given. Urographic study revealed negative shadows in the kidney pelves interpreted as stones, and cystoscopy was done. Gravel was found in the bladder and ureters; on analysis this proved to be composed of acetylated sulfapyridine.

Two other patients in our series had gross hematuria. One was a seven months pregnant woman with type III pneumonia who had severe bilateral ureteral colic and hematuria after 15 Gm. of sulfapyridine had been given. Urographic study was done. One kidney pelvis was dilated, but the head of the fetus overlay this abnormality, obscuring the plates and interfering with their interpretation. No stone was passed but recovery was prompt. The other patient was a man aged 55 with the grip. After the administration of only 5 Gm. of sulfapyridine, temporary anuria occurred, followed by gross hematuria and a rise in urea nitrogen to 37 mg. per hundred cubic centimeters. He recovered when the drug was stopped, and again no stones were passed.

Microscopic hematuria was noted after administration of 16 Gm. of the drug in a man aged 68 with type III pneumonia who had no other renal symptoms or mani-

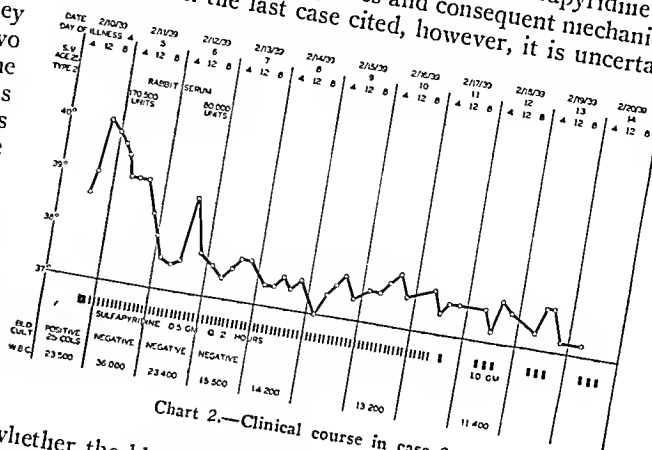


Chart 2.—Clinical course in case 2.

whether the blood came from kidney infarcts or as the result of endocarditis or was due to sulfapyridine itself. At autopsy, no stones were found but infarction was present.

In three additional cases, temporary elevation of the blood urea nitrogen was observed without other signs of kidney damage. Sulfapyridine was discontinued and prompt recovery ensued.

Besides these cases in the present series, we have first hand knowledge of the occurrence of gross hematuria—in two instances in children—in five patients not under our care. Kidney stones have been produced with sulfapyridine experimentally by Antopol and Robinson⁴² and by Gross, Cooper and Lewis.⁴³ Lawrence⁴⁴ has reported a human case of hematuria

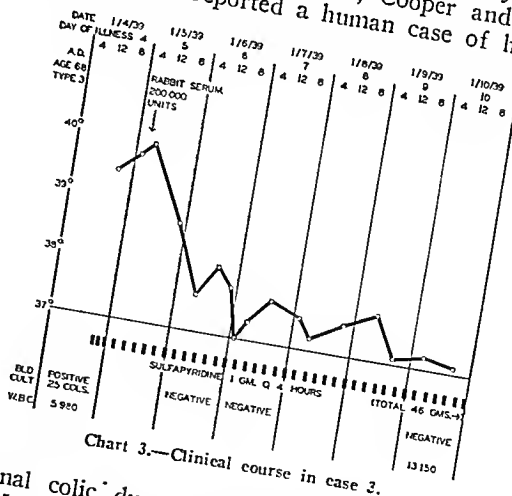


Chart 3.—Clinical course in case 3.

and renal colic due to stone, and Southworth and Cooke⁴⁵ reported three cases of hematuria, one with visible blood, in persons under treatment with sulfapyridine.

42. Antopol, William, and Robinson, H.: Urolithiasis and Renal Pathology After Oral Administration of Sulfanilamidopyridine (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* 40: 428 (March) 1939.
43. Gross, Paul; Cooper, F. B., and Lewis, Marion: Urinary Calculations Caused by Sulfapyridine, *Proc. Soc. Exper. Biol. & Med.* 40: 448 (March) 1939.
44. Lawrence, E. A.: Recent Advances in Treatment of Pneumonia, *Internat. Rev. Recent Advances in Med.* 3: 48 (Jan.) 1939.
45. Southworth, H., and Cooke, Crispin: Nitrogen Retention Associated with Sulfapyridine, *J. A. M. A.* 112: 1820 (May 6) 1939.

COMPLICATIONS

1. *Empyema*.—This was encountered thirteen times. In all but two cases, signs suggestive of fluid were present before therapy was begun.

2. *Otitis Media and Mastoiditis*.—One patient was admitted with this condition complicating a type VIII pneumonia.

3. *Pleural Effusion*.—Six sterile nonpurulent effusions occurred. All the patients recovered on repeated thoracentesis.

4. *Endocarditis and Meningitis*.—These conditions occurred once each, in the same case. It is interesting that in this case signs of meningitis and a positive spinal

TABLE 5.—Distribution of Cases by Age

Years	Cases	Deaths
12-19.....	16	2
20-29.....	36	0
30-39.....	50	3
40-49.....	60	3
50-59.....	50	7
60-69.....	37	11
70-79.....	19	6
80-89.....	2	2

fluid culture for type VII occurred three weeks after admission, but both subsequently cleared up on continued drug therapy. Recurrence was noted, however, when the patient was in a terminal state nearly three weeks later.

COMMENT ON THE FATAL CASES

The fatal cases are summarized in table 4. Eleven of the thirty-four patients died within twenty-four hours of the onset of therapy. Of the remaining, eight had serious organic disease affecting the cardiovascular system, two had been on drinking bouts, one was in severe diabetic acidosis on admission and one was uremic on admission. In two other cases the drug was prematurely stopped through error, and this seemed to play a part in the eventual outcome.

As table 4 suggests, no selection of cases was made, and sulfapyridine was not withheld because of the apparent terminal condition in any case.

SUMMARY AND CONCLUSIONS

1. An analysis of 270 cases of pneumococcal pneumonia reveals that treatment with sulfapyridine resulted in a shortened period of pyrexia, a sterilization of the blood stream and a low mortality rate.

2. Blood determinations for sulfapyridine show an irregular but prompt absorption and fail to show a correlation between the blood level and the clinical response.

3. The incidence of serious toxic reactions is low. Nausea and vomiting are frequent.

4. Whether serum should be administered also, particularly to seriously ill patients, is still *sub judice*.

5. Examination and typing of any available bacteriologic specimens—sputum, blood, spinal or pleural fluid—should not be abandoned. It gives information of value in diagnosis, in prognosis and in possible further specific therapy.

REPORT OF CASES

CASE 1 (chart 1).—D. M., a woman aged 37, was admitted to Bellevue Hospital on the sixth day of acute illness. Physical and x-ray examinations showed consolidation of the right lower

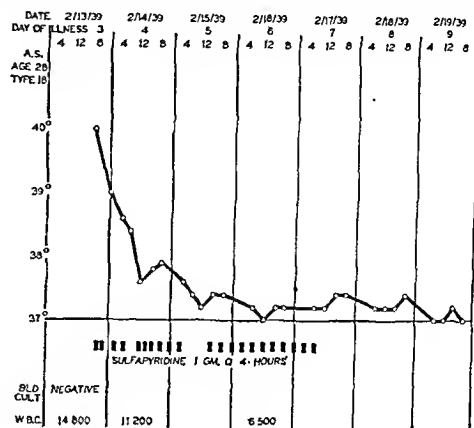


Chart 5.—Clinical course in case 5.

lobe. Type I pneumococci were recovered from the sputum and from the blood. On sulfapyridine she improved, and the blood became sterile. Through error, sulfapyridine was stopped after 16 Gm. had been given, whereupon the temperature rose and the blood culture again became positive. When administration of the drug was resumed the blood again became sterile and the patient recovered, although a low grade fever persisted for nearly three weeks.

CASE 2 (chart 2).—S. V., a woman aged 26, was admitted to the New York Hospital on the fourth day of acute illness. She gave a past history of rheumatic fever and rheumatic heart disease. On admission the sputum showed type II organisms and the blood culture showed 25 type II pneumococci per cubic centimeter. The physical and x-ray examinations revealed pneumonia involving the right middle lobe, the right lower lobe and the left lower lobe. Sulfapyridine was started shortly after admission to the hospital. On the second and third days after admission, which were the fifth and sixth days of illness, a total of 458,500 units of type II rabbit serum was administered. The toxemia subsided promptly. Blood cultures were taken daily for the first four days and were sterile. After treatment was commenced the patient made a rapid recovery. There was no nausea or vomiting and no other reaction to either the sulfapyridine or the serum.

CASE 3 (chart 3).—A. D., a woman aged 68, was admitted to Bellevue Hospital on the fourth day of a very acute illness. On admission the sputum showed type III pneumococci and the blood contained 25 type III organisms per cubic centimeter. The leukocyte count was only 5,980. Sulfapyridine was started as soon as the clinical diagnosis of pneumonia was made. Early on the second day 200,000 units of rabbit serum was injected intravenously. The toxemia was quickly controlled. Later blood cultures were sterile. The white blood cell count rose from 5,980 to 13,150 during the period in which sulfapyridine was given. Because of the grave prognosis in such a case, the drug was continued until 46 Gm. had been given. There was no gastric irritation and no other untoward reaction.

CASE 4 (chart 4).—H. C., a Negro aged 32, was admitted to Bellevue Hospital on the fourth day of his disease. The sputum showed type V organisms. Blood culture was sterile. Physical and x-ray examination revealed consolidation of the lower part of the right upper lobe. He received 16 Gm. of sulfapyridine; recovery was prompt and uneventful.

CASE 5 (chart 5).—A. S., a woman aged 28, was admitted to the New York Hospital on the third day of illness with pneumonia involving the entire left lower lobe. On admission the

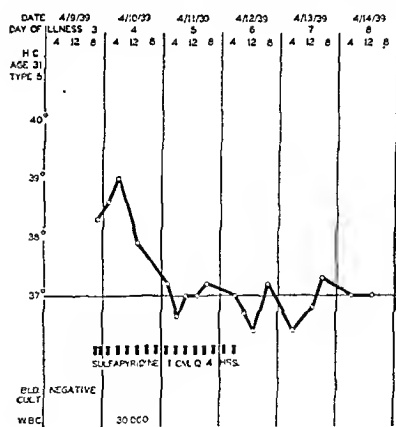


Chart 4.—Clinical course in case 4.

sputum showed type XVIII pneumococci. The blood culture was sterile and the white blood cell count was 14,800. Sulfapyridine was started the day of admission and was continued for three and one-half days until 20 Gm. had been administered. There was a quick response to the drug and no reactions occurred.

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ABSTRACT OF DISCUSSION

DR. RUSSELL L. CECIL, New York: In these reports on chemotherapy in pneumonia one notices the strikingly low death rate. The standard death rate from pneumonia at Bellevue Hospital runs from 35 to 40 per cent. In serum treated cases this was cut about half in two. With sulfapyridine, the death rate was reduced to 12 per cent. If the cases in which death occurs within twenty-four hours are eliminated, it is 8 per cent. In a series of seventy-five odd cases that Dr. Lawrence and I have seen in private practice, the death rate runs about 5 or 6 per cent with sulfapyridine. This is a better figure than we have ever been able to obtain with serum alone. The fact remains though that when serum is used under ideal conditions, such as those obtaining at the Rockefeller Institute, at Harlem and in certain other places, the figures are almost as good as with sulfapyridine therapy, if we make an exception of type III, in which serum has not been so striking as sulfapyridine. One of the most interesting features of this paper is the remarkable effect of sulfapyridine therapy on type III pneumonia. The death rate in our work in New York has usually run around 40 to 50 per cent, some winters even higher. In Plummer and Ensworth's series the death rate in the type III cases was only 11 per cent. In thirty-eight cases of type III pneumonia which we have treated this winter in private practice, in which we had expected a death rate ordinarily of 50 or 50-odd per cent, the death rate was only 10 per cent. Pneumonia has been milder this winter than usual, but that is because the distribution of types has been different. The good old type III pneumonia is just as severe as it has ever been. The same is true of type II pneumonia. We have had a particularly high incidence of type III and a low incidence of types I and II. Take any group of type III pneumonias this winter or any other winter and they run true to form. We have a double-barreled gun for the treatment of pneumonia, and whether we need both barrels or only one remains to be seen. Dr. Bullowa and Dr. MacLeod expressed it very well when they said that serum fortifies the pneumonia patient; sulfapyridine injures the pneumococcus. For the present we must keep our serum handy and use it in severe cases along with sulfapyridine, and we must continue to type our pneumonias in order that we may get all the better oriented with regard to this new form of therapy.

DR. H. F. FLIPPIN, Philadelphia: There is less variation from year to year in the virulence of the pneumococcus in the lower types, particularly type I infections. Since last fall my associates and I have treated over 500 adult pneumonia patients with sulfapyridine. Of this number 101 represent type I. Twenty-one of these had positive blood cultures with a mortality rate of 14.3 per cent. The mortality rate for the entire type I series was 5.8 per cent. During this same time eighty-eight patients of type I were treated with various forms of therapy at the Philadelphia General Hospital. In those receiving nonspecific, serum and sulfapyridine treatments the mortality rates were 44.4 per cent, 11.5 per cent and 3.7 per cent respectively. We have found it advisable to give rather large total doses to those with blood stream infections. In such cases a total of 25 Gm. and usually more has proved necessary, as it is important to continue the drug despite a normal temperature. Some significance can be placed on the white blood count following the administration of sulfapyridine. In most instances the critical drop in temperature is closely followed by a marked reduction in the total white blood count, but if it remains elevated it is wise to look for a spread in the infection or for complications. Our experiences correspond to those of Drs. Plummer and Ensworth concerning the toxic manifestations of sulfapyridine. The gastrointestinal symptoms of nausea and vomiting have proved the most troublesome.

To combat these we have used with varying success such adjuvants as intravenous chlorides, chloral hydrate, barbiturates and, more recently, nicotinic acid. Microscopic hematuria has been detected in approximately 5 per cent and gross hematuria in 1 per cent of our patients. Careful pathologic studies in the fatal cases have failed to show any evidence of renal damage attributable to the drug. This question of possible renal involvement is one that remains to be properly evaluated. We have not had enough occasions to use both serum and sulfapyridine in the same case to express an opinion as to the merits of combined therapy. At this time we feel that sulfapyridine is an effective drug in the treatment of pneumococcal pneumonia and, if used with regard to its toxic effects, it is a therapeutic agent with a satisfactory margin of safety.

DR. F. JANNEY SMITH, Detroit: In the preceding eight years at the Henry Ford Hospital, 678 adults suffering from lobar pneumonia were treated by all methods. There were 253 deaths, giving a mortality rate of 37 per cent. In the past winter seventy unselected, consecutive adult patients were treated with sulfapyridine. There were six deaths, or a mortality of 8.5 per cent. Two of the patients died after being in the hospital fourteen hours or less. If those could be subtracted, the mortality rate would be 5.5 per cent. The average amount of the drug administered was from 15 to 25 Gm. Failure of prompt defervescence in three cases led to the justifiable suspicion that another organism than the pneumococcus was responsible. Autopsy showed that in two of these instances the staphylococcus was responsible and in one the tubercle bacillus. Nausea was the common toxic manifestation. No serious effect was shown on the blood picture. Illustrating renal toxicity, one patient, a white woman aged 54 with type III pneumonia, whose treatment was begun on the eighth day, showed a 3+ albuminuria and few red cells before the beginning of the drug treatment. After 8 Gm. of the drug, anuria developed. Renal function was reestablished in two days, but a new consolidation developed on the contralateral side and death occurred without further specific treatment. Autopsy and microscopic studies showed acute toxic nephritis with tubular degeneration and focal necrosis, the picture being similar to that seen in some of the metallic poisons, particularly mercury, except that it was focal instead of diffuse. There was also present focal necrosis in the adrenals. Another patient, a white man aged 64 with type IV pneumococci in the sputum and blood, had an excellent response to the drug but died after eighteen hours of normal temperature of a ventricular tachycardia. It is impossible to state whether this complication was due to his disease or whether it was related in any way to the drug therapy.

DR. L. D. THOMPSON, St. Louis: I have observed this winter two series of cases, one treated with type specific serum and one with the drug. The series are not comparable because the serum treated patients were picked. They consisted of types I, II, V, VII, VIII and XIV but no type III patients, whereas the drug treated patients included a large number of youngsters, that is below 2 years of age, and also a large number of type III patients. However, I think that some of the figures are significant. Of the 121 type specific treated patients five died, a mortality rate of 4.13 per cent. When you consider some of the circumstances of those deaths, it is even more striking. Of the five deaths, two were in type I, one patient seen first on the fourteenth day and one seen first on the fifth day. One had type II pneumonia, seen for the first time on the eighth day. Two had type V, one seen on the sixth day and one on the twenty-first day. I can make the statement that in this series no patient seen before the fifth day was lost. Another striking feature was that in the serum treated cases we had an appreciable incidence of type VII and type VIII pneumonia with no deaths at all, although the bacteremia in type VII was 15.3 per cent and in type VIII was 5.2 per cent. In the drug treated cases, 145, we had a gross mortality of 10.3 per cent. Twenty-five odd cases of those were type III, with a mortality rate of 16 and a fraction per cent. In type VII cases, drug treated, we lost one out of four and in type VIII, drug treated cases, we lost one out of six. Neither of these deaths occurred in a case of bacteremia. In this small series the drug appeared to be definitely less

efficient for types VII and VIII than did the type specific serum. Another point of difference with the drug treated series is that three patients seen before the fifth day died, one type III, one type XVIII and one we were unable to type.

DR. JESSE G. M. BULLOWA, New York: How can we select patients who require serum as well as sulfapyridine? Drs. Bukantz, deGara and I studied the concentration of polysaccharide in the blood of twenty-five patients. Twenty-one had either small amounts or no polysaccharide. These patients all recovered after treatment with sulfapyridine, with serum and with the combination. The four patients who had large amounts of polysaccharide in the blood died. A patient with pneumococcus type VII pneumonia was seen on the third day of the illness and was refractory to serum given in large amount. The elevated temperature continued and on the ninth day, when the blood was heavily invaded, he was given serum and sulfapyridine. He was very much improved. When the sulfapyridine was stopped after a period of eight days, the patient again became ill, and on the thirty-second day of the illness he was again given sulfapyridine, with the result that the temperature and the pulse fell. During this time the patient made his own antibodies. The fall in concentration of capsular polysaccharide was coincident with clinical improvement. Then treatment was withheld for a while. He had a persistent atelectasis, which on bronchoscopy showed granulation tissue in the bronchus. The atelectasis cleared, but the blood of the patient, who was apparently getting well, was reinvested. This time meningitis developed. The patient's organisms had apparently become fast to the sulfapyridine, and ultimately, having developed a bacterial endocarditis, he died. It is possible that pneumococci of types II and V, which are related, may be more resistant to the action of sulfapyridine than some other pneumococci. A patient 29 years of age, with a pneumococcus type II pneumonia, was treated on the third day, receiving an initial dose of 5 Gm. of sulfapyridine and 1 Gm. every four hours thereafter. Though we obtained a concentration of 7.5 mg. of free sulfapyridine per hundred cubic centimeters, the patient died on the fourth day with a rising temperature. The requirement of an adequate concentration of sulfapyridine is illustrated by a patient who had a double infection, in whom pneumococcus type IX was found in the sputum and pneumococcus type V in the blood on the third day. There were then only six colonies. He received 240,000 units of pneumococcus type IX rabbit serum; his temperature and pulse fell on the fifth day and there were antibodies for pneumococcus type IX. We did not obtain a very high concentration of sulfapyridine in spite of the unusually high dosage. On the fourth day he had 1.7 mg. per hundred cubic centimeters of blood. Apparently the sulfapyridine had no effect on the bacteremia due to pneumococcus type V; it had increased on the fifth day to 123 colonies. He died on the sixth day.

DR. W. D. SUTLIFF, New York: Drs. Plummer and Ensworth and other workers with hospital facilities are laying a firm foundation for the use of sulfapyridine in general practice. They are showing not only that sulfapyridine is an effective therapeutic agent but that it must be used with certain precautions. During the same period as that during which the authors' figures were collected, the pneumonia control division of the New York City Department of Health assembled similar figures from a large number of physicians for patients treated at home as well as in the hospital. During January, February and March 1939 a total of 1,354 reports were returned by physicians who received serum from the department of health. Pneumonia cases caused by eight different pneumococcus types were treated with serum. The fatality rate varied from 4.5 per cent for 396 serum treated type I cases to 13.7 per cent in ninety-five type II cases. Fatality rates for other types ranged between these two extremes, with the exception of type XIV, which showed the very low fatality rate of 2.4 per cent in eighty-five cases, owing in part to the fact that this type was found in children and infants in about 50 per cent of the cases. Chemotherapy was employed by the general practitioner for only 228 patients. It was apparently employed for patients who were more seriously ill, as the fatality rate of 228 patients who had both serum and chemotherapy was 17 per cent. The gross fatality rate for all patients treated with serum or treated with chemotherapy in addition to serum was 8.8 per cent. All cases of certain pneumococcus types were treated with rabbit serum, and all cases of

other pneumococcus types were treated with horse serum and the results were equally satisfactory. Since April 15, when sulfapyridine was released for general sale, 126 patients treated with sulfapyridine alone have been reported to the New York City Department of Health, Pneumonia Control Division. This group of cases shows a fatality rate of 5.6 per cent, which approximates closely to that reported by Drs. Plummer and Ensworth and other observers in hospital practice. These cases all had bacteriologic diagnosis performed in the New York City Department of Health, Pneumonia Control Division stations.

DR. HERBERT K. ENSWORTH, New York: The question of picking cases for treatment with sulfapyridine or with serum or the combination is something which will have to be worked out. Fleming recently published in the *Lancet* a bacteriologic means of doing so which takes twenty-four hours. He determines whether the particular strain of the inciting organism is susceptible to sulfapyridine or not. That is an interesting way of doing it; if the process can be shortened so that we can get treatment started without undue delay it may be very valuable. Dr. Bullowa's demonstration of the significance of the polysaccharides in the urine is interesting also and it may be that from this will develop another useful aid in selecting the method of therapy most suitable for the individual patient. The present day results with serum, as Dr. Sutliff showed, are excellent. I think it shows one thing about serum, that serum is getting better; it is becoming more refined, more concentrated and more effective. All the reports of serum in recent times have shown results superior to those obtained with the serum of the older days. This also applies to type III serum, formerly thought to be of little value. We and others have seen type III pneumonia cases in which definite improvement which appeared to be due to serum has occurred. At the present time, however, sulfapyridine appears to be lowering the mortality rate in all types even more than serum does.

THE ETIOLOGIC DIAGNOSIS OF PNEUMONIA IN CHILDREN BY RAPID TYPING OF NASAL CULTURES

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Advances in the treatment of pneumonia both with serum and with drugs have increased the importance of the etiologic diagnosis. In children, attempts to circumvent delay due to lack of sputum by obtaining tracheal specimens have been made by Bullowa¹ and by Krahulik, Rudomanski and Cunningham.²

Beebe,³ Kneeland⁴ and Webster and Hughes⁵ reported that in respiratory infections in children the respiratory pathogens, e. g. pneumococcus, influenza bacillus and hemolytic streptococcus, appear in cultures from the nasal passages. In the middle fossae of the nose in cases of lobar pneumonia, Felty and Heatley⁶ described the presence of pneumococci which corresponded to the type found in the sputum. Baker⁷ found that in early pneumonia in children the highly parasitic pneumococcus type I could be quickly

From the Children's Center of the New Haven Orphan Asylum and the Department of Pediatrics of the Yale University School of Medicine. Aided by grants from the Fluid Research Fund of the Yale University School of Medicine.

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6. Felty, A. R., and Heatley, C. A.: The Nasal Passages in Lobar Pneumonia, *J. A. M. A.* 86: 1195-1197 (April 17) 1926.

7. Baker, Conrad: Nose Cultures in Children with Lobar Pneumonia, Thesis, Yale University, 1931.

recovered from nasal swabs through mouse inoculation. These observations led us to explore the possibility of rapid typing of pneumonia in children using the quellung reaction on pneumococci which might appear in blood broth inoculated with a nasal swab.

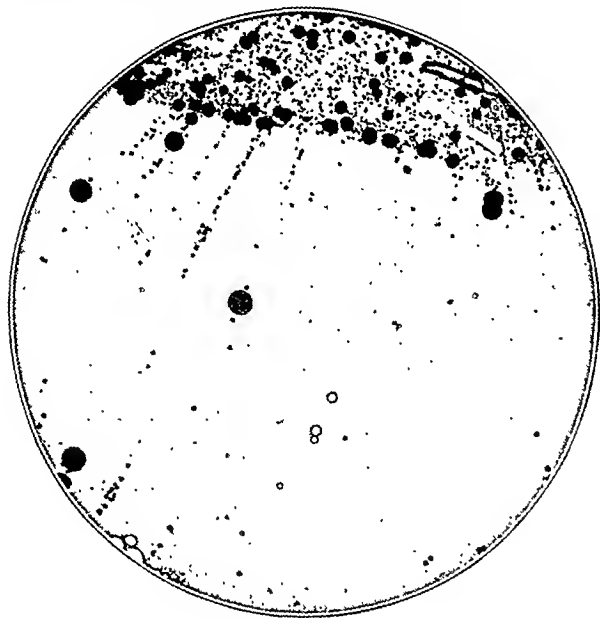


Fig. 1.—Simplicity of normal flora.

METHOD OF STUDY

The basic medium was a fresh beef heart infusion broth with 2 per cent defibrinated rabbit's blood, 1 cc. volumes being used in ordinary test tubes and kept on the desk. The beef hearts were infused within twenty-four hours of slaughtering. The small volume and storage at room temperature were used to shorten the period of incubation. The nasal swab consisted of the ordinary wooden applicator tipped with cotton. The culture of the nose was taken by passing the swabs far back into the nasopharynx. Sometimes this was possible in only one nostril. One swab was left in the tube of blood broth and incubated at 37.5 C. Another swab taken at the same time was used to streak a blood agar plate made up of fresh beef heart blood agar with 5 per cent defibrinated rabbit's blood. The second swab was then placed in a tube of plain broth; after shaking, 1 cc. of the fluid was inoculated into a white mouse.

The clinical material consisted of patients suspected of having pneumonia admitted to the pediatric service of the New Haven Hospital. Of these, thirty-two proved to have lobar pneumonia, eight bronchopneumonia, one capillary bronchitis, two bronchitis and five acute upper respiratory infections and questionable pneumonias.

RESULTS

Figures 1 and 2 are reproductions of photographs of nasal cultures on blood agar plates in a normal child and in lobar pneumonia respectively. Figure 1 (normal) shows the simplicity of the normal flora, which consists merely of diphtheroids and staphylococci.

Figure 2 (lobar pneumonia) shows the predominance of pneumococci that in cases of pneumonia one can get the pneumococci in almost pure culture from the nose and that only a small volume of medium is required constitute the basis of the success of the method.

Thirty-four cases of pneumonia and severe respiratory infections were typed by the rapid method. The

time required in typing ranged from one and three-quarters hours to six hours. In the average case from three to four hours' incubation of the 1 cc. volumes of blood broth inoculated in the manner described was all that was necessary to obtain a culture suitable for a typing of the pneumococci. On the other hand, when a 5 cc. volume of blood broth was used, from twelve to eighteen hours was found to be the time necessary for incubation before the quellung reaction could be employed successfully.

The accompanying table, summarizing the cases of lobar pneumonia, bronchopneumonia and upper respiratory infections examined, shows the organisms obtained from the nose and throat, from white mouse inoculation, from blood culture and from exudates from the ear and pleural cavity.

RESULTS

The table shows a contrast between the predominance of the parasitic pneumococcus in the nasal cultures on the one hand and the variety of organisms of the throat on the other hand. Pneumococci were recovered from the nasal cultures in twenty-nine of the thirty-two cases of lobar pneumonia. In six instances a check on the method of the typing by nasal cultures was possible by means of a comparison of types found in blood cultures, pus from the ear, pleural cavity and nose; the nasal method was upheld six times (cases 1, 7, 10, 11, 14 and 18). The nasal method failed in three cases (cases 6, 23 and 32). The unsuccessful examination for pneumococci in the nose, as in cases 6, 23 and 32, was made on the first and second days of disease and could not therefore be ascribed to a late examination, as might have been expected from Baker's work.



Fig. 2.—Predominance of pneumococci in nasal culture from a child with lobar pneumonia.

The three cases in which the method failed were typical of lobar pneumonia in respect to onset, physical signs and roentgenographic evidence.

Several types of pneumococci were recovered from the nose, the throat or other sources in seven cases of lobar pneumonia (cases 4, 5, 17, 21, 27, 29 and 31) and in one case of bronchopneumonia (case 34). In the three instances (cases 4, 5 and 17) in which the distinction could be made, a highly parasitic pneumococcus was found in the nasal culture.

A Comparison of Organisms from Nose and Throat Cultures, Mouse Inoculation, Blood Cultures and Exudates in Pneumonia and Respiratory Infections

Case Number	Day of Disease	Nose Culture				Throat Culture				Organisms from Mouse				Purulent Exudate			Diagnosis
		Pneumococcus Type	Hæmophilus Influenzae	Staphylococcus	Albus or Aureus	Diphtheroids	Gram-Negative Micrococci	Pneumococcus Type	Hæmophilus Influenzae	Staphylococcus	Albus or Aureus	Gram-Negative Micrococci	Pneumococcus Type	Hæmophilus Influenzae	Staphylococcus	Albus or Aureus	
1	1	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia, suppurative otitis media
2	1	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia, suppurative otitis media
3	3	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia
4	3	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia
5	4	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia
6	4	I*	+	+	+	+	+	I	+	+	+	+	I	+	+	+	Lobar pneumonia
7	6	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
8	7	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia, empyema, suppurative otitis media
9	7	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
10	8	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
11	10	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
12	11	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
13	12	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
14	13	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
15	14	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
16	15	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
17	16	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
18	17	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
19	18	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
20	19	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
21	20	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
22	21	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
23	22	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
24	23	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
25	24	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
26	25	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
27	26	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
28	27	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
29	28	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
30	29	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
31	30	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
32	31	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
33	32	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
34	33	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
35	34	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
36	35	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
37	36	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
38	37	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
39	38	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
40	39	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
41	40	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
42	41	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
43	42	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
44	43	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
45	44	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
46	45	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
47	46	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
48	47	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
49	48	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
50	49	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
51	50	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
52	51	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
53	52	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
54	53	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
55	54	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
56	55	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
57	56	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
58	57	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
59	58	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
60	59	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
61	60	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
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65	64	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
66	65	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
67	66	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
68	67	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
69	68	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
70	69	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
71	70	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
72	71	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
73	72	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
74	73	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
75	74	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
76	75	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
77	76	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
78	77	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
79	78	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
80	79	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
81	80	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
82	81	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
83	82	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
84	83	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
85	84	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
86	85	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
87	86	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
88	87	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
89	88	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
90	89	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
91	90	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
92	91	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
93	92	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
94	93	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
95	94	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
96	95	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
97	96	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
98	97	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
99	98	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia
100	99	IX	+	+	+	+	+	IX	+	+	+	+	IX	+	+	+	Lobar pneumonia

* Predominant organism.

The first day of disease in the pneumonias was calculated as the first day of high fever, cough, vomiting or convulsion.

In five cases of bronchopneumonia the pneumococcus was not found in the throat culture (cases 34, 37, 38, 39 and 40) but was present in the nasal cultures in all but one (case 40). Pneumococci were absent in the throat cultures in seven cases of bronchitis, upper respiratory infections and questionable pneumonias (cases 41, 42, 44, 45, 46, 47 and 48), whereas they were present in every case in the nasal culture. In one case of bronchopneumonia the pneumococcus was not recovered from either the nose or the throat culture, but an unclassified type was obtained from mouse inoculation but not from aural exudate, which contained a hemolytic streptococcus (case 40).

SUMMARY

The method of rapid typing of nasal cultures has some limitations but is of value in the etiologic diagnosis of pneumonia. The method is of special value in pediatrics but, judging from Felty and Heatley,⁶ it may be valuable also among adults. Even with the advent of chemotherapy in pneumonia the method still is of importance, because it is desirable to know whether or not the inciting agent is a pneumococcus or a hemolytic streptococcus. If the etiology is pneumococci it is important to recognize the high parasitic strains which usually occur in lobar pneumonia and to recognize those strains which are more common in bronchopneumonia or the so-called "atypical" or viral pneumonias.

THE SULFAPYRIDINE TREATMENT OF
PNEUMONIA IN CHILDREN

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There have been a number of reports concerning the use of sulfapyridine in the treatment of pneumonia in infancy and childhood during the past few months.¹ A review of the literature will not be made here. The present series of ninety-three cases is reported because of the successful results in lobar (pneumococcus) pneumonia from the use of the drug in small doses and for a short time.

These patients were treated with sulfapyridine in the Children's Medical Service of Bellevue Hospital between January and July 1939. All patients under 12 years of age having pneumonia had a bacteriologic study with cultures from the throat by the technic described² for pneumococcus typing and blood agar plates for streptococcus study in many cases (table 1). No attempt was made to have a control series, since the early results made it seem unfair to withhold the drug from sick children. Our experience with many hundreds of cases during the past years is a reasonable index of the expected course and outcome of pneumonia

in childhood. All patients had roentgenograms taken during the pneumonia with anteroposterior and lateral views, often repeated.

The diagnosis of the clinical forms of pneumonia was made on the basis of criteria previously outlined.³ The varieties studied during this period are noted in table 2. The majority of the patients had lobar pneumonia (seventy-nine of the ninety-three), distributed from 2 months to 13 years of age. There were twenty-nine patients under 2 years with lobar pneumonia and fifty over 2 years (table 1). All of the eleven patients with bronchopneumonia were under 2 years of age.

Sulfapyridine was given by mouth, in most cases crushed and mixed with cereal, apple sauce or fruit juice. It was usually given shortly after a meal to minimize the possibility of nausea or vomiting. In the early cases 0.2 Gm. per kilogram of body weight (1½ grains per pound) was given on the first day, and half this amount on the subsequent days. We soon found that equally prompt defervescence was observed with three fourths of this dosage in children over 2 years. The infants, however, seemed to require the original dosage, and this was continued for them. No child received more than 4.5 Gm. a day, and the average total amount given to a child was 5.48 Gm. The average total dosage for an infant under 2 years was 3.99 Gm.

Half of the patients were treated for only two days and 75 per cent for not more than three days. The average duration of treatment was 2.6 days. It is our experience that if sulfapyridine affects the course of the pneumonia it does so within eighteen to thirty-six hours. In the first few cases treated it was given for from five to six days after the crisis, but the prompt fall of temperature after the drug is begun led us to shorten the time of administration. In the larger part of this series the drug was continued for only eighteen to twenty-four hours after the crisis. No definite recurrences of pneumonia have been noted. Five patients had subsequent short rises of temperature, probably not true relapses of pneumonia.

Blood sulfapyridine determinations were done on many but not on all patients. The concentration was found to vary widely with the same dosage of drug, from less than 1 mg. to 12 mg. per hundred cubic centimeters. Three patients whose concentration was 0.8 mg. per hundred cubic centimeters had a crisis completed within eighteen hours after the drug was given. The average blood sulfapyridine determination was from 2 to 4 mg. per hundred cubic centimeters, and with this level in most cases prompt crisis was noted.

UNFAVORABLE REACTIONS

The most frequent reaction was vomiting, usually of only one or two doses, occurring in 15 per cent of the patients. This symptom was never severe enough to require stopping the drug. Vomiting can be greatly reduced by giving the sulfapyridine with food or directly after meals, a precaution which is often neglected in hospital practice. None of the patients became cyanotic from the drug, although several were cyanotic when it was first given. Extreme restlessness and delirium were observed in four patients, one of whom had a blood sulfapyridine concentration of 12 mg. per hundred cubic centimeters, the highest in our series. This baby had a peculiar agitated expression and constantly threw himself about. His extreme restlessness required the use of

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Subject matter presented before the Panel Discussion on Management of Pneumonia in Infancy and Childhood, Section on Pediatrics, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, *J. A. M. A.* **112**: 518 (Feb. 11) 1939. Flippin, H. F.; Lockwood, J. S.; Pepper, D. S., and Schwartz, Leon: The Treatment of Pneumococcal Pneumonia with Sulfapyridine, *ibid.* **112**: 529 (Feb. 11) 1939. Wilson, A. T.; Spruen, A. H.; Cooper, M. L.; Stevenson, F. E.; Cullen, G. E., and Mitchell, A. G.: Sulfapyridine in the Treatment of Pneumonia in Infancy and Childhood, *ibid.* **112**: 1435 (April 15) 1939.

2. Vinograd, Julia; Nemir, Rosa Lee, and Park, W. H.: The Rapid Typing of Pneumococci by the Neufeld Reaction Directly from Laryngeal Swabs from Infants and Children, *Am. J. Dis. Child.* **51**: 792 (April) 1936.

3. Smith, C. H.; Graef, Irving, and Andrews, Elizabeth T.: Value of Large Sections of the Lung in Pathologic Study of Pneumonia, *Am. J. Dis. Child.* **45**: 1141 (May) 1933; *Grad. Fort. New York Acad. Med.*, Oct. 22, 1935.

restraints to prevent falling out of bed. This agitated restlessness is not a part of any pneumonia picture. All four of these patients presented an alarming state; they had a peculiar intense pallor, although they were not anemic. They were improved by sedatives (phenobarbital), by a large amount of fluids and by discontinuing the drug for one or two doses. Two of these

TABLE 1.—*Bacteriology and Age Distribution of Patients with Pneumonia*

Pneumo- coccus Type	Only One Pneumococcus				More Than One Pneumococcus			
	Under 2 Years		2-13 Years		Under 2 Years		2-13 Years	
	Lobar	Other Forms of Pneu- monia	Lobar	Other Forms of Pneu- monia	Lobar	Other Forms of Pneu- monia	Lobar	Other Forms of Pneu- monia
I.....	2*	..	7	..	1	..	1	..
II.....	2	..	1	..	..	2	..	..
IV.....	1	..	1	..	..	..	2	..
V.....	..	1	4	..	..	1	1	..
VI.....	4	1†	4	..	1	2†	5	1
VII.....	1	..	..	..	1	..	2	..
VIII.....	..	..	1	..	1	..	7	..
XI.....	..	..	..	..	..	..	3	..
XII.....	..	..	..	..	1	..	..	..
XIV.....	4	1†	5	..	4	1	3	..
XV.....	2	..	1	..	..	..	..	..
XVI.....	..	..	..	..	..	..	4	..
XVII.....	1	..	1	..	2	..	1	..
XVIII.....	..	..	..	..	1	..	2	..
XIX.....	1	2†	1	..	2	3†	6	1
XXII.....	1	..	..	..	..	1	..	..
XXIII.....	1	..	..	..	2	1	..	..
XXIV.....	1	..	..	..	..	1	..	..
XXIX.....	..	..	..	..	..	1	..	..
XXXI.....	..	..	..	..	..	1	..	..
XXXII.....	..	..	..	..	..	..	1	..
Pneumococcus unclassified..	1	..	6	1	..	1	1	..
No pneumococ- cus.....	1†	..	5	..	..	..	..	..
Str. viridans...	..	1*	..	..	..	..	..	..
Total patients	22	6	36	1	7	6	14	1

* One case of empyema in each pneumococcus type as indicated.
† One patient died in each pneumococcus type as indicated.

babies were placed in oxygen tents without improvement of the nervous symptoms. A transient mild hematuria was observed in one patient. This child had received only 0.12 Gm. per kilogram of sulfapyridine; hematuria appeared on the third day of treatment and cleared within a few days. It must be pointed out that hematuria occasionally occurs in pneumonia without the use of sulfapyridine. No other toxic symptoms were observed.

RESULTS

The prompt and consistent precipitation of crisis following the oral administration of sulfapyridine has been reported by many observers, and our experience is no different. This reaction occurred within eighteen to twenty-four hours in sixty-nine of the seventy-nine patients with lobar pneumonia. Of course, it is possible that the drop in temperature of some of the patients coincided with the normal crisis, but such an explanation cannot account for all the reactions, particularly in those treated very early in the disease. Many of the patients treated on the eighth to the eleventh day were acutely ill with type XIV pneumonia, in which the average duration is from eight to fourteen days.⁴

It has been stated that, although sulfapyridine provokes a crisis, the disease runs its course, and the consolidation does not resolve sooner than it would have done if untreated. This suggestion is contrary to our experience. The x-ray shadows and the physical signs begin to clear at once just as they do after a normal crisis.

4. Nemir, Rosa Lee: The Significance of Pneumococcus Typing in the Pneumonias of Childhood, read before the Section on Pediatrics, American Medical Association, St. Louis, May 18, 1939, to be published.

The three patients with lobar pneumonia who failed to show the typical response to sulfapyridine were all infants under 2 years of age, all severely ill. It is possible that the sustained temperature, in the first one of these patients was a febrile evidence of sulfapyridine intolerance or intoxication, since this baby had other signs of reaction, namely extreme restlessness, delirium, pallor and marked anorexia. His blood sulfapyridine determination was 12 mg. per hundred cubic centimeters. The second patient is remarkable only because he required forty-eight hours' therapy to produce a crisis. The third baby had pneumonia three times previously at Bellevue Hospital, some of these atypical pneumonia. We cannot explain his unusual reaction to sulfapyridine.

In five cases of lobar pneumonia, although the usual reaction occurred after sulfapyridine, secondary short febrile rises occurred. It has been suggested that the bacteriostatic action of sulfapyridine may produce improvement for a short time and then be followed by a relapse. There were only five patients whose temperature charts might be so interpreted. Only one of these cases clinically appeared like a pneumonia during the second temperature rise which yielded promptly to renewed treatment. The dosage of sulfapyridine was probably inadequate in case 5, but readministration of the drug was followed by prompt crisis. The other three patients had no new signs of pneumonia. One of these received no more drug, and the fever subsided just as promptly as in the cases in which it was given, so that it is not certain that any patients had true relapses. Short febrile episodes are often seen in hospital patients from insignificant causes. These three patients may all have had transient fever not associated with pneumonia. Roentgenograms in all five cases showed clearing pneumonias and no new consolidation. It is noteworthy that four of the five patients had pneumococcus type XIV pneumonia, a disease known for its severity. It is suggested also that type XIV pneumonia may require a somewhat greater dosage than the other pneumococcic pneumonias.

TABLE 2.—*Clinical Diagnosis of Patients Studied*

	Number of Patients			
	Total	Lived	Died	Empyema
Lobar pneumonia.....	79	78	1*	2*
Bronchopneumonia.....	11	7	4†	1†
Lobular pneumonia.....	1	0	1 (autopsy)	..
"Subacute" pneumonia†	2	2	..	..

* Patient who died had pyopneumothorax, pneumococcus unclassified 1-32.

† One infant died and was found to have pneumothorax XIX empyema.

‡ Type of pneumonia described by Lincoln, E. M.; Smith, C. M., and Kirmse, T. W.: Subacute Pneumonia in Children, J. Pediat., to be published.

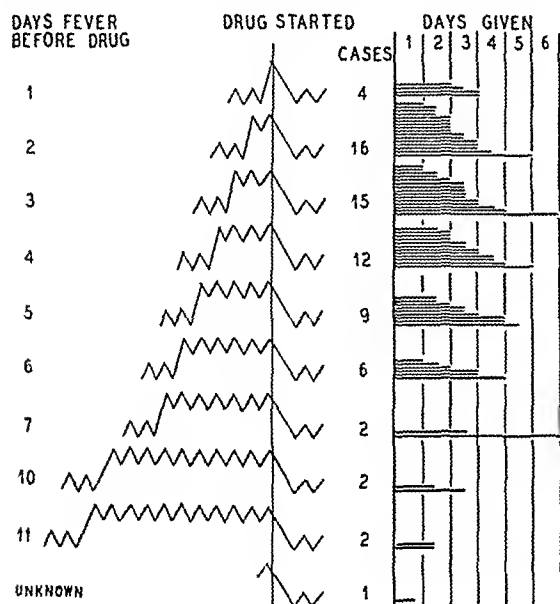
In eleven cases of true bronchopneumonia we have failed to observe the same dramatic, prompt response to sulfapyridine seen in cases of lobar pneumonia. The temperature of the patients with bronchopneumonia remained elevated, and they seemed only slightly improved. Our series of this form of pneumonia this year is small, however. Four of the eleven patients died, approximately the average mortality rate for bronchopneumonia during the past eight years. A much longer time will be needed to evaluate sulfapyridine therapy in this form of pneumonia. Kohn⁵ reports no

5. Kohn, Jerome, et al.: Sulfapyridine Treatment in Infants and Children, Including Treatment of Pneumonia During Pertussis, read before American Academy of Pediatrics, Region 1, New York, in June 1939; abstr., J. Pediat. 15: 449 (Sept.) 1939.

effect on bronchopneumonia in his experience at the Willard Parker Hospital.

One patient clinically thought to have bronchopneumonia died and at autopsy was found to have lobular pneumonia, probably from aspiration. The walls of the bronchi were normal. This 6½ months old baby was admitted to the hospital for a diarrhea from which he was recovering when he developed pneumonia. Type XIX pneumococcus was found. The baby was treated promptly with sulfapyridine but died within thirty-six hours after the onset of the pneumonia.

There was one death among the seventy-nine patients with lobar pneumonia. This severely ill 16 months old baby died suddenly on the third day after admission to



TOTAL WITH CRISIS IN 1 DAY 69

Typical response of sixty-nine cases of lobar pneumonia in which there was a crisis within twenty-four hours after sulfapyridine was started. At the right is shown the number of days the drug was given in each case. Note the short duration of its administration in all except a few (early) cases.

the hospital. A roentgenogram taken the day before death showed a pyopneumothorax (not diagnosed clinically), which was probably responsible for the death. No autopsy was obtained.

Only one patient developed empyema, an infant with type I lobar pneumonia. He developed physical signs, and a roentgenogram indicated suppurative pleurisy. On pleural tap 2 cc. of thick pus was removed, from which type I pneumococcus was cultured. No further pus was ever found and the patient promptly recovered. This abortive course of empyema has been rarely encountered in our many years of observation of empyema, especially that following type I pneumonia.

Pneumococcic bacteremia was found in only one patient, a boy of 8 years, with type I lobar pneumonia. His defervescence occurred within eighteen hours in the typical manner. The drug was cut after thirty-six hours, and the report of the blood stream invasion was obtained after the drug had been discontinued. Even with this small amount of therapy, the blood stream was sterile. As a precaution the drug was readministered for twenty-four hours, but all further blood cultures were sterile. Streptococcus viridans was found in two blood cultures from a patient with bronchopneumonia. The blood cultures were sterile after several days' treatment with sulfapyridine, and the patient recovered.

COMMENT

The consistent prompt crises observed in our patients with lobar pneumonia following the oral use of sulfapyridine is convincing to us that the drug is very efficacious in treating pneumococcic pneumonia (and perhaps also that due to the streptococcus). But the value of a therapeutic agent in pneumonia cannot be established in one season's time, since pneumococci are known to vary in their distribution and virulence from year to year. It may be that results will be less good in more serious epidemics.

In the present season we have had a lower percentage of type I pneumonia (10.9 per cent for the present year as compared to 17.8 per cent average for the past six years). There were probably more mild cases this season than usual, although many patients were very severely ill.

The failure of bronchopneumonia to respond favorably to sulfapyridine may be explained on the basis of etiology, since the bacteriology is variable and often no pneumococci are found. If a filtrable virus is the etiologic agent of bronchopneumonia, as has been suggested by various workers and by some experimental work with animals,⁶ the explanation for the different reactions of these patients to the drug is probably indicated. Sulfapyridine has not been especially useful for diseases due to filtrable viruses.

For the older child sulfapyridine may well be the answer to the treatment of lobar pneumonia in the great majority of cases. In this age group (2 to 13 years) pneumonia is a milder disease with a much lower incidence of bacteremia and deaths than in adults. Even though the death rate in children may not be greatly affected, since it is already low, the shortening of the disease and the avoidance of complications justify the use of the drug. There may always be some patients who will require specific antipneumococcus serum therapy as well as the bacteriostatic agent sulfapyridine. Infants who are debilitated, chronically ill or anemic and who may be unable to produce their own immune bodies may need specific serum as well as sulfapyridine. The necessity for obtaining a pneumococcus typing, preferably before chemotherapy is given, is clear. If sulfapyridine is not effective in the usual time, from eighteen to twenty-four hours, specific serum may be given without delay if typing has already been done. In comparing results from different clinics with sulfapyridine in pneumonia, it is important to compare the results with reference to the types of pneumococci. It is known that the duration, severity and fatality of pneumonia is directly associated with the pneumococcus types.

We wish to reiterate that it is not necessary to continue sulfapyridine for many days in the fear of a relapse. In this series the drug was given only 2.6 days on an average. If the few early cases are excluded, this time drops to 2.3 days. The average total amount was 3.99 Gm. for infants under 2 years and 5.48 Gm. for patients 2 years of age and over. The largest amount given to any patient was 13.25 Gm. The advice to "try to stop the drug after 300-450 grains (20-30 Gm.) have been given"⁷ seems unwise in suggesting that these large amounts are usually needed. Sulfapyridine may be a poisonous drug in some cases, as is indicated by the reports of cyanosis, hematuria, leuko-

6. McCordock, H. A., and Muckenfuss, R. S.: Similarity of Virus Pneumonia in Animal to Epidemic Influenza and Interstitial Bronchopneumonia in Man, *Am. J. Path.* 9: 221 (March) 1933.

7. Report of the Committee on Immunization and Therapeutic Procedures. American Academy of Pediatrics, June 1939, p. 13.

penia, delirium, liver damage and even death associated with the use of the drug. We believe that sulfapyridine should be given no longer than is necessary to effect a crisis and should be stopped very soon thereafter. To continue medication longer is unfair to the patient, just as it is with any drug having a cumulative poisonous action. The fact that we have observed no true relapses and have had no toxic symptoms of importance indicates the value of a wider trial of the small dose and short administration. Others⁶ have produced a crisis by one day's treatment and even by a single large dose.

RESULTS

1. From January to July 1939, ninety-three patients were treated with sulfapyridine; seventy-nine with lobar pneumonia, eleven with bronchopneumonia, one with lobular pneumonia and two whose pneumonia was classified as "subacute pneumonia."

2. In bronchopneumonia there was no apparent effect on the course in any of the eleven patients, four of whom did not survive.

3. In uncomplicated lobar pneumonia with small dosage, for two or three days only, a crisis occurred within eighteen to twenty-four hours in seventy-four of the seventy-nine cases. In the five other cases crisis occurred in forty-eight hours. One death occurred from pyopneumothorax. The short duration of therapy is emphasized not only because of its success but also because of the very few untoward reactions observed.

Twenty-Seventh Street and First Avenue.

CONGENITAL LESIONS OF THE NECK

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LOS ANGELES

The neck with its complex embryologic evolution is particularly subject to developmental anomalies. Among these may be mentioned branchial cysts and fistulas, cystic hygromas, submaxillary and submental inclusion cysts, dermoids, an accessory auditory canal, a lingual thyroid and an aberrant thyroid.

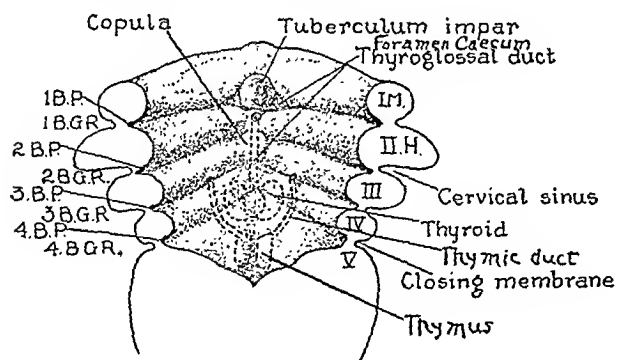


Fig. 1.—Schematic drawing showing development of branchial apparatus. I. M., mandibular arch; II. H., hyoid arch; III, IV, V, third, fourth and fifth branchial arches; 1 B. P., 2 B. P., 3 B. P., first, second and third branchial pouches; 1 B. G. R., 2 B. G. R., 3 B. G. R., 4 B. G. R., first, second, third and fourth branchial grooves.

Successful surgical assault of any congenital lesion consists of a complete reversal of the embryonic processes causing the condition in question. Obviously, in the subject being discussed at least a working knowl-

edge of the embryologic anatomy of the neck is essential. The frequency of recurrences noted following surgical attack is evident testimony to the fact that a fundamental knowledge of the subject is not generally held. In the short space allotted, therefore, I shall sketch diagram-



Fig. 2.—Appearance of branchial fistula tract which has been injected with iodized oil. Note direction corresponding to the sternomastoid muscle and medial arching of the tract at the level of the middle portion of the posterior belly of the digastric muscle.

atically a rough working model of some of the embryology of the neck and its relationship to some of the common anomalies.

EMBRYOLOGY

Although noteworthy studies of the branchial apparatus have been made by His, Rathke, Born and others, undoubtedly the greatest single contribution is that of Wenglowski,¹ who in 1912 published a monograph giving the results of a detailed study of serial sections of a large number of human embryos from 2 to 49 mm. in length. The clinical applications of these results were shown by Herbert Willy Meyer² in a series of studies published in 1932.

During the second week of embryonic life certain changes take place in the fetal foregut (fig. 1). From the interior lateral walls five outpouchings occur. These are the branchial pouches. Simultaneously the external ectoderm becomes indented over the corresponding pharyngeal pouches. These are the branchial grooves. The pouches and grooves approach each other so that entoderm and ectoderm come into contact, the contracting area being the closing membranes, which in gill bearing animals disappear, forming the gill clefts, which open from the pharynx to the exterior. The mesoderm is thus pushed aside into six rounded bars, the branchial arches, of which the first two partially telescope over the remainder, forming the cervical sinus. Each arch

1. Wenglowski, R.: Ueber den Halsfisteln und Cysten, Arch. f. Klin. Chir. 95: 151-208, 1912.

2. Meyer, H. W.: Congenital Cysts and Fistulae of the Neck, Ann. Surg. 95: 226-248 (Feb.) 1932; footnote 3.

contains a cartilaginous bar and in each is also the anlage of one of the primitive aortic arches.

The first or mandibular arch gives origin to the muscles of mastication, lower lip, mandible and anterior part of the tongue, while the cartilaginous bar forms portions of the middle ear and mandible. From the second or hyoid arch are developed the structures of the upper part of the neck and from its cartilage the styloid process, the styloid ligament, the lesser cornu of the hyoid and, with assistance of the third arch, the body of the hyoid and posterior part of the tongue.

The remaining arches all give origin to structures in the vicinity of the hyoid, the sixth giving origin to the cricoid, arytenoid and tracheal cartilages.

As to the branchial grooves, no traces persist of any with the exception of the first, which gives origin to portions of the auricle and external acoustic meatus and with it the possible, although rare, congenital anomaly of the accessory ear.

Proceeding to the interior, one notes that from the first branchial pouch are formed the auditory tube and the tympanic cavity, the tympanic membrane arising directly from the first closing membrane. In the second pouch lies the angle of the tonsil; but of particular significance is the third pouch.

BRANCHIAL CYSTS AND FISTULAS

Wenglowski¹ demonstrated that from the third pouch on either side two tubules descend into the mediastinum to form the thymus. The course of these

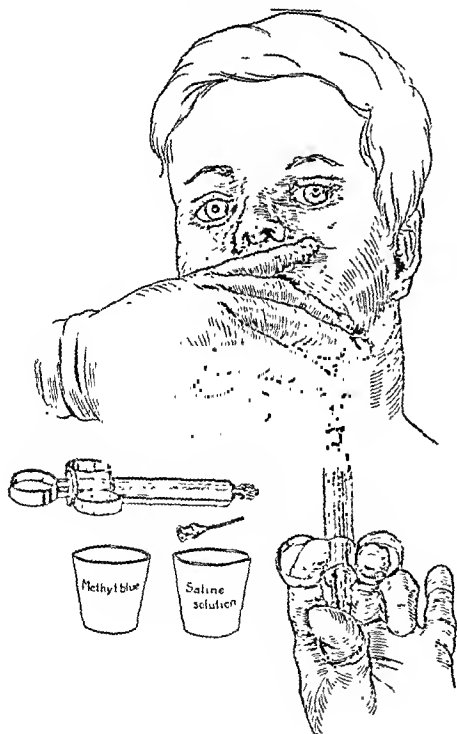


Fig. 3.—Excision of branchial fistula, showing armamentarium and method of massaging methylene blue into the tract. (By courtesy of Surgery, Gynecology and Obstetrics.)

tubules is in the general direction of the sternomastoid muscles, laterally to the thyroid and anterior to the carotid sheath. Furthermore, Wenglowski was able to demonstrate remnants of this tubule in adult necropsy dissection.

There are several theories regarding the evolution of branchial cysts and fistulas: 1. That they are caused

by vestigial remains of the branchial grooves or pouches. 2. That they are a result of an embryonic perforation of the closing membrane. 3. That they are a persistence of the cervical sinus formed by a telescoping of the rapidly growing first and second arches over the remain-

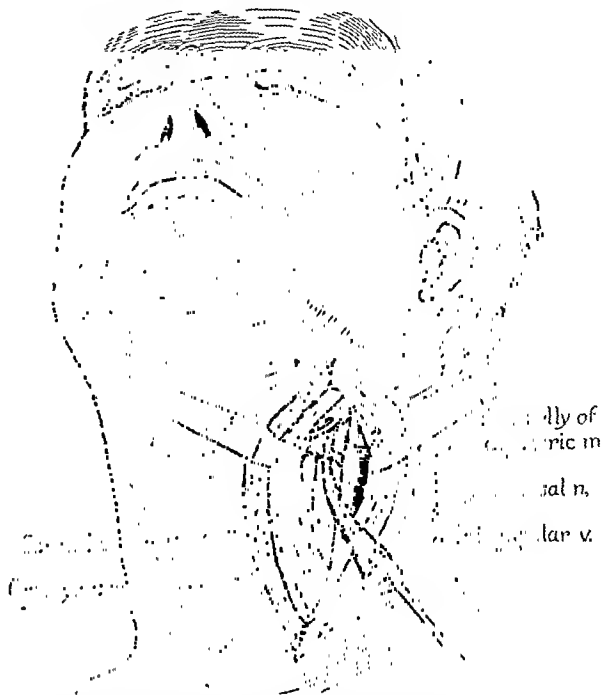


Fig. 4.—Branchial fistula. The tract lies along and beneath the sternomastoid muscle and extends up to the midportion of the posterior belly of the digastric, where it arches medially to enter the tonsillar fossa.

ing arches. 4. That they are due to remains of the thymic duct, which descends from the third pharyngeal pouch, as demonstrated by Wenglowski in 1912.

Now as one compares the anatomic direction of the descent of the thymic duct with that of so-called branchial cysts and fistulas, one finds a rather exact corollary. Clinically these manifest themselves as a fistula or cyst containing a mucoid or milky material, having a uniformly characteristic position along the anterior border of the sternomastoid, extending under it but lying anterior to the carotid sheath. Although occurring at any level of the neck, the tract invariably runs upward beneath the anterior portion of the sternomastoid muscle to the posterior belly of the digastric, where it arches medially behind the stylopharyngeus muscle to end in the tonsillar fossa. The course can at times be demonstrated by x-ray examination preceded by iodized oil injection of the tract (fig. 2). The tract is lined with ciliated epithelium and layers of squamous epithelium surrounded by stroma infiltrated with round cells. As Herbert Willy Meyer has pointed out in his studies in 1932³ and again in 1937,⁴ these have nothing whatever to do with any branchial cleft affairs and should therefore be considered as thymic duct cysts and fistulas. Complete removal to the pharynx is of course necessary. I prefer to inject the tract with methylene blue (fig. 3) and follow this with a saline irrigation to remove the excess stain. This prevents discoloration of the surrounding territory during the dissection to

3. Meyer, H. W.: Congenital Cysts and Fistulae of the Neck, *Ann. Surg.* 95:1-26 (Jan.) 1932.

4. Meyer, H. W.: True Branchiogenic Cyst and Fistula of the Neck, *Arch. Surg.* 35:766 (Oct.) 1937.

follow (fig. 4). On completion of the dissection, the stump should be inverted into the pharynx when this is possible (fig. 5).

True branchiogenic fistulas do occur, but they are indeed rare and must occur within the realm of the

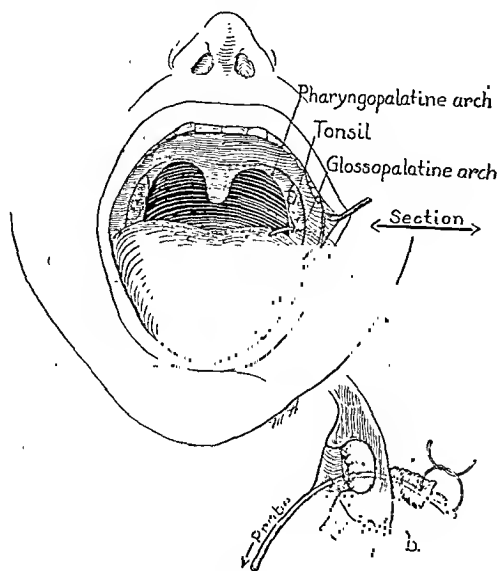


Fig. 5.—Branchial fistula. Tract has been dissected up to arched passage into the pharynx; b, method of immersion of stump.

branchial apparatus, which at best is not much lower than the hyoid, and the tract, instead of being lined with squamous epithelium, is lined with vestiges of skin, hair follicles, sweat glands and sebaceous glands.

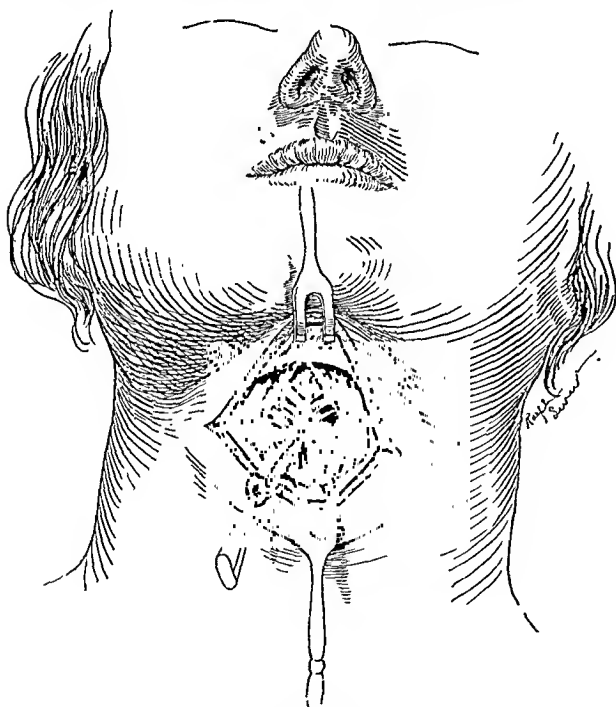


Fig. 6.—Excision of thyroglossal duct fistula. The platysma muscle has been reflected and dissection carried to the hyoid bone. (By courtesy of Surgery, Gynecology and Obstetrics.)

ABERRANT THYROID

Proceeding with the embryologic study, Wenglowski found that from the fourth pouch not only the parathyroids developed but that a comparatively short tubule passed on either side in a somewhat medial

direction to form the lateral lobes of the thyroid. Now it is not universally agreed that the thyroid has more than one anlage, but the distribution of aberrant thyroids can certainly be explained on this basis.

LINGUAL THYROID AND THYROGLOSSAL DUCT CYSTS AND FISTULAS

During the third week two rounded buds appear on the ventral side of the first two arches. The anterior bud, the tuberculum impar, forms the anterior part, and the posterior bud, the copula, forms the posterior part of the tongue. From a depression—the foramen caecum—between the two buds a tubule descends to and around the hyoid bone and proceeds downward to be the anlage of the thyroid. This tubule is the thyroglossal duct. Any arrest above the hyoid in its descent will result in the anomalous lingual thyroid, which

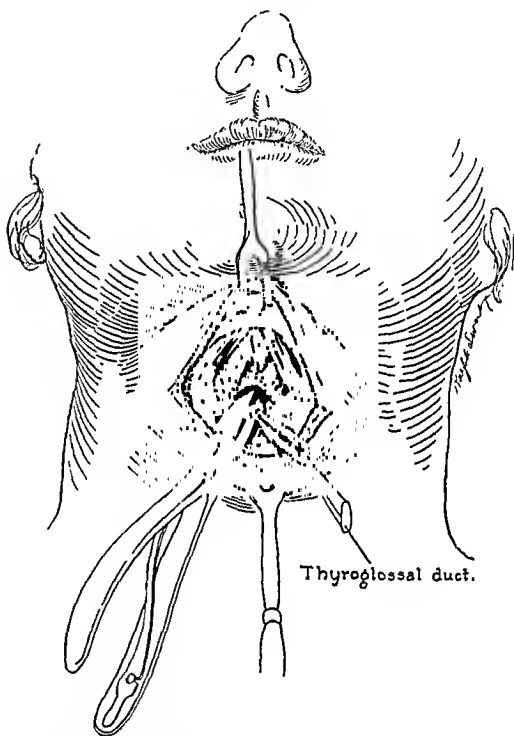


Fig. 7.—Excision of thyroglossal duct fistula. The midportion of the hyoid bone is being removed with bone forceps, according to the method of Sistrunk. (By courtesy of Surgery, Gynecology and Obstetrics.)

Catell and Hoover⁵ reported as occurring only twice in 7,600 thyroids operated on at the Lahey Clinic. Normally the duct atrophies, but when it remains patent in any portion a thyroglossal duct cyst or a fistula is the result.

The clinical picture is that of a cyst or fistula, which occurs near the middle of the neck, usually just below the hyoid, and moves up on swallowing. With the fistulous opening there is either a continuous or an intermittent discharge of mucoid material. Troublesome symptoms such as a choking sensation and difficulty in swallowing are rare, but secondary infection is fairly common. All too frequently the cyst is mistaken for an abscess, and consequently a history of repeated incision and drainage without cure is often noted. Adequate surgical approach was first described

5. Catell, R. B., and Hoover, W. B.: Lingual Thyroid Gland: Report of Case and Discussion of Aberrant Thyroid Tissue. *S. Clin. North America* 9: 1355-1362 (Dec.) 1929.

by Sistrunk.⁶ It consists of a horizontal incision surrounding the fistula or cyst (fig. 6). A central segment of the hyoid is then removed (fig. 7) and, since identity of the duct is usually lost between it and the foramen caecum, a portion of the tongue tissue is cored out between these two points (fig. 8).

SUBMAXILLARY AND SUBMENTAL INCLUSION CYSTS

The submaxillary and submental glands are formed in the alveolar lingual groove directly behind the first arch. They begin as small furrows, the posterior parts of which close over to give rise to a number of buds forming lobules of the gland. Any obliteration of these tubules will produce inclusion cysts, in which case surgical assault consists in removal of the offending gland itself.

CYSTIC HYGROMA

In a recent review⁷ of congenital lesions of the neck I reported eleven thyroglossal duct cysts and fistulas and four so-called branchial cysts and fistulas. We had at that time four cases of cystic hygroma. After a

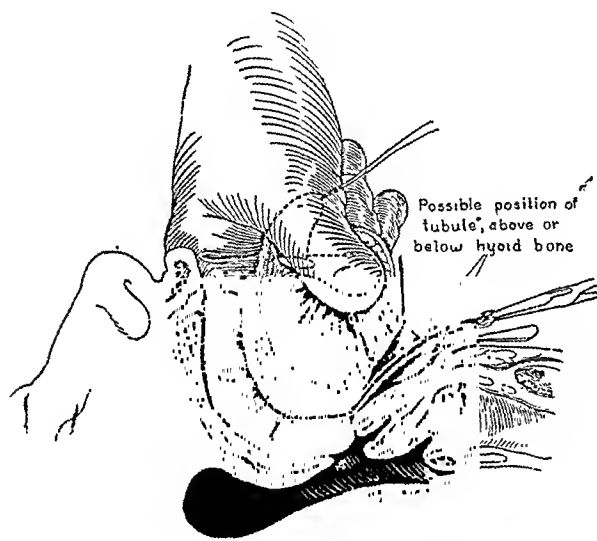


Fig. 8.—Excision of thyroglossal duct fistula. The midportion of the hyoid bone has been removed. From this point the tract is cored out in the direction of the foramen caecum, which is about a 45 degree angle, with the patient in the goiter position. Dissection is carried up to a point at which the finger at the foramen caecum can be identified, according to the method of Sistrunk. (By courtesy of Surgery, Gynecology and Obstetrics.)

thorough study of cystic hygroma, Emil Goetsch⁸ came to the conclusion that these probably arise from sequestrations of lymphatic tissue derived from the primitive jugular sacs which failed to join the regular lymphatic system. The tumor is a multilocular tumor (fig. 9) lined with endothelium and containing a clear or straw colored fluid, usually located in the neck near the junction of the internal jugular and subclavian veins. Diagnosis is often as easy as the treatment is difficult. These lesions have invasive properties into any and all surrounding structures, making complete removal usually an absolute impossibility, and this, associated with a high susceptibility to infection, results in a rather high mortality. Figi⁹ has recommended irradiation but reports a rather high mortality, and I am inclined to

agree with Fleming¹⁰ and Goetsch⁸ that as complete an excision as possible is the method of choice, except in large tumors in very young infants, in whom radiation might be attempted. I have seen one patient apparently cured following an infection. In that par-

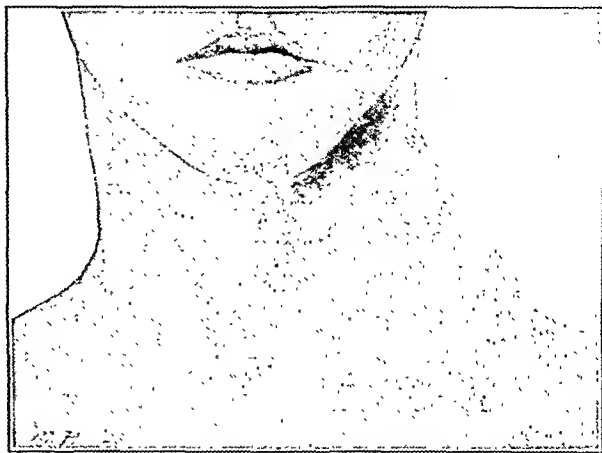


Fig. 9.—Cystic hygroma, showing usual location of the multilocular cystic mass.

ticular case an infection of a cystic hygroma followed a septic throat which necessitated an attempt to relieve the obstructive dyspnea by surgical intervention. Inva-

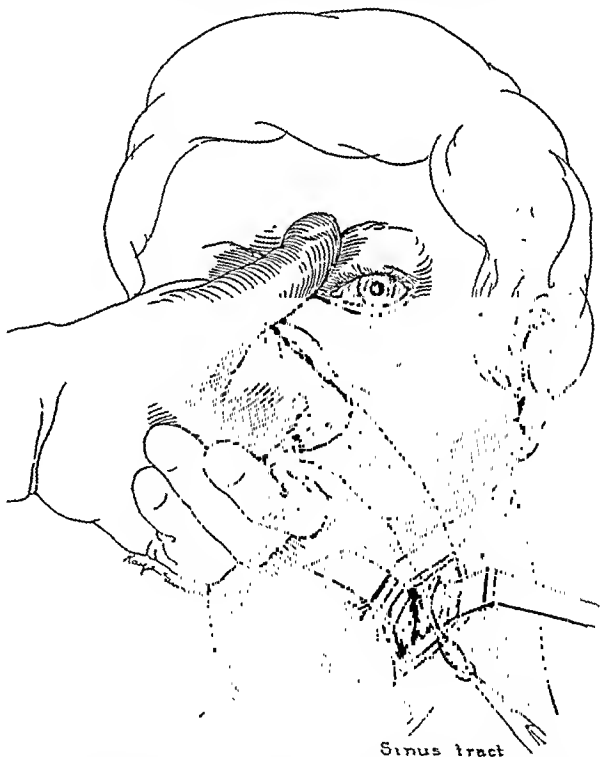


Fig. 10.—Excision of branchial fistula, showing assistant's finger pushing outward in the region of the tonsillar fossa, as dissection is carried to the pharynx. (By courtesy of Surgery, Gynecology and Obstetrics.)

sion of tiny cysts into the muscles could be noted everywhere well down into the mediastinum and surgical removal was considered most incomplete, yet after a stormy convalescence there is no evidence of tumor tissue five years later.

10. Fleming, Bruce: Cystic Hygroma of Neck, *J. A. M. A.* 110: 1899-1900 (June 4) 1938.

6. Sistrunk, W. E.: Thyroglossal Duct, *Ann. Surg.* 71: 121 (Feb.) 1920.

7. Baumgartner, C. J.: *Surg., Gynec. & Obst.* 54: 948-955 (May) 1933.

8. Goetsch, Emil: Hygroma Colli Cystic and Hygroma Axillare, *Arch. Surg.* 36: 394-479 (March) 1938.

9. Figi, F. A.: Radium in Treatment of Multilocular Lymph Cysts in Children, *Am. J. Roentgenol.* 21: 473 (May) 1929.

CONCLUSION

Surgical assault on any congenital lesion of the neck necessitates at least a fundamental knowledge of the embryologic anatomy of the neck. So-called branchial cysts and fistulas are rare, and what are ordinarily called branchial cysts and fistulas should be termed thymic duct cysts and fistulas.

523 West Sixth Street.

ABSTRACT OF DISCUSSION

DR. HERBERT WILLY MEYER, New York: The study of the embryology of the congenital lesions of the neck has always been a fascinating subject. It is an interesting fact that Dr. Wenglowksi, who has probably done more complete work in this investigation than any other author, was a surgeon in Moscow and not an embryologist. His friends, obstetricians and gynecologists, furnished him with seventy-eight embryos ranging in size from 2 to 49 mm. He further performed 144 autopsies on the neck region of infant cadavers and added the study of fifty-nine adult autopsies. Of all of this material he made wax reconstructions and showed the models at the sixth and seventh Russian Surgical Congress. A theory based on such complete and intensive work deserves serious consideration. Wenglowksi studied the branchial apparatus and the development of the neck and such organs as the thymus and thyroid glands. He showed that the branchial apparatus is present in the first and second months of fetal life. Its greatest development is at the end of the first month and it completely disappears by the second half of the second month. The pharyngo-thymic duct develops from the third branchial pouch and passes downward laterally behind the thyroid duct, which develops from the fourth pharyngeal pouch. The two lateral lobes of the thyroid developing from the fourth pouch meet the midthyroid lobe, which descends from the foramen caecum to form the thyroid gland. The two pharyngo-thymic ducts passed downward and forward to meet behind the sternum to form the thymus gland. Normally these ducts disappear completely. If only portions disappear, lateral cysts of the neck develop. If an external opening forms on the skin and the entire duct persists, a complete lateral fistula of the neck develops, emptying into the pharynx through the tonsillar fossa. In the midline, cysts and fistulas of the neck, developing from the lingual duct and the thyroglossal tract, pass downward to the tongue from the foramen caecum. A complete patent tract never is present but only a strand of thickened tissue arising from lingual duct structures or thyroid gland structures. As the hyoid bone develops, it cuts this thyroglossal tract in half by pressure. Frequently gland structures thereby are present under the periosteum and in the midportion of the hyoid bone. Therefore, in order to cure midline cysts and fistulas of the neck, a midportion of the hyoid bone must always be removed and the tract cored out from the tongue. Any cyst or fistula of the lateral portion of the neck above the level of the hyoid bone may be a true remnant of the branchial apparatus. Any cyst or fistula in the lateral portion of the neck below the level of the hyoid must of necessity be a remnant of the pharyngo-thymic apparatus.

DR. CONRAD J. BAUMGARTNER, Los Angeles: I wish to thank Dr. Meyer for his excellent discussion. It is frequently impossible, particularly in children, to invert the stump as shown by previous illustration. I have found it helpful in such cases to have an assistant's finger push outward from the tonsillar fossa in the direction of the dissection. As the finger of the assistant is approached, the stump is severed and ligated.

Heredity and Mental Diseases.—When we consider the nature and etiology of the various mental diseases we become aware of the fact that in less than 40 per cent of the patients admitted to mental hospitals do we find evidence for a hereditary basis, namely, in dementia praecox, manic-depressive, mental deficiency with psychosis, and epilepsy. In the remaining 60 per cent of the patients heredity may play a minor role, but the important etiological factors are probably constitutional (exogenous).—Landis, Carney, and Page, James D.: *Modern Society and Mental Disease*, New York, Farrar & Rinehart, Inc., 1938.

PENTOTHAL SODIUM

IS ITS GROWING POPULARITY JUSTIFIED?

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The intravenous use of pentothal sodium in anesthesia has shown a definite and consistent increase since it was first offered in 1934. A five year interval is too short a period after which to assume a final attitude on any anesthetic drug or technic. Nevertheless it is a sufficient interval to indicate logically a way station in its history at which to pause for a critical survey. Therefore it is our aim here to "examine the record" of that which has taken place to date. This examination will include a brief consideration of the literature, certain observations concerning the technic of its administration, and the scope of its rational application in our hands.

LITERATURE

An editorial of a leading surgical magazine¹ in March 1939 aptly stated the present position of intravenous anesthesia: "The increasing usefulness of intra-

TABLE 1.—*Reports of Administration of Pentothal Sodium*

Cameron.....	225	Kassebohm and Schreiber...	125
Horsley.....	2,000	Jarman and Abel.....	1,000
Valzey.....	1	Murphy.....	100
Dixon.....	18	La Breeque.....	80
Organe and Broad.....	236	Luddy.....	8,500
Carraway and Carraway....	3,559	Ruth and Tovell.....	5,500
Total.....			21,344

venous anesthesia for many types of operations has never been as apparent as it has been recently." This statement may be confirmed further by a perusal of the literature on the subject. More than 100 articles dealing primarily with or touching on the use of pentothal sodium have been published. Medical opinion is found to be predominantly favorable.

In animal experimentation, it has been found that pentothal sodium may produce disturbances of cardiac rhythm.² Conflicting evidence to this statement has also been observed, a brief of which may be presented as follows: A large percentage of animals showed no change in the electrocardiogram, while another group showed disturbances in rhythm and conduction which

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Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Adams, R. Charles: *Intravenous Anesthesia, Surg., Gynec. & Obst.* 68: 719-721 (March) 1939.

2. Gruber, Charles M.; Gruber, Charles M., Jr., and Colosi, Nicholas A.: The Irritability of the Cardiac Vagus Nerve as Influenced by the Intravenous Injection of Barbiturates, Thiobarbiturates and Picrotoxin. *J. Pharmacol. & Exper. Therap.* 63: 215-228 (July) 1938. Gruber, C. M.: The Effects of Anesthetic Doses of Sodium Thiopentobarbital, Sodium Thio-Ethamyl and Pentothal Sodium on the Respiratory System, the Heart and Blood Pressure in Experimental Animals. *ibid.* 60: 143-147 (June) 1937. Gruber, Charles M.; Haury, Victor C., and Gruber, Charles M., Jr.: The Cardiac Arrhythmia, Characteristic Effect of Thiobarbiturates, as Influenced by Changes in Arterial Blood Pressure. *ibid.* 63: 193-213 (June) 1938.

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were temporary.³ The effect on the heart of human beings was insignificant.⁴ Electrocardiographic tracings were essentially negative.⁵ There were no changes or abnormalities in QRS or T waves.⁶ No changes in rhythm were recorded when the drug was administered without the occurrence of cyanosis.⁷ There was no marked deleterious effect on the myocardium or conductive system of the heart demonstrable by the electrocardiographic record.⁸

Focal necroses have been shown to have occurred in the liver in mice.⁹ It is generally conceded that the drug should not be employed in the face of overwhelming hepatic destruction. Only one instance of hepatic disturbance in man was found to be recorded.¹⁰ In that report it was suggested that there was a possibility that the toxic jaundice which developed after the administration of pentothal sodium to this apparently normal individual might have been a coincidental "catarrhal jaundice."

Attention has been called to the occurrence of temporary closure of the glottis and a hyperactive state of the laryngeal reflex, further complicated by frequent coughing. In addition, hiccups or sneezing may occur. It has been suggested that these phenomena are due to parasympathetic overactivity.¹¹ For this the preanesthetic administration of atropine or scopolamine is shown as an adequate prophylactic measure. One investigation on animals suggests the possibility of cumulative action. In this study¹² a dosage identical with the original was injected whenever the signs of light anesthesia presented. This method of procedure would suggest the possibility of overdose; no anesthetic agent that was required for the purpose of induction, when, during the period of maintenance, the patient appeared in light anesthesia. There is reported no change in the urinary secretion or in the concentration of blood urea.¹³ The blood sugar is reported as being raised somewhat, but not sufficiently to cause any practical difficulty in the control of diabetes.¹⁴ The drug causes an immediate depression of intestinal contraction and tonus. This primary effect was transient and succeeded by a more prolonged phase showing increased intestinal contraction and tonus, which persisted throughout the remainder of the anesthetic period.¹⁵

The use of pentothal sodium for diagnostic tests and for the control of convulsions due to the employment of toxic drugs and to tetanus and eclampsia appears to be of definite value.

A summation of the number of instances of the administration of pentothal sodium to human beings recorded in the literature is difficult of determination. It would seem that its use has been somewhat retarded,

TABLE 2.—Variety of Operative Procedures Performed Under Intravenous Pentothal Anesthesia

Types of Operations	No. of Cases	Types of Operations	No. of Cases
Dental		Eye	
Extraction of teeth.....	600	Sclerotomy.....	7
Total.....	600	Enucleation.....	13
Gynecology		Recession and resection.....	7
Dilation and curettage.....	487	Excision of cataract.....	9
Conization.....	53	Excision of cornea.....	5
Radium implantation.....	35	Iridectomy.....	3
Posterior vaginal puncture.....	17	Trephine.....	4
Removal of polyp.....	23	Chalazion.....	3
Examination under anesthesia.....	15	Miscellaneous.....	7
Incision and drainage of Bartholin glands.....	15	Total.....	58
Dehiscence of hymen.....	5		
Replacement of uterus.....	8	Ear, Nose and Throat	
Miscellaneous.....	30	Bronchoscopy.....	3
Total.....	688	Removal of polyp.....	3
Surgical		Antrotomy.....	1
Incision and drainage.....	230	Excision of cancer of antrum.....	1
Excision.....	120	Mastoidectomy.....	1
Hemorrhoidectomy.....	13	Paracentesis tympani.....	5
Suture.....	26	Reduction of fractured nose.....	4
Biopsy.....	12	Biopsy.....	1
Amputation.....	17	Total.....	24
Debridement.....	14		
Plastic operations.....	23	Orthopedics	
Coagulation and cautery.....	26	Reduction of fractures.....	87
Paracentesis abdominis.....	9	Manipulation of joints.....	15
Removal of packs and dressings.....	18	Application of cast.....	21
Thyroidectomy.....	10	Insertion of Steinman pin.....	10
Miscellaneous.....	60	Arthrotomy.....	4
Total.....	606	Internal fixation of hip.....	42
Urology		Sequestrectomy.....	4
Cystoscopy and x-ray examination.....	342	Tenotomy.....	7
Incision.....	86	Miscellaneous.....	8
Fulguration.....	33	Total.....	193
Dilation.....	43		
Transurethral resection.....	26	Neurosurgery	
Removal of calculus.....	8	Encephalogram.....	81
Incision and drainage.....	10	Ventriculogram.....	24
Suprapubic cystotomy.....	8	Burr openings.....	5
Internal and external urethrotomy.....	8	Removal of bone spur.....	1
Insertion of suprapubic drain.....	4	Neurorrhaphy.....	3
Circumcision.....	4	Craniotomy.....	1
Miscellaneous.....	24	Trephine.....	3
Total.....	398	Total.....	148
Dentistry.....	600	Grand total.....	2,980
Gynecology.....	688		
Surgery.....	606	Eye.....	58
Urology.....	598	Ear, nose and throat.....	24
Grand total.....	2,980	Orthopedics.....	198
		Neurosurgery.....	143

initially, by employment of the method of predetermined and nonfractional dosage formerly recommended for the administration of a comparable drug (evipal soluble). This method of dosage placed definite limitations on the use of either drug until such time as the intermittent method of administration was accepted generally. A further difficulty in estimating the number of administrations was presented by the fact that many reports on intravenous pentothal sodium included, in the statistical portions, an unstated number of patients anesthetized by evipal soluble. Nevertheless, 21,344 instances in which pentothal sodium was administered

3. Kohn, Richard, and Lederer, Ludwig: Pentothal Studies with Special Reference to the Electrocardiogram, *J. Lab. & Clin. Med.* **23**: 717-718 (April) 1938.
4. Jarman, Ronald: The Combination of Intravenous with Spinal Anesthesia, Using Pentothal and Percaine, *Brit. J. Anesth.* **15**: 20-24 (Oct.) 1937.
5. Carraway, B. M., and Carraway, C. N.: Intravenous Anesthesia: A Clinical Study of Nineteen Hundred Cases, *Am. J. Surg.* **39**: 576-580 (March) 1938.
6. Volpitta, P. P., and Marangoni, B. A.: Electrocardiographic Studies During Anesthesia with Intravenous Barbiturates, *J. Lab. & Clin. Med.* **23**: 575-581 (March) 1938.
7. Belach, C. J.: The Effects of Pentothal Sodium on the Electrocardiogram of Patients with Essential Hypertension, *Proc. Staff Meet., Mayo Clin.* **13**: 189-191 (March 23) 1938.
8. Thomas, George: Clinical and Laboratory Observations on Intravenous Anesthesia, *Anesth. & Analg.* **17**: 163-168 (May-June) 1938.
9. Reynolds, Chapman; Schenken, John R., and Veal, J. Ross: Pathological Findings in Mice After Pentothal Narcosis, *Anesth. & Analg.* **17**: 357-359 (Nov.-Dec.) 1938.
10. Vaizey, J. M.: Toxic Jaundice Following Administration of Pentothal, *Brit. J. Anesth.* **15**: 55 (Jan.) 1938.
11. Burstein, Charles L., and Roventine, E. A.: Respiratory Parasympathetic Action of Some Short Acting Barbituric Acid Derivatives, *J. Pharmacol. & Exper. Therap.* **63**: 42-50 (May) 1938.
12. Veal, J. R., and Reynolds, Chapman: The Cumulative Effects of Pentothal Sodium, *South. M. J.* **31**: 649 (June) 1938.
13. Tovell, Ralph M., and Thompson, Gershon J.: Pentothal Sodium Anesthesia in Urologic Practice, *J. Urol.* **36**: 81-87 (July) 1936.
14. Belach, C. J., and Tovell, R. M.: Blood Sugar and Blood Urea Determinations Before and After Anesthesia with Pentothal Sodium, unpublished data quoted by Lundy, John S.: Intravenous Anesthesia, *Am. J. Surg.* **34**: 359-370 (Dec.) 1936.
15. Burstein, C. L.: Effect of Some Short-Acting Barbituric Acid Derivatives on Intestinal Activity in Vivo, *Proc. Soc. Exper. Biol. & Med.* **40**: 122-124 (Jan.) 1939.

intravenously to human beings were located (table 1). Of this group 2,980 are reported in detail in tables 2 and 3.

ADMINISTRATION

The preparation of the patient, the chemical and pharmacologic effects and the preparation and method of administration of pentothal sodium have been heretofore adequately described.¹⁶ These aspects will not

TABLE 3.—Additional Statistics from Hartford Hospital Series

	Number	Duration	Minutes
Females.....	1,277	Shortest.....	2
Males.....	723	Average.....	15.9
	2,000	Longest.....	80
	Years	Dosage	5% Solution
Youngest.....	9	Smallest.....	2.0 cc.
Oldest.....	90	Average.....	10.5 cc.
		Largest.....	40.0 cc.
Results		Repeated Administrations	No. Cases
Satisfactory.....	1,936	5 times.....	1
Not satisfactory.....	64	6 times.....	2
Cyanosis.....	34	5 times.....	2
Spasm.....	2	4 times.....	5
Rigidity.....	4	3 times.....	13
Postoperative vomiting.....	2	2 times.....	72
Palor.....	3		
Excitement.....	2	Multiple administrations....	95
Hiccup.....	2		
Miscellaneous.....	15		

be repeated at this time. Certain factors concerning its administration will be emphasized, however, and additional observations presented at this time.

Prior to the publication of the pharmacologic and physiologic explanation of the value of the administration of atropine or scopolamine before pentothal sodium had been given, it was our practice to administer these drugs preoperatively. They not only effectively counteract the parasympathetic overactivity of this drug but minimize the likelihood of production of excessive secretions. Morphine is prescribed in many instances together with the atropine or scopolamine but always in decreased dosages as compared to those prescribed before inhalation anesthesia. (We regard morphine sulfate one-eighth to one-sixth grain [0.0081 to 0.0108 Gm.] as the maximal dose.) In the aged and debilitated, even though morphine is not administered, and in every instance in which their use is possible, either atropine or scopolamine is administered.

Caution regarding the speed of injection cannot be overemphasized. The patient to whom pentothal sodium is being administered has no active mechanism of defense as, for example, is initiated by the irritating action of ether. The facility with which patients may be anesthetized has proved an ever present temptation to make the induction even more startling by the too rapid administration of the drug. A sacrifice of time will increase the factor of safety. It has been our practice recently either to consume from one to two minutes or more for the induction of anesthesia rather than from twenty to thirty seconds, or at least to pause after the injection of 2 cc. of a 5 per cent solution to estimate the depth of anesthesia produced. Recently a 2.5 per cent solution, instead of the usual 5 per cent solution, has been employed with satisfactory results.¹⁷ This solution further facilitates a slow injection and appears to remove the possibility of the rare occurrence of phlebitis.

It should be emphasized that respiratory depression occurs readily following too rapid administration. No difficulty should be encountered if the administration is continued to the point of anesthetic saturation of the tissues of the central nervous system at a rate sufficiently slow to avoid depressive concentrations being carried to the respiratory center. Experience in its administration is the predominant factor in the problem of timing the rate of injection. It appears that it is a mean between a rapid injection, which quickly depresses the respiratory center, and an injection which is sufficiently retarded so that time is allowed for the drug's detoxification before anesthetic concentrations are produced. The function of respiration must be further protected by diligent maintenance of a patent respiratory tract. Relaxation of the soft tissues about the upper respiratory tract is apt to occur and thereby impinge on its patency. At the same time, obtundation of both pharyngeal and laryngeal reflexes does not occur until quite profound anesthesia has become established. Therefore, when an adequate airway cannot be maintained by proper position of the head, insertion of a nasopharyngeal airway rather than a pharyngeal airway should immediately be carried out. At times, if there is an interference with the efficiency of the respiratory tract, recourse should be had to the usual methods for its rectification which are employed during inhalation anesthesia, which include endotracheal intubation. Cyanosis should never be tolerated by the anesthetist. A source of oxygen under low pressure sufficient to inflate the lungs should be constantly available during the administration of pentothal sodium.

CONTRAINDICATIONS

The contraindications noted elsewhere¹⁸ are recognized by us. The drug is not employed when there is a marked physiologic or mechanical interference with respiratory function. At the present time the drug is employed rarely for patients under 15 years of age and

TABLE 4.—Average Effect of Administration of Pentothal Sodium on Blood Chemistry of Twenty-Five Unselected Patients

	Before	After	1 Day After
Dextrose, mg.....	97	109	69
Urea, mg.....	15	17	18
Creatinine, mg.....	1.4	1.3	1.3
Uric acid, mg.....	2.3	2.3	4.0
Cholesterol.....	193	195	159
Carbon dioxide.....	49.1	49.7	49.7
Icterus index.....	6.8	7.9	6.3
Hemoglobin, Gm.....	12.9	12.0	12.9
Red blood cells, millions.....	4.5	4.5	4.4
White blood cells, thousands.....	8.5	8.0	8.8
Bleeding time, minutes.....	1.2	1.1	1.1
Venous coagulation, minutes.....	11.0	12.8	11.3
Differential count			
Polymorphonuclears.....	73.5	73.1	76.5
Lymphocytes.....	23.0	23.7	19.5
Mononuclears.....	3.2	3.1	3.2
Eosinophils.....	0.4	0.1	0.2
Basophils.....	0.1		0

seldom below 10 years of age. The presence of cardiac dysfunction to the point of dyspnea is recognized as a contraindication. Varicosity central to the point of injection serves as a contraindication or a possibility of slow entrance of the drug into the general circulation after injection is duly noted. Manipulations disturbing pharyngeal and laryngeal reflexes preclude the advisability of employment of this drug, unless other indications for it are real and adequate. In such a

16. Wilcox, Frederick C., and Tovell, Ralph M.: Anesthesia in Relation to Diabetes, *Anesth. & Analg.* 18: 94-101 (March-April) 1939.
17. Lundy, John S.; Tuohy, E. B.; Adams, R. Charles, and Mousel, L. H., to be published.

18. Garofalo, Mario: The Present Status of Pentothal Sodium as an Anesthetic Agent, *J. Connecticut M. Soc.* 2: 550-557 (Nov.) 1938.

condition, preliminary topical anesthesia of the affected mucous membrane is to be established. A definite deviation from normal in the oxygen-carrying capacity of the blood indicates caution in its application, as for example in the presence of severe anemias. It would not seem wise to employ it in the face of gross hepatic damage, although we found in one instance that the icterus index and bromsulphalein test were unaffected by a forty-minute administration for an intra-abdominal visualization in the presence of massive cancer of the liver.

UNDESIRABLE EFFECTS AND THEIR MANAGEMENT

Sloughing of tissue and irritation at the site of injection may be prevented by the injection of a 2.5 per cent instead of a 5.0 per cent solution. Respiratory depression is rarely a problem with careful and experienced administration but, when present, is best managed by inhalation or inflation of oxygen. Muscular tremors may be annoying, but slow administration usually overcomes them. If not, resort should be made to another agent. Postanesthetic headaches are rare. The fall in blood pressure is minimal. Postanesthetic nausea and vomiting are also rare.

APPLICATION

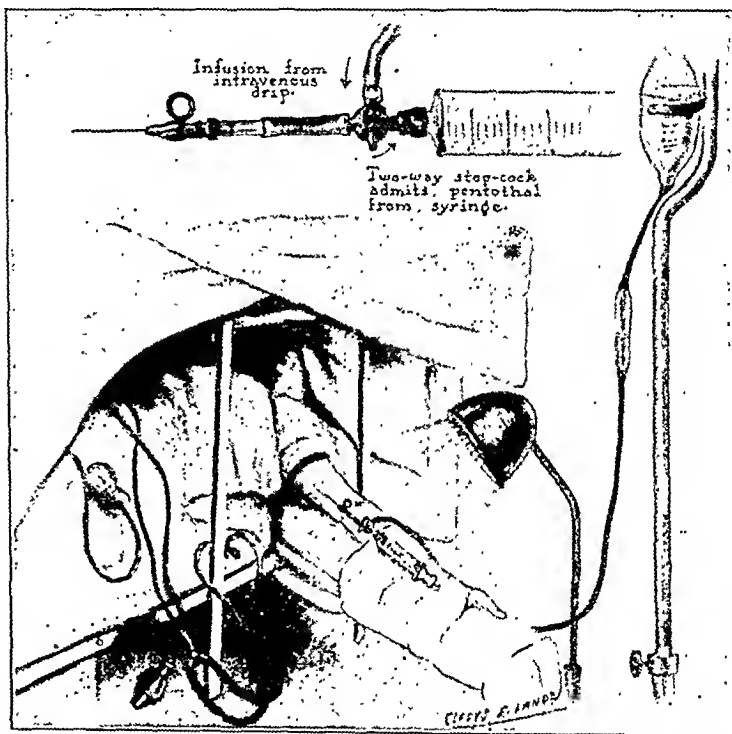
We feel that pentothal sodium is a valuable drug for operations of short or moderate duration, when extensive muscular relaxation, particularly abdominal, is not required and when there is no interference with respiratory function and laryngeal or pharyngeal reflexes. Its use in our hands is adequately shown in tables 2 and 3.

In addition, we would call attention to its value in our hands in certain supplementary capacities. The first of these is indicated during the operative period under regional or spinal anesthesia, when such is prolonged. Here occasionally the patient may become somewhat uncomfortable as the result of the operative position. This condition is further complicated by a progressive diminution in the effects of the preanesthetic sedation. Here we have found it quite advantageous to administer intermittently minimal amounts, just short of the establishment of unconsciousness. By this means the patient is rendered relaxed and calm and there is a reestablishment of the effects of the original preanesthetic sedation.

Anesthetists are rarely called on today to anesthetize patients suffering from toxic hyperthyroidism who have not been controlled medically before operation. Nevertheless, instances occasionally occur in which preoperative treatment in this condition is of decreased value and it becomes essential to anesthetize these patients with a minimum of preanesthetic disturbance. In such a situation it has been our custom to visit the patient in his room and to state that a blood test is to be performed. After venous puncture, the unsuspecting patient is put to sleep with just sufficient pentothal sodium to enable his removal to the cart. Anesthesia is then continued by inhalation methods. By such means we have been able to remove the patient to the operating room and have the operation started without any evidence of increase in the toxic manifestations of the patient's

disease. Pentobarbital sodium may be used as an alternative agent for this purpose. From 3 to $4\frac{1}{2}$ grains (0.2 to 0.3 Gm.) administered intravenously will usually suffice.¹⁹

The results in thirty-four major intracranial procedures were gratifying. Its application in this respect was initiated by a report that intracranial pressure is not raised by its use²⁰ and by the freedom from hazard of fire and explosion that is provided. Infiltration anesthesia is performed, and pentothal sodium is administered only when the patient becomes tired or restless. Initially, it is injected in similar fashion as described for prolonged operations under regional anesthesia. In several instances it was not necessary at any time to produce complete unconsciousness. This method appeals to us because of its greater controllability as compared to rectal instillations of other agents. The simple apparatus for this purpose is shown in the



Apparatus for continuous intravenous drip between administrations of pentothal sodium.

accompanying illustration. The continuous intravenous drip flows between administrations of pentothal sodium at any desired speed and prevents clotting in the needle. The operating time varied up to five hours and fifteen minutes, with an average time of two hours and forty minutes. The largest single dose was 3.15 Gm., with an average dose of 0.95 Gm. From both surgical and anesthetic points of view we see reason to continue its use in such manner for major intracranial surgery but should state that this portion of the series is too small to be conclusive. It should also be emphasized that its application in this respect was managed only by a highly organized group.

ELECTROCARDIOGRAPHIC AND BLOOD STUDIES

An investigation into possible blood changes was carried out by having tests, the results of which are shown in table 4, performed on the day of, but before

¹⁹ Adams, R. Charles: Personal communication to the authors.

²⁰ Horsley, J. S.: The Intracranial Pressure During Barbitol Narcosis. *Lancet* 1: 141-143 (Jan. 16) 1937.

the administration of, pentothal, immediately following the conclusion of the operation, and in the morning of the first day following its administration. These were completed on twenty-five consecutive unselected patients.²¹ A slight but evidently insignificant rise in the content of dextrose in the blood may be noted immediately following the anesthesia, with a decrease to the preoperative level the next day. Five patients, however, showed a slight immediate decrease. The apparent average rise in blood urea was, to a large extent, accounted for by one patient who exhibited an abnormally high preoperative reading with subsequent additional rise. No changes of any significance were shown in the remainder of the tests performed.

The control of the level of blood sugar is easier than is the control of vomiting which may occur after the administration of other anesthetic agents by inhalation. Since vomiting may lead to the establishment of a diabetic acidosis, it is important to be able to control this untoward reaction by employing pentothal sodium. Patients over 40 years of age may have an associated diabetes and marked cardiovascular disease. It is to members of this group that pentothal sodium must be given with extreme caution.²²

Starr²³ reports that the electrocardiograms taken before, during and after pentothal sodium anesthesia at Hartford Hospital have been examined by him. He states that all the grams were normal and remained normal throughout the experiments. The rates showed only slight change. The PR intervals were not affected. The amplitude, contour and direction of the QRS complexes and T waves showed only slight, inconsequential variations during the test.

SUMMARY

The contraindications to the administration of pentothal sodium are specific. Patients should be carefully selected. Special care should be taken to maintain an efficient airway and one should always be prepared to administer oxygen by inhalation or by insufflation if necessary. The maximal dose of 1 Gm. needs seldom be exceeded. This potent drug should be administered by an anesthetist competent to control all situations that are likely to occur during the administration of any general anesthetic agent. The drug has produced satisfactory results in our hands. No postoperative pulmonary complications were encountered and no operative fatalities occurred. In view of its apparent effectiveness and safety, its growing popularity is warranted and further exploration for possible application among the groups of patients now receiving inflammable anesthetic agents by inhalation seems justified.

ABSTRACT OF DISCUSSION

DR. GEORGE J. THOMAS, Pittsburgh: My experience with pentothal sodium has been very satisfactory, especially the results of electrocardiographic study. At first an electrocardiographic study was made of patients receiving pentothal sodium and carried in the upper surgical plane of anesthesia. The result of these cases showed no change on the myocardium or the conductive system of the heart. Being encouraged by these results I proceeded to study this agent under unusual conditions. For subjects my associates and I took patients with normal

electrocardiograms and gave them a large dose of pentothal sodium. Electrocardiographic study while under this toxic dose showed no change. Five days later electrocardiographic study of the patients showed no latent after-effects. A patient was admitted to the hospital for an operation. He had a coronary attack two years prior to admission. An electrocardiogram showed evidence of bundle branch block due to infarction in the ventricular septum. Numerous premature beats were present. During and after anesthesia, tracings showed no deleterious effect. In fact, following anesthesia the rhythm became regular and the premature beats disappeared. Therefore I feel that the more serious a cardiac condition in a case in which operation is necessary, the more indication there is for pentothal sodium. Preanesthetic medication is an important procedure for a satisfactory intravenous narcosis. I would emphasize the use of the opiates, atropine or scopolamine. We have used pentothal sodium to stop the annoying convulsions that occur under ether anesthesia. As a rule, 2 cc. of 5 per cent solution will stop these convulsions in children. We have used pentothal sodium from five minutes to three hours and fifteen minutes, from 5 years to 85 years of age, from 3 to 69 grains (0.2 to 4 Gm.) in a series of 3,100 cases in the past two and one-half years. We have had no pulmonary complications or death attributed to this type of anesthetic. I agree with the authors regarding the intermittent technic. At St. Francis Hospital we have made this possible and convenient by means of a simple apparatus. For short operations we use the single syringe and a three way stopcock. When the solution in the syringe is depleted we are able to refill the syringe by means of this stopcock. In operations consuming longer than twenty-five or thirty minutes the cannula of the needle frequently becomes clogged with blood clot. Because of this complication we use a manifold to which we attach an ordinary intravenous needle. This makes it possible for us to administer salt solution and pentothal sodium through the same needle.

DR. RALPH KNIGHT, Minneapolis: I quite agree about the danger of muscular spasms of the pharynx and larynx during pentothal anesthesia. At the University of Minnesota we have a good many cases of malignant disease in the region of the mouth and throat. The surgeons constantly asked for pentothal anesthesia for biopsy and often even for destruction of the lesions. Gas anesthesia was impracticable, the contemplated procedure usually seemed too minor to warrant ether anesthesia, and cautery destruction was usually planned. Under pentothal anesthesia, even in the second or third plane of the third stage, in many cases severe spasms of the tongue, pharynx and larynx occurred as soon as the surgical procedure was started, causing respiratory obstruction. Under pentothal sodium, respiratory effort ceases promptly after the occurrence of obstruction. Resuscitative measures were too frequently called for and were sometimes difficult. Often too the surgery proved to be more major than anticipated and it became still more of a problem to maintain an open airway and satisfactory anesthesia. To obviate these difficulties I attempted transnasal blind intubation of the trachea and was surprised to find that it was not difficult under pentothal anesthesia. For a case of carcinoma of the nose I attempted transoral intubation and found it not difficult although it required much deeper pentothal anesthesia than the transnasal method. The first injection of the pentothal sodium must be more rapid than usual to obtain quick throat relaxation; then the injection must be continued, entirely under the direction of the one who is inserting the tube, until the arytenoids and cords relax and the tube can be inserted. This takes not over two minutes as compared with ten to fifteen minutes with gas and ether. As soon as the tube enters the trachea, respiration is usually stimulated. One has complete control, and even should respiration be somewhat overdepressed a few ventilations with oxygen from the machine will restore it to normal. Pentothal sodium with intratracheal oxygen proved to be the ideal anesthetic for these head cases and with this experience we adopted pentothal induction as the routine for introduction of intratracheal tubes whenever they are indicated for any type of surgery, regardless of the anesthetic selected for maintenance. We have now inserted almost 150 intratracheal tubes under pentothal anesthesia.

21. From the Clinical Laboratories of the Hahnemann Medical College and Hospital.

22. Patterson, Robert L.: Case Reports of Fatalities Following Intravenous Anesthesia, Proc. Am. Soc. Anesth., Inc., Feb. 10, 1939. Wilcox.¹⁵

23. Starr, Robert S.: Personal communication to the authors.

CLINICAL EXPERIMENTS WITH
ANDROGENSIV. A METHOD OF IMPLANTATION OF
CRYSTALLINE TESTOSTERONESAMUEL A. VEST, M.D.
CHARLOTTESVILLE, VA.AND
JOHN E. HOWARD, M.D.
BALTIMORE

From experimental observations it is well known that androgenic substances are chemically changed and excreted after entering the circulation. The effectiveness of any androgenic preparation depends on many factors. One of the most important, besides the frequency of administration and the dosage, is the method of administration. The use of various solvents, the addition of fatty acids to the androgenic solutions, esterification of the substances and many other variations have been studied in an attempt to increase the efficiency of administration of androgenic substances. The fact that pure crystalline testosterone is readily absorbed by the body fluids undoubtedly leads to waste when excess material is given. In order to overcome this difficulty and to decrease the rate of absorption, testosterone has usually been injected in an oily solution as the propionate. Injection of testosterone propionate has proved far more effective than the equivalent amounts of free testosterone. The intensity and duration of the action of testosterone has been thus enhanced, and treatment of hypogonadism in human beings has been satisfactorily carried out with injections at intervals of from three to four days.¹ From the results of animal experiments it would appear that when large amounts of testosterone propionate are injected at such intervals an appreciable proportion of the substance is wasted. Testosterone has also been used clinically in the form of innuncions and by oral administration. It is not entirely satisfactory in the form of innuncions and when given by mouth enormous amounts are necessary to elicit clinical response. A method of administration which would tend to simulate the secretion of this hormone by the testis has been sought. If androgenic substance can be administered so that the amount absorbed daily is not in excess of the physiologic requirements, waste will be eliminated and expense can be kept to a minimum. Before the prevalent intramuscular injection of the testosterone propionate in an oily solution is supplanted, a new method must prove to be more convenient, more efficient, less expensive and devoid of harmful consequences.

The first use of pure androgens and estrogens by subcutaneous implantation of crystals or pellets was reported by Deanesly and Parkes² in 1937 and 1938. Their work indicated that tablets of compressed crys-

tals implanted subcutaneously produced stronger and longer effects of stimulation than similar doses given by injection. Schoeller and Gehrke³ later showed the superior effect of implanted testosterone and testosterone propionate tablets in fowls. Having knowledge at the time of the work that Deanesly was carrying out in experimental animals, we first implanted pellets of crystalline testosterone subcutaneously into a patient with hypogonadism in the fall of 1937, but these pellets were too small to produce any significant clinical results. Three recent reports⁴ have referred to the

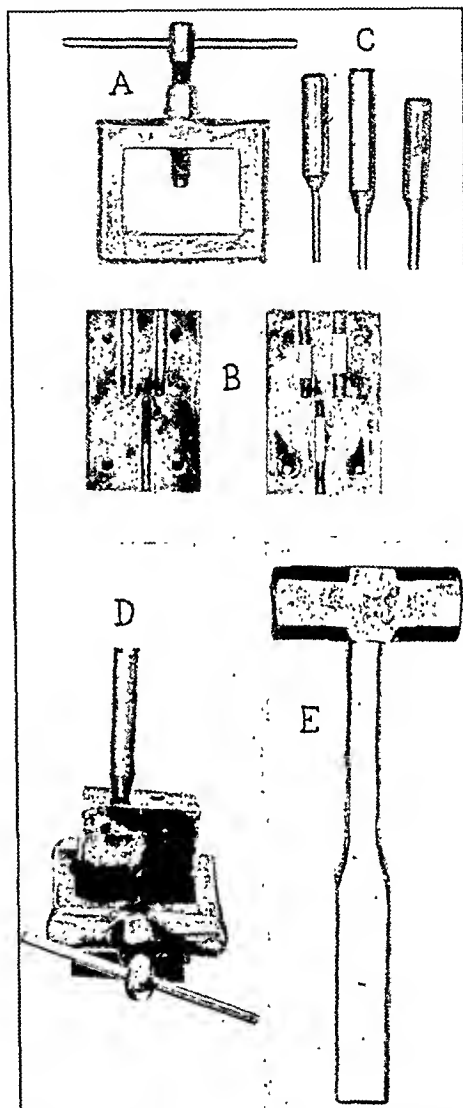


Fig. 1.—The instruments used to make pellets of various sizes. A, the press; B, the die with three sizes of pellets; C, the punches; D, the assembled press with a punch in place; E, the heavy metal mallet.

From the James Buchanan Brady Urological Institute and the Department of Medicine of the Johns Hopkins University and Hospital.

This work has been aided by a grant from the Ciba Pharmaceutical Products, Inc., which also supplied the testosterone, and by a fellowship from the Lalor Foundation.

This method was presented in brief in a discussion before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Vest, S. A., and Howard, J. E.: Clinical Experiments with the Use of Male Sex Hormones: Use of Testosterone Propionate in Hypogonadism, *J. Urol.* **40**:154-183 (July) 1938. Howard and Vest.⁶

2. Deanesly, Ruth, and Parkes, A. S.: Factors Influencing Effectiveness of Administered Hormones, *Proc. Roy. Soc., London*, s. B **124**: 279-298 (Dec. 7) 1937; Biological Properties of Some New Derivatives of Testosterone, *Biochem. J.* **31**:1161-1164 (July) 1937; Further Experiments on Administration of Hormones by Subcutaneous Implantation of Tablets, *Lancet* **2**: 606-608 (Sept. 10) 1938. Deanesly, Ruth: Use of Castrated Mice for Testing Androgenic Substances, *Quart. J. Pharm. & Pharmacol.* **11**: 79-83 (Jan.-March) 1938.

implantation of small pellets of testosterone in human beings with questionable results. In the fall of 1938, soon after Thorn⁵ began his work with the implanta-

3. Schoeller, W., and Gehrke, M.: *Versuche über die Wirkung männlicher Hormone bei Kapaunen*, *Klin. Wchnschr.* **17**: 694.

4. Lippross, O.: Ergebnisse der Behandlung männlicher Keimdrüsenhormonen, München, med. Wchnschr. **85**:1668-1672 (Oct. 28) 1938.

Foss, G. L.: Clinical Administration of Androgens: Comparison of Various Methods, *Lancet* **1**: 502-504 (March 4) 1939. Hamilton, J. B., and Dorfman, R. I.: Influence of the Vehicle upon the Length and Strength of the Action of Male Hormone Substance Testosterone Propionate, *Endocrinology* **24**: 711-719 (May) 1939.

5. Thorn, G. W., Engel, L. L., and Eisenberg, Harry: Treatment of Adrenal Insufficiency by Means of Subcutaneous Implants of Pellets of Desoxy-Corticosterone Acetate (A Synthetic Adrenal Cortical Hormone), *Bull. Johns Hopkins Hosp.* **64**: 155 (March) 1939.

tion of moderate sized pellets of desoxycorticosterone acetate, we began to make and implant pure testosterone in large pellets weighing up to 800 mg. We have now implanted these pellets into a series of thirteen patients with hypogonadism.⁶ We have implanted pellets subcutaneously or intramuscularly in the leg, arm, back

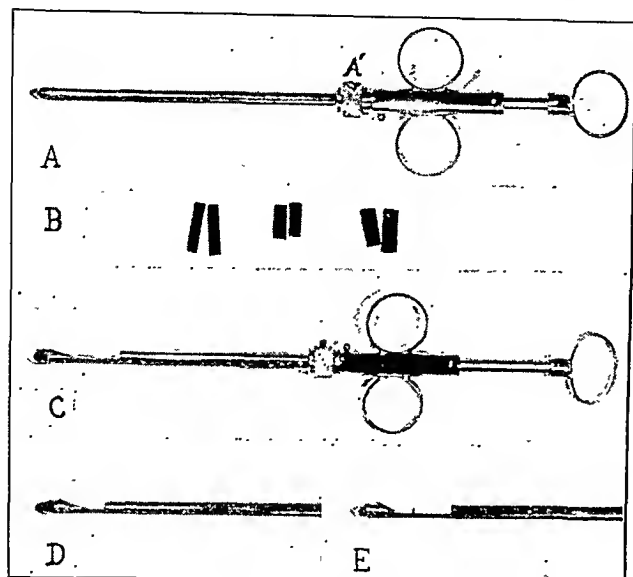


Fig. 2.—A, the "injector" instrument with fenestra closed; A', the mechanism to open and close fenestra at will; B, three sizes of pellets; C, instrument with fenestra opened by rotating handle (note the blade-like point); D, end of injector showing obturator extruding a pellet; E, same as D but with two pellets being extruded.

and scrotum. The pellets have been removed later and reweighed in order to calculate the average amount that has been absorbed daily. The actual curve of absorption probably shows a gradual decrease as the size of the pellet becomes smaller. Tissues surrounding the pellets, which are foreign bodies, have been removed and studied pathologically. Assays of the urinary androgens and estrogens have been made before and after implantation. A systematic study of various aspects of pellet implantation with both crystalline testosterone and some of its esters is now being completed and an evaluation of the clinical results will be discussed in a forthcoming report.⁷ A study of the effects of testosterone and its esters in the monkey, comparing the method of injection with the implantation of pellets, is also in progress.⁸

Our purpose in this report is to present a new technic for the subcutaneous implantation of solids such as pellets of pure crystalline androgenic substance by the use of an "injector" instrument.⁹

If the slow absorption of subcutaneous androgenic substance in pellet form was to be more efficient per unit weight of material utilized, this advantage would be offset somewhat by the impracticability of the necessary incision for implantation. To obviate an operating room procedure, the following method was devised. Figure 1 A, B and C shows the press, die and punches used to make pellets of three different sizes. The pellets are shown in their corresponding slots. Figure 1 D

shows the assembled press with a punch in place. Figure 1 E shows the heavy metal hammer used to pound the previously sterilized, powdered testosterone into a very hard and compact pellet. These implements can be boiled and the pellets are made under sterile technic. It has been impossible to make pellets of uniform size and weight with such an apparatus, but for practical purposes it has served for our study. Many factors probably affect the absorption rate, the foremost of which are the surface area and the density of the pellet. Other possible factors are the vascularity of the site of implantation, the extent of the reaction to the foreign body and the degree of hormone deficiency. For absolute comparative values regarding absorption and clinical effect in a series of cases it would have been ideal to implant pellets of identical size and weight, but this was not possible.

Figure 2 A shows one of several instruments which we have devised on the principle of the syringe in order that solid pellets might be injected subcutaneously or intramuscularly in the office instead of in an oper-

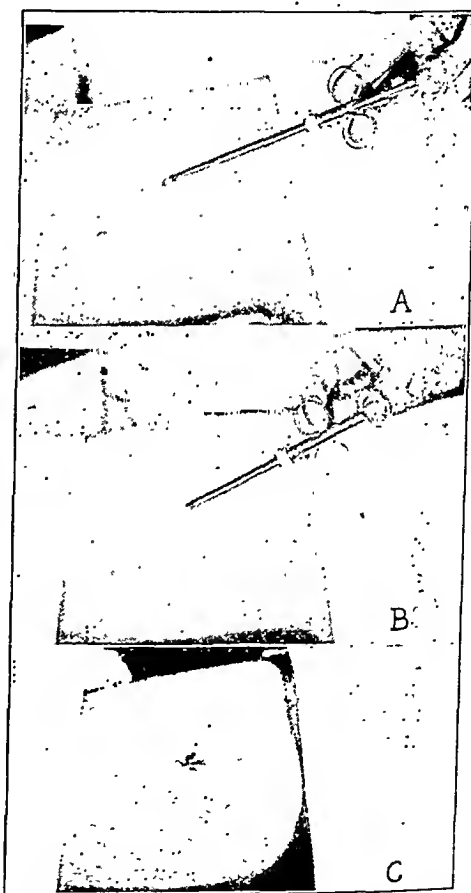


Fig. 3.—Method of depositing pellet by means of a new "injector" instrument. A, instrument entering skin of leg through a wheel of local anesthetic; B, end of instrument below fascia lata with obturator being pushed forward to extrude and deposit pellet (the fenestra has been opened by rotating window); C, skin clip to close puncture wound.

ating room. It shows the instrument with the fenestra closed and the obturator slightly withdrawn. A scalpel-like point serves to pierce the skin, leaving a clean linear opening. Figure 2 B shows pellets of different caliber for which three sizes of instruments can be used, depending on the amount of material one desires to inject. The maximum amount injected with such

6. Howard, J. E., and Vest, S. A.: Clinical Experiments with the Use of Male Sex Hormones, *Am. J. M. Sc.*, to be published.

7. Howard, J. E., and Vest, S. A., to be published.

8. Vest, S. A., Drew, Edwin, and Howard, J. E., to be published.

9. This instrument was developed with the assistance of Mr. Frederick C. Wappler, of the American Cystoscope Makers, Inc.

an instrument to date is two pellets of more than 400 mg. each at one time. Figure 2C shows the instrument with the fenestra open and the obturator withdrawn. Figure 2D shows the end of the "injector" or "implanter" with the fenestra open through which the obturator is extruding a pellet. Figure 2E shows how

because the margins of the skin of the 6 to 8 mm. puncture wound usually approximate themselves.

The following two cases are reported as examples of the clinical activity of testosterone when it is implanted into man in the form of pure crystalline pellets of large size:

CASE 1.—History.—W. A., a white youth aged 21, admitted to the James Buchanan Brady Urological Institute March 21, 1939, complained of having "never matured sexually." His two brothers developed normally. The usual changes of puberty, with the exception of the appearance of a few pubic hairs at the age of 15 to 16, did not occur in the patient. He stopped school in the eleventh grade because of his underdevelopment. His psychologic content was definitely male. Erections had occurred frequently in the mornings since the age of 17, and he masturbated several times a year but without ejaculation.

Examination.—Figure 4A shows the typical eunuchoid appearance. The patient was 5 feet 10½ inches (149 cm.) tall and weighed 142¾ pounds (64.8 Kg.). Roentgenograms showed a normal skull and sella, but there was retardation in the epiphyseal closure of the bones. There was more than 25 but less than 50 rat units of follicle stimulating factor per liter of

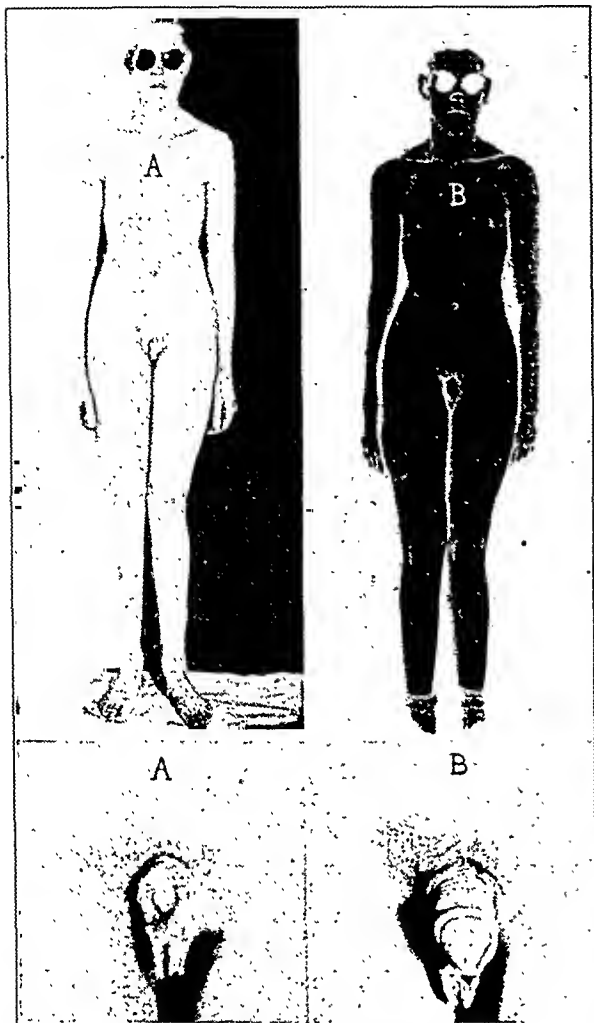


Fig. 4 (case 1).—Appearance of patient, aged 21, with hypogonadism before and after implantation of pellets of crystalline testosterone in muscle of back. A, full view and genitalia before implantation; B, same ninety days later.

two pellets can be injected, one following the other. The obturator can be entirely withdrawn and the pellets inserted into the proximal end of the barrel as desired instead of through the open fenestra. The fenestra can be opened and closed at will by means of the rotary barrel mechanism controlled at the handle.

The instrument is used in the following manner, as shown in figure 3. A wheal is made in the skin of the thigh with a solution of nupercaine. The instrument with the pellets of testosterone inside and the fenestra closed is pushed painlessly through the skin and, if desired, beneath the fascia lata (fig. 3A). In figure 3B the fenestra has been opened and the obturator is being pushed forward to extrude the pellets in the muscle of the thigh. The fenestra is then closed and the instrument is withdrawn, leaving the pellet in place as shown in fig. 3C. A silver clip has been used to close the puncture wound. A clip is not always necessary

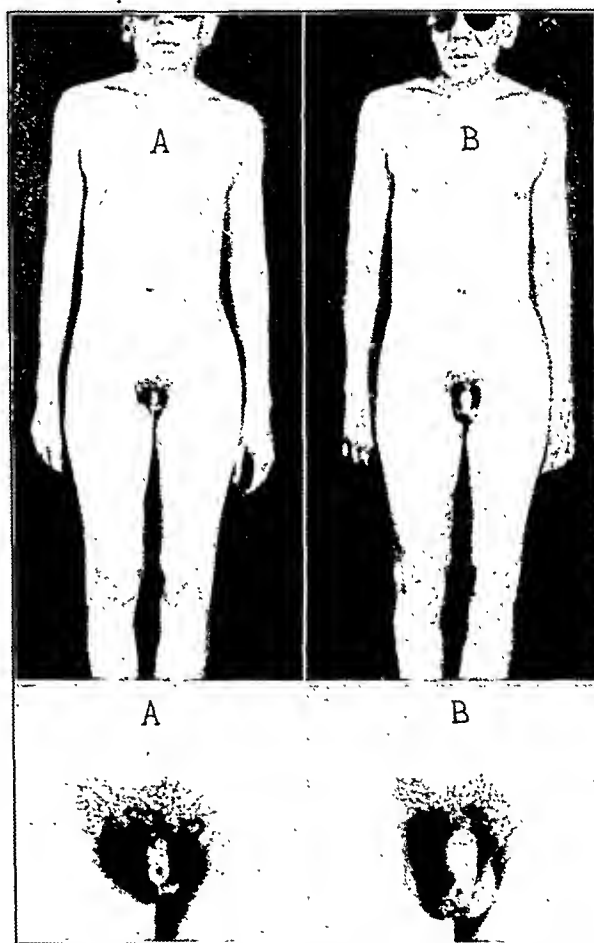


Fig. 5 (case 2).—Appearance of patient, aged 34, with hypogonadism before and after implantation of large pellet of testosterone weighing 750 mg. into scrotum. In some respects this could be termed a "synthetic testicle." A, full view and genitalia before implantation; B, same two and one-half months later. Slower absorption of large pellet in scrotum was taking place as compared to case 1.

urine. No hair was present on the face, extremities, abdomen or chest. The breasts were normal. The voice was high pitched. The penis was infantile (fig. 4A) and only 5 cm. long on complete extension. The testicles were about 4 to 5 mm. in diameter and were situated in the scrotum. The outlines of the prostate and seminal vesicles were impalpable. No secretion was expressed by massage of the prostatic region.

Treatment.—March 25 three pellets of crystalline testosterone weighing 277, 219 and 175 mg. were implanted in the right lumbar muscles. (In this case we used three relatively small pellets instead of one or two large ones because we wished to study the absorption rate of pellets of this size compared with the larger ones.)

Result.—The second day after implantation the patient began to notice an increased frequency of erections and he masturbated eight times in the subsequent three months. Ejaculation occurred for the first time in his life. The nipples soon became tender with the appearance of small lumps underneath, more marked on the left. At the end of the first month the voice began to

have found in other patients who received a single large pellet. The patient is now continuing to develop with a single pellet weighing 778 mg.

CASE 2.—History.—J. R., a man aged 34, entered the James Buchanan Brady Urological Institute April 1, 1939. His brothers were normally developed. At the age of 15 the patient had his present degree of pubescence. Since then he had had an occasional erection, with rare masturbation without ejaculation.

Examination.—The patient presented a eunuchoid appearance. Figure 5A shows the patient before treatment. He was 5 feet 5¾ inches (167 cm.) tall. A roentgenogram showed delayed union of the epiphyses with the skeletal age of a youth 18 years old. There was present 25 rat units of follicle stimulating factor per liter. The genitalia were undeveloped (fig. 5A). The penis was 4.5 cm. long on complete extension. The testes were 1 cm. long and were situated in the upper part of the scrotum. Considerable pubic, rectal and perineal hair was present. No hair was present on the chin, body or extremities. A tiny amount of prostatic tissue could be felt around the urethra. The seminal vesicles were indefinite. No secretion could be expressed by massage.

Treatment.—April 10 a pellet of pure testosterone weighing 750 mg. was implanted into the scrotum. The scrotum was selected because of its superficial position where the pellet could easily be palpated from time to time. It is possible that absorption from the scrotum is slower and not as satisfactory as from muscle or subcutaneous tissue.

Result.—Figure 5B shows the patient's appearance two and one-half months after implantation, at which time it seemed by palpation that only about one third of the pellet had been absorbed. During this time he complained of erections practically all night and frequently during the day. The testes descended to the bottom of the scrotum so that the left came to lie just adjacent to the pellet. The voice became deeper. He gained 4 pounds (1,814 Gm.) the first two weeks and 3 pounds (1,307 Gm.) the following two weeks. He began to masturbate three or four times a week, with ejaculation. Slight tenderness appeared in both breasts, especially the left. Hair began to grow on the lower legs and the upper lip. In two and one-half months (fig. 5B) the penis had increased in size and was now 6.3 cm. in complete extension. The prostate had developed to about two thirds normal size. It was normal in contour, shape and consistency. Several drops of secretion could be expressed which were normal in appearance and normal microscopically. The seminal vesicles were easily palpable and almost normal in size.

The clinical results, though just beginning in these patients, is indicative of the activity of crystalline testosterone when implanted subcutaneously in the form of pellets. The method may prove to have important clinical applications, but more extensive work is necessary to establish this with certainty.

It has been of interest to study the type of tissue reactions which occur around pellets of testosterone. Figure 6A and B shows photomicrographs of the tissue encapsulating pellets four months after implantation. In figure 6A the cavity in which the pellet was situated is visible. Surrounding this cavity is granulation tissue containing many foreign-body giant cells, an occasional leukocyte and some round cells, all lying in a fibroblastic matrix. In 6B (another case) there is less reaction to the foreign body, with only a rare giant cell. Much fibrous scar tissue has developed, some of which is hyaline. A dense collection and some diffuse round cells are seen. There is no evidence of unusual cellular reaction, metaplasia or carcinogenic activity.

It is possible that such an instrument as we have developed and presented here might be applicable to injection of other solid medicinal materials.

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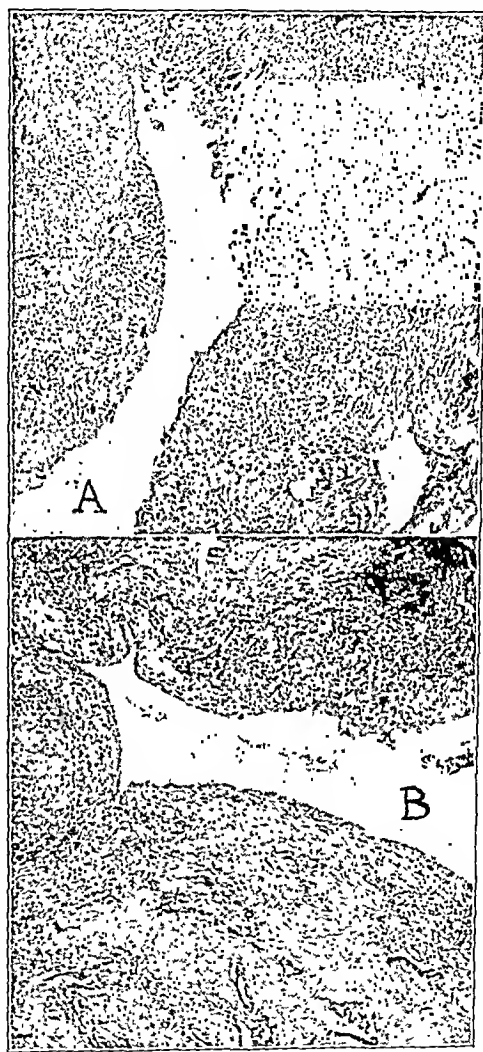


fig. 6.—Sections of tissue showing reaction around cavities where pellets had been placed for three months in the subcutaneous tissue of arms of two patients. A, many giant cells with some round cells and leukocytes; B, fibrous tissue, some of which is hyaline, and a dense collection of round cells.

crack and assume a lower pitch. At the end of three months (June 23) a distinct increase of pubic hair had occurred, together with the appearance of profuse, thin, short hairs on the lower legs. The scrotum became larger and darker. The prostate was then three fourths of the normal adult size and of normal consistency and contour. The seminal vesicles were, however, barely palpable. Normal prostatic secretion was expressed. The penis increased in diameter and when completely extended measured 8.5 cm. Figure 4B shows the patient's appearance June 23, ninety days after the pellet implantation. During this period he absorbed the three pellets completely, an average of at least 6.9 mg. a day. Pellets of this size absorb rapidly; his absorption rate was approximately twice that of what we

THE PROTECTION OF CHILDREN
FROM TUBERCULOUS ADULTS

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NEW ROCHELLE, N. Y.

There is a definite hazard to the health of children from intimate association with persons about whom little or nothing is known with regard to freedom from tuberculosis or other communicable conditions. Since parents are much more apt to have had adequate medical supervision than the servants in a home, the risk to children from the latter is greater. Occasionally an older member of a family, mistakenly thought to have "chronic bronchitis" or "asthma," is a factor to be considered in safeguarding a child from tuberculosis. School teachers with active tuberculosis are a menace to their pupils.

The New York Tuberculosis Association in 1922, through the instigation of Dr. Charles Hendee Smith, made a study of the subject of protecting children from tuberculous servants.¹ It was stated that "every stranger who comes into our household carries an insidious threat against our nearest and dearest, the children," and "it is high time to combat this very real danger." It was concluded that all persons in contact with children should undergo periodic medical examinations.

It is unnecessary to detail the several instances among my patients in which a primary tuberculous infection was acquired from a servant or other member of the household. Every physician with experience in the care of children knows of instances in his own practice of primary tuberculosis from exposure to tuberculous adults in the home. With a few of my own child patients infected in this way the outcome was tragic. In others the tuberculin reaction was positive without clinical evidence of pulmonary lesions during childhood.

A large number of children in whom the tuberculin reaction was positive before 7 years of age were followed for 11 years by Ch'ui, Myers and Stewart.² Nine times more of these children developed the reinfection type of disease than did those of a control group in whom the tuberculin test was negative at the same age. This is conclusive evidence of the potential danger to the future health of a child when the tuberculous infection is acquired early. It shows that a positive tuberculin reaction in childhood is undesirable and may be a more serious matter than a positive Wassermann reaction.

The fact is, practically all childhood tuberculosis is contracted from association with adults who have the disease in an open form. I agree emphatically with Dietrich³ that to prevent the contact of tuberculous persons with children is as worthy a project as was that to eliminate tuberculous dairy cattle from the production of milk. By proper foresight and appropriate action this can be done.

At the time when C. H. Smith¹ made the attempt to attack the problem of the tuberculous servant he encountered many difficulties which are still present,

although possibly to a less degree. The public is now more fully aware than in the past of the danger to children from contact with open tuberculosis. This and the campaign of education regarding syphilis have made parents willing and anxious to keep diseases of a communicable nature out of their homes and away from their children.

Prevention of contact between children and tuberculous nursemaids or other domestic helpers will be less frequent when parents are so convinced of the necessity of employing only healthy servants that they will demand proof of their servants' health. Too frequently a great deal of resistance has to be broken down and prejudices overcome before servants can be induced to submit to this procedure. Domestic helpers having to do with the care of young children must be persuaded that it is to their advantage to have periodic medical examinations so that they will secure them as a matter of course. When "health references" are universally asked for and a health card is essential to get a job, a great step forward will have been made. Physicians interested in child health should influence their patients to take this wise precaution for the sake of the children.

The danger to children from a tuberculous school teacher is illustrated dramatically by the case of a teacher in Minnesota reported by the Jordans.⁴ This teacher, with unrecognized far advanced tuberculosis, in addition to teaching chemistry instructed the band and orchestra. Often he would blow into a child's instrument, showing him how to execute a difficult passage. The child then returned it to his own lips, with a definite sputum transfer. It was found that 33½ per cent of the boys of the band reacted positively to the Mantoux test while the pupils of the school as a whole were 15.72 per cent positive, a 100 per cent greater incidence among his pupils.

The teachers and janitors in this school were 49 per cent positive to the Mantoux test. Five of the 173 examined had reinfection adult type pulmonary tuberculosis.

In a tuberculosis survey in Macon County, Ill.,⁵ of 705 school teachers given x-ray examinations 315 were found to be infected and nine were actively tuberculous. Lindberg concludes with the statement that "while the school teacher has not more tuberculosis than the average adult, next to the family she provides the greatest opportunity for close prolonged contact with the school child. To require the teacher to provide a health certificate, including chest films, would serve to remove this reservoir of infection."

As a result of tuberculin tests and x-ray examinations of more than 6,066 school teachers in a survey in several parts of the country, 2.15 per cent were found to have tuberculosis in a stage requiring treatment. On this basis Lees⁶ concludes that among the 871,607 teachers in our elementary and secondary schools 18,739 tuberculous teachers were in active service in 1936. This statement was confirmed by Myers.⁷

L. S. Jordan⁸ maintains that the prevention of infection is the primary step in the control of tuberculosis.

Read before the region I meeting of the American Academy of Pediatrics, New York, June 1, 1939.

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2. Ch'ui, P. T. Y.; Myers, J. A., and Stewart, C. A.: The Fate of Children with Primary Tuberculosis, *J. A. M. A.* 112:1306 (April 8) 1939.

3. Dietrich, Henry: Tuberculosis in Infancy and Childhood, *Arch. Pediat.* 42:197 (March) 1930.

4. Jordan, L. S., and Jordan, K. B.: *Minnesota Med.* 16:555 (Sept.) 1933.

5. Lindberg, D. O. N.: The School Teacher as a Source of Tuberculosis Infection, *Illinois M. J.* 68:350 (Oct.) 1935.

6. Lees, H. D.: Tuberculosis Among Teachers, *Bull. Nat. Tuberc. A.*, June 1936.

7. Myers, J. A.: Educators and Tuberculosis, *J. Nat. Educ. A.*, January 1939.

8. Jordan, L. S.: The Teacher, *Journal Lancet* 56:187 (April) 1936.

"Find the source" was his slogan. He found the sputum positive in eight of 786 teachers tested. He reported further that of sixty-four pupils exposed to a teacher with far advanced pulmonary tuberculosis 42.6 per cent were positive to the Mantoux test, while of 161 other pupils of the same school and age group 11.2 per cent were positive. This is definite evidence of the increased incidence of infection resulting from contact with a teacher having open tuberculosis.

The approach, methods employed and results of a tuberculosis survey of teachers and janitors in the schools of Minneapolis sets an example which can well be followed by any community which has not already established a satisfactory system of its own. This is described by Harrington, Myers and Levine⁹ in reporting the examination of 3,600 Minneapolis school employees. Sixty-eight showed x-ray evidence of disease necessitating further observation. Six were found to have tubercle bacilli in their sputum.

In 1930 Dietrich⁸ reported three families in which four children developed tuberculosis (two of them died) following contact in their homes with tuberculous nursemaids. He also told of a kindergarten teacher with active pulmonary phthisis whose association with her 5 year old pupils resulted in the primary tuberculous infection of several of them. Dietrich found at that time that there were laws in five states requiring teachers to be free from tuberculosis and no laws in respect to the health of nursemaids and governesses. He recommended health examinations for all nursemaids, governesses and kindergarten teachers and issuance of cards to all healthy applicants.

Rogers¹⁰ in 1934 summarized all aspects of the care of teacher health in this country as follows: About two thirds of the largest cities required a certificate of health from teachers before appointment. The smaller the community, the fewer had such a regulation. At that date, in twenty states, examination before employment was required by law. Nowhere was a tuberculin reaction or lung x-ray examination mentioned as a requisite part of the examination. In few, if any places was repetition of examinations at stated intervals part of the health program for teachers. When free medical consultation service was offered, teachers seldom made use of it, probably because of fear that the result of an examination might react to their disadvantage.

One cannot help concluding that, for school teachers to be proved healthy and free from transmissible disease, medical examination must be compulsory and repeated at regular intervals. These examinations should include a tuberculin test and x-ray examination of the lungs and should be made by a physician who is uninfluenced by any personal considerations which might affect his report. In 1934 Philadelphia was the only city with a teacher health program approaching this ideal. Recently New York City has required thorough examination of new teachers with periodic reexamination.

The American Academy of Pediatrics has endorsed the principle of healthy adults in contact with children. A campaign is in progress to bring to the attention of doctors, parents, servants, trained nurses and teachers facts relative to this aspect of child health. Through its

Committee on Contact Infections, with the assistance and cooperation of many child health minded organizations, the program of education is under way. Pediatricians and family physicians can accomplish a great deal by advocating that parents, other members of the family, servants, nursemaids and trained nurses, because of their intimate contact with children, should have periodic health examinations.

County and other medical societies throughout the country are sponsoring a standardized examination designed to detect any contagious condition. The examination will include an x-ray examination of the lungs, at least for all who are tuberculin positive. The examination will be available at a low rate of charge. In most instances the radiologists are cooperating by charging a minimum fee for the chest film.

The American Academy of Pediatrics advocates that examinations be undergone voluntarily, through an appeal to reason, rather than from compulsion. What provision is made for obtaining examinations will depend on the conditions existing in each locality. It is desirable that examinations of all who are employed be made by practicing physicians. In communities where the wage scales of domestics do not permit the payment of a fee sufficient to compensate a doctor for the time required for an adequate examination and for an x-ray examination, the applicants will be examined in clinics for a nominal fee or no charge.

As part of this program for examination of domestic servants in Knoxville, Tenn., Dr. Oliver W. Hill¹¹ reports that, in 1938, 571 persons with syphilis, sixty-seven with active tuberculosis and five typhoid carriers were picked up and put out of circulation.

Finding persons with insufficiently or untreated syphilis is an important feature of this project. It is thought that the benefit from this will be greater to the individual needing treatment than to the children with whom they are associated. The communicability of this disease to children through kissing is possible, though infrequent, when compared with tuberculosis, in which the contagious stage lasts for a much longer period. Smith¹² was able to collect but 125 cases of acquired syphilis in children under 11 years of age.

There can be no question that this program will be advantageous to the health of children by protecting many of them from unnecessary illness. In addition, the individuals examined may have much to gain through the discovery of conditions needing medical attention.

The practicing physician is the person to take the lead by advocating this health protection. The success of the program depends to a great extent on his recommendation. The physician can go even further in setting an example by himself having a physical examination and an x-ray examination of the lungs.

CONCLUSIONS

1. Tuberculosis in children is acquired almost exclusively from contact with infected adults in their homes and in school.
2. School teachers should be proved to be free from communicable tuberculosis. In very few communities in this country is this being done.
3. Domestic servants and nurses should have periodic medical examinations and be required to furnish a "health reference" of freedom from transmissible disease.

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4. Parents, relatives and pediatricians should also be examined at intervals.

5. Cooperation with the program of the American Academy of Pediatrics for healthy adults in contact with children will result in fewer cases of childhood tuberculosis infection.

421 Huguenot Street.

Clinical Notes, Suggestions and New Instruments

RAPID RECOVERY FROM TYPE XIII LOBAR PNEUMONIA TREATED WITH RABBIT SERUM

OF A PATIENT WITH ADDISON'S DISEASE UNDER TREATMENT WITH DESOXYCORTICOSTERONE

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CHICAGO

This report is made to change a conception of prognosis in Addison's disease complicated by infection. Undoubtedly, many physicians have seen patients with Addison's disease survive infections. Usually such subjects are treated as though they were in crisis. This man had been controlled with desoxycorticosterone and had returned to work when seized with lobar pneumonia. He was continued on the same dose of the synthetic hormone plus 5 cc. of adrenal cortex extract¹ daily and made a rapid, complete recovery.

We feel that this result further confirms the efficiency of the substitution therapy with desoxycorticosterone in Addison's disease and that infection should not upset these patients too much, provided a specific treatment is available for the infection.

REPORT OF CASE

A white man of 38, a salesman, entered Henrotin Hospital May 8, 1939, with the complaint of weakness, dizziness, loss of appetite and loss in weight. He had been well until the fall of 1938, when he began to grow weaker and to eat poorly. His symptoms were considerably aggravated by influenza in February 1939, when he was away from work one month because of weakness. Dizziness came on standing up suddenly, on moving about or with exercise. On a few occasions he had fallen. Lying down always put an end to the dizziness. His weight had gone from 148 to 130 pounds (67 to 59 Kg.) on entrance since November 1938. There was a considerable aversion to food, and nausea was frequent this spring. He had not vomited or had severe abdominal pain.

The past history was irrelevant except that he had been sick for a few weeks with pneumonia at the age of 20.

The patient was a slender man, not acutely ill, with considerable brown pigmentation about his head, which was bald, and the neck, arms and sides of the body, especially the lateral aspect of each hip. His strength was fair in the arms and legs.

The blood pressure was found to be 60 systolic, 40 diastolic standing up and 78 systolic, 50 diastolic while sitting up. While lying down the lowest figure was 86 systolic, 56 diastolic. The laboratory work-up showed no abnormality save that the serum sodium was 133 milliequivalents per liter, compared to the normal of 140 or more.

Treatment was started with 10 cc. of adrenal cortex extract and 4 Gm. of salt daily. There was marked subjective improvement. His weight began to increase as his appetite returned. After six days on this treatment he was placed on 5 mg. of desoxycorticosterone subcutaneously each day, on which his weight came up to 138 and his blood pressure stabilized at about 120 systolic, 80 diastolic, and he returned to work.

June 23 he had a slight nasal discharge and fulness in the head. The blood pressure was 114 systolic, 80 diastolic, while standing. Next morning at 2 o'clock he had a chill and vomited twice. On returning to the hospital at 5 a. m. he was acutely ill.

The temperature was 104.4 F., pulse rate 100, respiratory rate 30 and blood pressure 146 systolic, 90 diastolic. The accessory muscles of respiration were in use. There were questionable harsh breath sounds over the left lower lobe posteriorly. He was given 1,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride.

The sputum contained type XIII pneumococci and antiserum was started at 1 p. m., 200,000 units of rabbit serum being given undiluted by 8 p. m. The white count was 7,200, the blood culture negative.

June 25 the peak temperature was 99.4 F., the blood pressure 120 systolic, 72 diastolic. The patient felt well but coughed up a little bright red sputum. He had no more fever but showed dulness and rales over the left lower lobe for two days. An x-ray examination confirmed the diagnosis of lobar pneumonia. Retyping the sputum showed the same organism.

The management of Addison's disease during the pneumonia was 1 Gm. of salt daily, a general diet along with desoxycorticosterone 5 mg. daily subcutaneously, and 5 cc. of adrenal cortex extract for four days. The maintenance dose of 5 mg. of desoxycorticosterone daily is again adequate. The patient returned to general activity June 29.

1853 West Polk Street.

SUMMARY OF SOME CLINICAL STUDIES ON VITAMIN K

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In continuation of the work of Dam and Glavind¹ I have in the past year carried out a series of investigations on patients with diseases in which lowered prothrombin might be expected. The determination of prothrombin was made by the method described by these authors. It was found to work satisfactorily. In fourteen of the cases in which lowered prothrombin (high R-values) were found, the different ways of administering vitamin K were also studied.

Dam and Glavind¹ reported the treatment of five cases of obstructive jaundice with K-avitaminosis by intramuscular injections of an emulsion of vitamin K in water and found it possible to restore the blood coagulation to the normal value within a week.

Since then I have studied the effect of vitamin K when given perorally, intramuscularly and intravenously.

For peroral use gelatin or starch capsules containing the concentrate together with desoxycholic acid were prepared. In accordance with the studies of Butt, Snell and Osterberg,² normal coagulation was obtained within two days with doses of from 100,000 to 200,000 Dam units of vitamin K plus 2 Gm. of desoxycholic acid. Some days later the coagulation defect began to set in again.

By ingestion of an emulsion of the vitamin in sodium desoxycholate solution by duodenal or stomach tube the same effect was obtained.

For injection purposes, concentrates having a strength of more than 1 million units per gram were used.

Intramuscular injection on two successive days of a watery emulsion of such a preparation representing 150,000 units of vitamin K resulted in normal coagulation three days after the first injection, an observation which is in accordance with the results reported by Dam and Glavind.

Intramuscular injection of an oil solution of the vitamin in a one day or in a three to five day period led to restoration of normal blood coagulation after one to two weeks, from 150,000 to 400,000 units in all being used for each patient. In some cases in which surgery was not employed, it could be shown that the effect lasted for at least three weeks.

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From the University of Illinois College of Medicine and Henrotin Hospital.

1. The substance used was Wilson Laboratories "Cortin."

Intravenous injection of emulsions—from 15,000 to 30,000 units in one dose—yielded normal blood coagulation within eighteen hours, but as in the case of peroral introduction the effect persisted for only a few days.

The foregoing results are in accordance with corresponding experiments on animals.

Similar results have been obtained with all three forms of administration against the hypoprothrombinemia of newborn and older infants suffering from icterus gravis neonatorum and certain related diseases.³

In urgent cases it is a great advantage that two rapidly acting forms of application are now available: intravenous injection and ingestion together with bile, of which the first is the most efficient.

The intramuscular injection of oil solutions is remarkable for the long duration of the effect.

The proper treatment of each case is rendered possible by taking advantage of the different modes of application, preferably by a suitable combination of them.

Biochemical Institute, University.

Special Clinical Article

TYPE SPECIFIC POLYSACCHARIDE SKIN TEST IN SERUM THERAPY OF PNEUMONIA

CLINICAL LECTURE AT ST. LOUIS SESSION

JOSEPH C. EDWARDS, M.D.

CHARLES L. HOAGLAND, M.D.

AND

LAWRENCE D. THOMPSON, M.D.

ST. LOUIS

The application of the intracutaneous test with type specific pneumococcic polysaccharide as a guide in serum therapy rests on a basis as sound theoretically as that of the Schick test in the measurement of dermal resistance to diphtheria toxin. In the case of the pneumococcus polysaccharide a positive reaction indicates resistance to the pneumococcus, while in the Schick test a positive reaction is indicative of a lack of such resistance. In either case, however, dermal reactivity is used as a criterion of the immune status of the whole organism.

That pneumococci are not alike was an observation made in 1897 by Bezançon and Griffon,¹ who reported serologic differences among morphologically indistinguishable pneumococci. Briefly, the intact pneumococcus cell may be considered to exist as a body, or soma, of bacterial protein, surrounded by a discrete capsule consisting of a carbohydrate substance of relatively complex structure. When released from the intact pneumococcus cell, this material is water soluble and may be precipitated from autolyzed cultures by

appropriate concentrations of alcohol or acetone, following in general the precipitation reaction of all complex soluble carbohydrates.

It was the significant discovery of this capsular material, or the so-called soluble specific substance, by Dochez and Avery in 1917² that has led to a more or less exact understanding of the qualitative differences existing among the thirty varying types of pneumococci.

The intensive studies of Heidelberger, Avery, Kabat and Goebel³ have given more exact information concerning the structure of certain of these type specific polysaccharides and their relation to specificity. The capsular material of the common groups, at least of types II, III and VIII, appears to be composed of dextrose and glucuronide units (aldobionic acid) in a carbohydrate chain. Type I contains, as a basic group, a trisaccharide with the two uronic acid molecules and an amino sugar.⁴ Until recently it was believed that the uronic acid group was common to all pneumococci and formed a basic antigenic unit. The structure of type XIV, however, does not conform to this concept, in that it is composed of hexosamine units with no demonstrable trace of uronic acid.⁵ In the case of II, III and VIII the difference appears to be chiefly one of stereochemistry, or the arrangement of the basic unit in space.

These polysaccharides when coupled with a more or less common pneumococcus protein form complete antigens. The orientation of the antigenic action in the production of antibody, however, is a function of the carbohydrate group comprising the capsule. Although in most animals the material depends on the protein portion for its complete antigenic action, it will, in its chemically pure form, react by precipitation with homologous antipneumococcus serums in dilutions as high as 1 to 4,000,000. Felton has studied its value as a vaccine.⁶

For use in skin testing only chemically pure capsular material can be employed. Much of the earlier work is equivocal, owing to the fact that impure carbohydrate substances were used. The pneumococcus contains, in addition to its type specific capsular polysaccharide, a so-called somatic, or C, fraction, which is nonspecific and may give a latent reaction directed against the nonspecific, or somatic, antibody. In addition, the somatic substance contains yeast nucleic acids and nucleoproteins which are severe skin irritants and often contaminate improperly prepared capsular material. A report of the more detailed technic employed by one of us (C. L. H.) in the isolation of the pure carbohydrate fractions will be published later. White, Robinson and Barnes discussed the various methods thus far employed.⁷

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From the Department of Internal Medicine, Washington University School of Medicine.

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The visiting and resident staffs and the laboratory personnel of St. Louis City Hospital, Barnes Hospital, St. Louis County Hospital, Jewish Hospital, St. Luke's Hospital and St. Mary's Hospital and the Department of Health of the City of St. Louis cooperated in this study. Eli Lilly & Co. supplied antipneumococcus rabbit serum and certain of the pneumococcus cultures from which Dr. C. L. Hoagland extracted the polysaccharides.

1. Bezançon, F., and Griffon, V.: Pouvoir agglutinatif du serum dans les infections expérimentales et humaines à pneumocoques, *Compt. rend. Soc. de biol.* 49: 551, 1897.

The rationale of the skin test itself rests on the observations of Mackenzie and Woo⁸ in 1925 of an allergic condition in the skin of guinea pigs following immunization by killed pneumococci. That the mechanism might be used as a guide in serum therapy was suggested in 1933 by Francis,⁹ who observed that 100 per cent of patients with type I pneumonia developed at the time of crisis an urticarial wheal following the intracutaneous inoculation of a dilute aqueous solution of type I capsular polysaccharide. In an earlier communication Tillett and Francis¹⁰ had observed that the skin reaction to capsular polysaccharide appeared in many patients after treatment with homologous anti-pneumococcus serums and that when such reaction occurred the prognosis was excellent. The fact that the reaction appeared quickly, sometimes within thirty minutes after serum administration, made it a desirable method of ascertaining when an adequate amount of serum had been administered without waiting for the drop in temperature and the clinical improvement which formerly were the only guides to adequate serum therapy.

It has been established by the work of Freund¹¹ and others that the skin is the last organ to become sensitized after the parenteral administration of immune serums. This knowledge is particularly applicable to the use of the skin test in the control of serum dosage, since a positive reaction must indicate complete organic saturation with antibody, a therapeutic ideal. That the skin test is also applicable to patients treated with horse serum as well as with rabbit serum has been established by MacLeod, Hoagland and Beeson¹² and Finland and Sutliff.¹³

CLINICAL STUDY

A total of 114 patients were treated with type specific antipneumococcus rabbit serum¹⁴ in several hospitals. Both serum and polysaccharide were available for types I, II, V, VII, VIII and XIV. In addition, we had polysaccharide for types III, IV and VI. It was confirmed by clinical trial that all were free of the C substance.

In an effort to make the study uniform, all the patients were examined by one of us, who viewed the roentgenograms, supervised the administration of serum and performed the polysaccharide skin tests before, during and after serum administration. Each serum was monovalent and was given intravenously by a method to be described in another report.

Technic of the Skin Test.—In each case 0.05 cc. of a dilution of 1:10,000 type specific polysaccharide in physiologic solution of sodium chloride is injected intracutaneously on the flexor surface of the forearm, and the edges of the wheal so raised are sharply dotted with ink to enable one to detect the slightest alteration

in contour or elevation after fifteen minutes. This is usually injected at the time of the tests for sensitivity to serum but may be delayed until after the intravenous test dose. If the rest of the serum is given in one or two doses within the next hour or so, there will usually be enough polysaccharide at the site of the previous test to react when sufficient serum has been given. It was our custom to repeat the test after each serum injection, although most of our serum was given as a large single dose one hour after the test dose.

If an urticaria-like wheal appears at the site of injection within twenty minutes, and especially if pseudopods form and the circumference of the wheal extends, the reaction is considered positive. A flare often accompanies the wheal formation but is not to be used as an index of positivity unless the control reaction is absolutely negative. It can be seen from the tables that the result is rarely positive until after serum has been given. Occasionally from five to eight days after onset, at or near the spontaneous crisis, the reaction becomes positive, indicating the presence of sufficient antibodies. Although not all patients have sufficient excess of antibodies to produce a positive result at the time of normal crisis, the majority will show it a day or so before or after normal crisis.

The test is repeated within three hours after the last serum has been given, and if the reaction is positive in the uncomplicated cases no more serum is needed. In the presence of complications such as bacteremia, more serum is needed even though the result is positive. A good rule to follow is to give more serum if there is doubt as to whether the reaction is positive or negative. An unequivocally positive reaction is always obtained after sufficient serum has been given, the only possible exception occurring when a patient is dying and has lost the reactivity of the skin.

Sterile stock solutions of the various capsular carbohydrates in 1:1,000 concentration in physiologic solution of sodium chloride keep indefinitely. For hospital use the 1:10,000 dilution keeps well at 40 to 60 C. all year, and from this dilution 0.1 cc. may be taken into a tuberculin syringe in order to inject 0.05 cc. intracutaneously. A similar amount of sterile physiologic solution of sodium chloride is injected as a control.

Scheme of Dosage.—Since few patients with fully developed pneumonia require less than 60,000 units of antiserum, this amount or more may be given as an initial dose, after which the absence of a positive reaction to the intracutaneous polysaccharide test is an indication for giving additional doses of 20,000 to 40,000 units at two hour intervals until the reaction becomes positive. Thus this test enables one in a sense to titrate with antibody, the type specific capsular carbohydrate being the indicator and a positive skin reaction denoting the end point.

It is difficult to establish clinically the point at which adequate serum has been given. A fall in the patient's temperature is an uncertain index, as it may follow temporarily the administration of any serum or foreign protein. If one waits for a secondary rise in temperature valuable time is lost, and a one or two day pneumonia may be converted into a two or three day disease with the attendant statistical increase in mortality.

With the use of the skin test, the delay between the first and the second dose is a matter of only two or three hours. Frequently the reaction becomes positive while the first dose of serum is being given, thus enabling one to save the unopened vials containing the

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14. Refined, unconcentrated, supplied by Eli Lilly & Co.; hereafter referred to as "serum."

balance of the clinically estimated dose. In this way the test obviates the necessity for overtreatment. It has been customary in the past to overtreat as the lesser of two evils. In fact an amount in excess of the clinically calculated dose was formerly given in order to be safe. Overdosage offers no clinical advantage and subjects the patient to needless expense. Since the saving effected by the use of this test in our series amounted with but few exceptions to 20,000 to 100,000 units per

TABLE 1.—Incidence of Positive and Negative Polysaccharide Skin Test Before Serum Therapy

Type of Pneumonia	Number of Patients	Number with Positive Test Before Serum	Number with Negative Test Before Serum	Number of Deaths
I.....	52	2	50	2
II.....	14	0	14	1
V.....	13*	1†	12	2
VII.....	14	0	14	0
VIII.....	19	1	18	0
XIV.....	2	0	2	0
Totals.....	114	4	110	5

* Two type V patients treated before polysaccharide was ready for use are not included.

† The only one of the five who died that had a positive test before serum.

patient, it is apparent that where serum is supplied to indigent patients by the state the use of the test has immense economic value.

In the presence of complications such as empyema, the temperature, pulse and respiration are no longer valued criteria of adequate therapy. Clinically the patient appears to need more serum, and frequently the presence of empyema may not be suspected. A positive skin reaction in such an instance indicates that the patient can be benefited not by additional specific therapy but only by procedures which will remove the focus of infection.

The presence of a positive skin reaction in the absence of clinical improvement after serum has been given may be the first sign of incipient pus or bacteremia.

It must be emphasized that in the rare cases, perhaps with bacteremia or endocarditis, the reaction may be negative even though type specific antibody is demonstrable in the blood and when the infection may be advancing. In such cases the skin test cannot be used as a criterion for serum dosage.

RESULTS

From table 1 it can be seen that of a total of 114 patients with pneumonia 110 had negative reactions to the polysaccharide skin test before serum therapy. Of these, 105 showed a positive reaction after serum. Of the four patients who showed a negative result after serum, three subsequently died although they received more than enough serum (300,000 to 400,000 units) to cause a strongly positive skin reaction in the average patient with the same number of lobes involved.

Duration of Positive Reactivity to Skin Test.—In the few cases in which there was a history of hives, it was noted that the control with physiologic solution of sodium chloride did not cause a reaction. When skin tests were performed during the days of serum sickness, the results were in no instance interpreted as positive unless they were also positive after the recovery from serum disease.

From table 3 one can see that the patients who recovered displayed great variability in the duration of positive reactivity to the skin test after serum therapy. The duration did not vary directly with the dosage of serum or with the period from onset of the disease to the time serum was given. If, however, serum is given late in the course, the concentration of antibodies supplied by the patient himself may be increasing. The average duration was about ten days after serum was given. There seemed to be no relation between length of the positive phase of the polysaccharide test and serum sickness. The patients with complications tended to have a longer phase of reactivity than did those without complications.

Type I Pneumonia.—Of the fifty-two patients tested before and several times after serum therapy, only two had a positive result before serum was given. Of those with a negative result before serum all but one reacted positively after serum. This patient was given 60,000 units in the thirty-sixth hour of his pneumonia. The injection was followed within twenty-four hours by a crisis but without appearance of a positive reaction. Of the two patients who died, one had a positive reaction before serum therapy on the fifth day of disease and the blood culture became sterile after the total of 360,000 units had been given. Death occurred nine days later. At autopsy, consolidation of the entire right lung with an acute aortic endocarditis was demonstrated. The other patient's reaction remained negative before and after serum in the presence of fatal bacteremia.

Type II Pneumonia.—Fourteen patients were tested and all showed a negative reaction before and a positive reaction after serum was given. The only patient who died was admitted eight days after onset, was delirious and had bacteremia. Although patients with bacteremia late in the disease usually have sufficient antibodies to produce a positive reaction before serum is given, this patient did not, which of itself may be a bad prognostic sign. Blood taken before and twice after serum was given failed to show any agglutination with type II smooth organisms and only slight aggluti-

TABLE 2.—Results of Skin Tests After Serum Therapy in Patients Showing a Negative Test Before Treatment

Type of Pneumonia	Number of Patients	Results of Tests of Patients Who Recovered		Results of Tests of Patients Who Died	
		Positive	Negative	Positive	Negative
I.....	50	48	1	1	1
II.....	14	13	..	1	..
V.....	12	10	..	..	2
VII.....	14	14	..	..	..
VIII.....	18	18	..	..	..
XIV.....	2	2	..	..	..
Totals.....	110	105	1	2	3

nation to a rough type II strain after serum was given. The result of the polysaccharide test was also negative. Large amounts of serum may fail to cause a positive reaction in such cases. Lack of tissue or skin reactivity may be a factor when antibodies are present but the result of the skin test is negative.

Type V Pneumonia.—Twelve of thirteen patients had a negative reaction before serum was given. One of the two patients who died, who had a positive reaction before serum therapy on admission, three weeks after onset of the disease, had bacteremia with empyema. In spite of a normal temperature for three days and a negative blood culture after being given 300,000 units

of type V serum, he died on the ninth hospital day. Autopsy revealed an acute pneumococcus aortic vegetation. The other patient who died had negative reactions both before and after treatment with 340,000 units of serum. Bacteremia disappeared with seeming clinical improvement for several days. On the ninth hospital day death suddenly occurred from circulatory failure.

Type VII Pneumonia.—All fourteen patients had negative reactions before and all had positive reactions after serum therapy, with recovery.

Type VIII Pneumonia.—Of nineteen patients, eighteen had negative reactions and one a positive reaction before administration of serum.

Type XIV Pneumonia.—Two patients had negative reactions before and positive reactions after serum was given. Both recovered.

Pneumonia of Types III, IV and VI.—Several patients were tested at intervals and after the crisis, which occurred either spontaneously or with the aid

VIII skin test was positive. The next day it was 3 plus; it became negative one week later. The patient recovered uneventfully.

J. B., aged 72 years, the husband of M. B., was admitted four days after his wife on the second day of his disease, which partially involved the right upper lobe, beginning at the hilus. This was also due to the type VIII pneumococcus. The temperature was 102.6 F., pulse rate 115 and respiratory rate 26. The type VIII polysaccharide test did not produce positive results until after 100,000 units of serum had been given. Crisis occurred within twelve hours. The reactions remained positive for the duration of the hospital stay of ten days.

V. P., aged 28 years, was admitted on the eighth day of type II pneumonia and had 100,000 units of type II serum; the reaction did not become positive until another 40,000 units had been given. Crisis occurred in twenty-four hours and recovery ensued. In this case one would have estimated that an additional 40,000 units, at least, was necessary.

L. C., aged 21 years, was given 100,000 units of type I serum on the fourth day of pneumonia of type I in the left lower lobe. The polysaccharide test produced a negative reaction before and a positive reaction one hour after the serum therapy. In twelve hours, however, the reaction was negative although the temperature was normal. Subsequent tests gave negative results for the next seven days, after which the reaction became positive again, on the eleventh day from onset of the pneumonia, remaining positive for the next three days of the hospital stay. More serum was not given when the reaction became negative because clinically the patient was well on the road to recovery, with normal temperature and respirations and with but slight elevation of pulse rate. Had the temperature become elevated above 101 F. (rectal) with a negative reaction, in the absence of other causes for the temperature, more serum would have been indicated.

If the temperature remains elevated, the reaction positive and the disease unaffected by the usual amount of serum, the sputum should be retyped. Thus it is best to combine clinical judgment with all tests. Apparently enough serum was given to control the infection but not enough to diffuse into the skin and react with the polysaccharide. If bacteremia had been present, more serum would have been indicated as soon as this was determined, in spite of a positive or negative reaction to the skin test with type specific polysaccharide.

PNEUMONIA OF MORE THAN ONE TYPE

That the polysaccharide test is of value in the differential treatment of pneumonia due to more than one type is shown by the following cases:

A 26 year old woman entered on the second day after onset of pneumonia with a chill, cough and rusty sputum. Types III and VIII pneumococcus were directly found in the sputum by the modified Neufeld technic. Early consolidation of the right lower lobe was present. Since the type VIII organisms were present in greater number per oil immersion field than the type III, 80,000 units of type VIII serum was given and crisis occurred in twelve hours. The reaction was negative for types III and VIII before and positive for type VIII after serum therapy.

A patient with type I pneumococcal pneumonia, recovering spontaneously, was admitted on the tenth day with a temperature of 104 F. after two days of normal temperature. Careful physical and roentgenographic examination revealed a parenchymal process in the right middle lobe. The original process had been in the left lower lobe. A skin test with type I polysaccharide yielded unequivocally positive results, showing the presence of a homologous antibody and reactive dermis. The presence of empyema was not suggested by physical and roentgenographic signs. No sputum was available, whereupon a lung puncture was performed; type VIII pneumococcus was isolated directly from the new area of involvement. There was prompt defervescence following the administration of type VIII anti-pneumococcus serum; on recovery the patient reacted to both type I and type VIII polysaccharides.

TABLE 3.—Duration of Positive Skin Test*

Days	Reaction Negative After Positive Phase	Units of Serum, Thousands	Reaction Positive on Patient's Discharge	Units of Serum, Thousands
3	1	60	1	140
5	2			
7	3	100, 80, 100	2	120, 240
9	3	100, 80	7	100
11	1	260		
13	..	...	3	220, 170
15	..	...	2	100, 100
17	1	80	2	100, 100
19	..	...	4	60, 200
27	..	...	1	160
31	1	220	1	220
Total cases	12		23	

* In thirty-four of the thirty-five cases reactions were negative before serum was given.

of sulfapyridine. In general, the patients treated with sulfapyridine had a negative reaction before the fifth day of the pneumonia, even those whose temperature fell on the first or second day. Very few had a positive reaction after the sixth to tenth day from the onset of the pneumonia, the time at which antibodies naturally occur in high concentration. Of the few patients seen at the time of spontaneous crisis, several had positive reactions to the polysaccharide test and recovered without specific therapy.

PNEUMONIA OF A SINGLE TYPE

A 21 year old man was admitted on the third day of type I pneumonia with a rectal temperature of 104 F., pulse rate of 100 and respiratory rate of 32 per minute. Slight cyanosis and delirium were present. The lower lobe of the right lung was consolidated. Clinically, it was estimated that at least 140,000 units of serum would be necessary and we prepared to give 160,000 units. The type I polysaccharide test, however, produced a positive reaction by the time 100,000 units of serum had been given. Crisis followed in twelve hours. Several such instances could be cited of patients in the older age group.

M. B., aged 70 years, was admitted on the seventh day of type VIII pneumonia with a temperature of 103 F., pulse rate of 100 and respiratory rate of 24. There were no signs of approaching crisis. The white cell count was 30,400, with a marked shift of segmented leukocytes. Consolidation of the right middle lobe was evidenced by physical signs and a roentgenogram. Types I and VIII polysaccharide skin tests yielded negative results. Eighty thousand units of type VIII serum caused a crisis in sixteen hours, and the reaction to the type

T. H. had a typical onset with chills and rusty sputum three days before entry. Type VII pneumococcus was isolated directly from the sputum and 100,000 units of type VII horse serum was given. Two days later the temperature was still elevated, being 104.6 F., the pulse rate was 122 and the respiratory rate 32. Since the reaction to the type VII polysaccharide test was positive we were assured that enough serum had been given. No evidence of empyema or bacteremia was found. Accordingly the sputum was retyped, and this time type I pneumococcus was found in abundance with a few type VII organisms. Type I skin test was negative and 160,000 units of the homologous serum was given before the skin reaction became positive for type I, this being the fifth day of the disease. Within twenty-four hours the temperature was normal. Reaction to the type VII polysaccharide test became negative eleven days after serum was given, when the reaction to the type I test was still positive. Recovery was uneventful.

In seven instances of pneumonia with more than one type of pneumococcus in the sputum, the skin test enabled us to know that adequate amounts of serum had been given for one of the types in each case and that serum was the logical cause of the crisis which occurred within at least forty-eight hours and before the seventh day of the disease. In two of these cases, lung puncture was done to determine the actual cause of the pneumonia, which proved to be pneumococcus of the same type as that for which serum was given. This was necessary when the multiple types in sputum were of the more common variety. Sulfapyridine can also be used to advantage in such cases.

FOUR SPECIAL CASES

All patients were treated without selection as soon as the organism could be typed. Four patients who were moribund on admission were treated with serum in order to determine what little benefit might accrue. In all but one of these cases, which will be described, the type specific polysaccharide test was found to give negative results before and after therapy with large amounts of serum. It appears that in the presence of terminal shock the skin is no longer reactive. The reaction was positive before and after serum administration in one moribund patient admitted twenty-one days after onset of type V pneumonia involving the entire left lung, with an encapsulated empyema and type V pneumococcus in the blood culture. The blood culture was sterile after 300,000 units of serum had been given. The temperature was almost normal for three days after serum therapy, but the patient died on the ninth hospital day. Sulfapyridine was given the day after the second rise in temperature and continued for five days. Aortic valvular pneumococcal endocarditis was seen at autopsy in addition to the lesions described. The other three patients died within twelve hours of admission but none of them had a serum reaction. There were no great variations in blood pressure and pulse.

SUMMARY

In 114 cases of lobar pneumonia caused by type I, II, V, VII, VIII or XIV pneumococcus, type specific antipneumococcus rabbit serum was used. The reaction of the patient to intracutaneous tests with the type specific polysaccharide from the capsule of a homologous type of pneumococcus was determined before, during and after the administration of the serum.

One hundred and ten of the patients had a negative reaction to the test, indicating a low content of circulating antibody, before serum was given. The test proved to be a valuable aid in the more accurate esti-

mation and control of the optimum dose of serum necessary for the successful treatment of the patient.

In thirty-five cases, daily skin tests with the polysaccharide were performed until the patient was discharged from the hospital. In twelve of these cases the reaction became negative before the patients were discharged (seven to nine days), and in twenty-three it remained positive (nine to nineteen days).

In some cases without complications, a positive reaction to the skin test at the time of admission on the sixth or seventh day of the pneumonia enabled us to withhold treatment with the assurance of the presence of sufficient antibodies to cause a crisis with favorable outcome. Not all patients with spontaneous crises, however, have the excess of free antibodies necessary to cause a positive reaction to the test. Some patients with myocardial damage or cardiac decompensation need serum even though they show a positive reaction.

A persistently negative skin reaction appears to have some value from a prognostic standpoint. In most cases in which a positive reaction did not occur after the administration of large amounts of serum the disease terminated fatally. In such cases the blood agglutinins were often found in high titer. A skin formerly reactive to polysaccharide may lose its reactivity, even in the presence of free circulating antibody, when the patient is moribund. A positive reaction in a patient with bacteremia does not mean that no more serum is needed. Dermal injection of pneumococcus polysaccharides into human beings may induce subsequent reactivity of the dermal cells, and this fact is to be borne in mind in studies of skin sensitivity when repeated intradermal injections of these agents are involved.¹⁰

The polysaccharide skin test is a valuable, though not infallible, means of measuring the serum required for treatment in a given case of pneumococcal pneumonia.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, SECRETARY.

AUGUSTANA MODEL SAFETY GAS OXYGEN APPARATUS ACCEPTABLE

Manufacturer: Safety Gas Machine Company, 1163 Sedgwick Street, Chicago.

This unit is designed for the administration of inhalation anesthesia. It utilizes D cylinders of oxygen, carbon dioxide, nitrous oxide and ethylene, with provision conveniently made for one extra tank of each gas to be attached to the apparatus. In addition, there is an extra yoke provided for the administration of cyclopropane. To each of the sets of yokes (except those for cyclopropane) to which the cylinders are connected is attached a competent reducing valve. The cyclopropane yoke has a pressure gage attached with which the operator may estimate the amount of gas remaining in the cylinder. The units are so designed that different gases cannot leak from one cylinder to another unless the cylinders are connected to the machine in a way other than specified.

There is a central mixing chamber into which gases may be admitted for delivery either singly or in various combinations. A gas is admitted to the mixing chamber through a visible sight-feed in an individual water manometer. All manometers displace against a common head of water. The flow of each gas may be regulated by individual needle valves; thus any desired proportions within reasonable limits may be obtained. There is a by-pass valve as a quick source of supply for oxygen. The manometers are apparently each graduated in gallons per hour.

There is an ether vaporizer attached, which permits the addition of ether vapor to the delivered gas mixture. It is so arranged that the gases may be passed in varying proportions through the ether container by regulation of the valve.

The remainder of the apparatus consists of a typical so-called "circle filter" carbon dioxide absorption unit. The canister containing the soda lime may be shut off from the circuit at will.

An exhalation valve enables the operator to utilize the so-called "open," "semiopen," or "semiclosed" technics of anesthetic administration. The valves are apparently of a rubber fabric material. The rubber tubing and breathing bag appear to be durable. The size of the bags, type of face masks and soda lime mesh are optional.

The apparatus is supported adequately on a pedestal equipped with rubber-tired casters. Even though somewhat large, it is easily wheeled about.

The unit was submitted to a qualified physician, who studied its therapeutic efficiency and applicability. The following was concluded from his report:

There is some resistance to respiration, as in all types of so-called "circle-filter" anesthetic apparatus. This is of the order of 2 to 4 cm. of water with ordinary breathing. While this resistance is of little import in a healthy subject, in the case of a debilitated patient undergoing a long operation it is sometimes of considerable importance. It is common to all models of this type of apparatus of all manufacturers.

When the carbon dioxide absorber is in the breathing circuit, it efficiently removes carbon dioxide. This was proved by actual chemical gas analysis. It was found that 4-8 mesh soda lime produced somewhat less resistance than an 8-14 mesh to breathing and was just as efficient in its removal of carbon dioxide.

A comparatively small breathing bag allows for more flexibility, in that anesthetic mixtures can be changed more rapidly and smaller quantities of gas or vapor are necessary.

The investigators commented that they saw no serious objections to the use of this apparatus. They qualified this statement to this extent: Any skilled anesthetist can give good anesthesia with any piece of apparatus within certain limits. In the last analysis, it is the anesthetist rather than the apparatus that gives the anesthesia.

The Council makes no comment expressed or implied regarding any explosion hazard. It is extremely difficult to determine conditions for such safety.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Augustana Model Safety Gas-Oxygen Apparatus for inclusion in the Council's list of accepted devices.

DUAL-SPECTRUM ULTRAVIOLET LAMP, MODEL 300, ACCEPTABLE

Manufacturer: Bristow and Company, 2831 West Pico Boulevard, Los Angeles.

The Dual-Spectrum Ultraviolet Lamp, Model 300, is a therapeutic lamp designed exclusively for the use of the physician. Evidence was provided to show that 82 per cent of the radiation is between 2,000 and 2,600 angstroms, 16 per cent between 2,600 and 3,000 angstroms and 2 per cent between 3,000 and 3,200 angstroms. The firm claims that, by the use of special glass tubing in addition to quartz tubing, approximately 50 per cent more energy is provided between the bands 2,600 and 3,000 angstroms than is customary with quartz construction.

The lamp consists of a base containing three transformers; a tubular stand supporting the lamp, a time clock, cable attachment, switches and an official unit (Council accepted August 1938); and a reflector containing the burner. The weight of the unit is 47 pounds, the outside diameter of the reflector is 36 cm., and the supporting column is adjustable to different heights. An air cushion in the column serves as a shock absorber. The reflector is adjustable horizontally and vertically and may be rotated in both axes.

The reflector, with a bakelite back and an aluminum shell, supports two types of tubing in the burner. One is of quartz and another of a special composition glass which is coiled side by side with the quartz tubing in a flat hexagonal pattern. These tubes contain mercury and a mixture of inert gases and are energized by two transformers made for 50 to 60 cycle current, with 115 volts on the primary and 1,800 volts on the secondary at 90 M.A. Together they consume 180 watts. The official transformer has the same specifications on the primary side with 2,000 volts on the secondary at 9 M.A.

The firm submitted evidence regarding the radiation (including two spectrograms), power consumption and other physical data. The lamp was reported to produce the intensity of ultraviolet light in microwatts per square centimeter shown in table 1.

TABLE 1.—Intensity of Ultraviolet

	Quartz Light	Special Glass	Both
At 4 inches.....	5,300	2,300	6,200
At 24 inches.....	510	320	640

According to the report of physiologic tests carried out on abdominal untanned skin at 24 inch spacing, the erythema time on this lamp is as given in table 2.

TABLE 2.—Calculated Minimum Perceptible Erythema Time

	Seconds
Quartz light	75
Special glass light.....	105
Both	52

The lamp was examined by the Council, and the claims were found to be acceptable from a physical standpoint, and the lamp was determined to be adequate for clinical service.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Dual-Spectrum Ultraviolet Lamp, Model 300, for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

AZOCHLORAMID (See New and Nonofficial Remedies, 1939, p. 256).

The following dosage form has been accepted:

Azochloramid Saline Mixture Tablets, 8.5 grains (for preparing 2 ounces of a 1:3,300 aqueous solution): Each tablet contains azochloramid 0.28 grain, sodium chloride 7.60 grains, disodium phosphate 0.54 grain and monopotassium phosphate 0.08 grain.

BACTERIAL VACCINE MADE FROM THE TYPHOID BACILLUS AND THE PARATYPHOID "A" AND "B" BACILLI (See New and Nonofficial Remedies, 1939, p. 443).

The Gilliland Laboratories, Inc., Marietta, Pa.

Typhoid-Paratyphoid Bacterial Vaccine Immunizing.—Also marketed in 50 cc. vials, twenty immunizing doses containing in each cubic centimeter 1,000 million killed typhoid bacilli, 500 million killed paratyphoid A bacilli and 500 million killed paratyphoid B bacilli.

ANTIMENINGOCOCCIC SERUM (See New and Nonofficial Remedies, 1939, p. 403).

The National Drug Company, Philadelphia.

Antimeningococcic Serum, Refined and Concentrated.—In packages of two 10 cc. double-end ampule-vials with intraspinal and intravenous needles; in package with intravenous needle and one 10 cc. double-end ampule-vial with gravity outfit and intraspinal needle; and in packages of one 20 cc. ampule-vial, with outfit (hospital package). A 1 cc. vial of 1:10 dilution of the specific serum is included with each package to determine the sensitivity of the patient.

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SATURDAY, NOVEMBER 18, 1939

EVOLUTION OF OUR KNOWLEDGE OF TUBERCULOSIS

Subtle, evasive, paradoxical, intricate and complex are terms that apply to the microscopic parasite which a recent writer¹ characterizes as "A Bug Full of Tricks." The early history of devastation wrought by this armored enemy of mankind is still preserved in the distorted joints and spinal columns of prehistoric skeletons and Egyptian mummies. The recent history is accumulating much faster than is the record of many other parasites that revolve about the microscopic or chemical and immunologic analysis.

The code of Hammurabi, written at least 2,000 years B. C., indicates some knowledge then of tuberculosis. Greek writers described the clinical features of tuberculous disease in the fifth century B. C. In the second century Arctaeus not only accurately described the clinical features but suggested routine treatment. In spite of their keen observations, Hippocrates and Galen recognized the hopelessness of a problem that appeared entirely occult. Galen probably never suspected that his own illness was a manifestation of phthisis, for bizarre beliefs befogged the issue. Fracastorius in 1546 expressed the belief that phthisis was due to invisible germs. Paracelsus in 1567 wrote about miners' phthisis. Franciscus Sylvius in 1650 suggested the connection between scrofula and phthisis and that tubercles precede phthisis. The first postmortem report of miliary tuberculosis was given by Manget in 1700, about which time Morgagni refused to perform necropsies on the victims of phthisis because of his fear of contagion.

The tuberculosis death rate reached its highest point about the middle of the eighteenth century, coincident with rapidly increasing facilities for the acquisition of knowledge. Auenbrugger made an epochal contribution in describing immediate percussion in 1761. Late in the eighteenth century Whytt described tuberculous meningitis, and Pott tuberculous destruction of the

spine. In 1816 Petit described laryngeal tuberculosis, and Portal suggested a connection between consumption and engorgement of lymphatics. It is said that William Stark, who was studying the pathology of phthisis in London under the renowned John Hunter, died of tuberculosis as the result of a wound received in the morgue. Baillie, the successor of Stark, also developed an infection of the hand after performing a necropsy and died of tuberculosis, but not until his years of study had clarified the knowledge of the tubercle.

At the turn of the nineteenth century Willan discussed the relation of erythema nodosum to tuberculosis. Bichat advanced from the organ pathology of Morgagni to tissue pathology within the organ. Bayle presented in his volume "Pulmonary Phthisis" clinical observations checked by more than 900 necropsies. Corvisart popularized percussion early in the nineteenth century. Later Piorry's method of percussion and Laënnec's new method of auscultation had a profound influence on the progress of physical diagnosis. Laënnec appropriated all previous scientific advances and with remarkable genius drew up a minute history of nearly 400 cases of phthisis before he was 22 years of age. He recorded virtually all that is now taught about the physical diagnosis of diseases of the thorax. He published in 1918 nearly 800 pages on auscultation and diseases of the chest. The advances of the nineteenth century would not have developed so rapidly without the invention of the stethoscope by Laënnec, who himself died of pulmonary tuberculosis. Contemporary with Laënnec, the great clinician Louis, who also suffered from tuberculosis, correlated the symptoms and pathology in the light of the necropsy, and through his teachings and pupils—Oliver Wendell Holmes, George C. Shattuck, William Pepper, Gerhard, Stille, Power, Swett and Clark—he was largely responsible for the establishment of clinical medicine, with special interest in physical examination, throughout the world. Virchow, contemporary with Louis, advanced from tissue pathology to cellular pathology and joined the dualist Schönlein, who coined the word "tuberculosis." At the University of Vienna, Skoda's (1805-1881) skill in diagnosis by means of percussion and auscultation led to the establishment of a special department on chest diseases to which students came from all parts of the world. Skoda's work was brilliantly complemented by his great contemporary Rokitansky, who is said to have performed more than 30,000 postmortem examinations.

A great scientific awakening was imminent by the middle of the nineteenth century. Villemin demonstrated in 1865 in a series of masterly experiments the specific nature of tuberculosis by means of inoculation. Gerlach in 1870 proved that milk from tuberculous cows may convey the disease. Medicine began to move into a new era, which was to see

1. Moorman, Lewis J.: A Bug Full of Tricks, J. Oklahoma M. A. 32:204 (June) 1939.

the development of modern laboratory methods. The tubercle bacillus was seemingly preparing a way for its own discovery and for the surrender of many of the secrets of its occult powers. The first pathologic laboratory was established by Virchow in Berlin in 1856 and the first hygienic laboratory by Pettenkofer in 1878. In 1882 Koch discovered the tubercle bacillus. Just before Koch's discovery Trudeau, Dettweiler and others became pioneers in the sanatorium management of patients, and in a short while artificial pneumothorax, another revolutionary method of treatment, was to be introduced by Forlanini.

Four thousand years has been surveyed for this brief statement of evolution of knowledge of this disease. Still from year to year more and more is being written. As the unsolved problems related to the tubercle bacillus remain infinite, so tuberculosis remains the greatest killer of man during the most useful period of his life.

POSTSCARLATINAL NEPHRITIS

Some years ago Burky¹ announced a discovery which many immunologists credited with opening up "so many new broad and inviting possibilities that it is fairly bewildering."² He found that lens proteins are nonantigenic when injected into homologous animal species. If the lens substance is mixed with staphylococcus filtrate, however, its latent antigenicity is in some way activated or supplemented, so that it becomes an effective sensitizing or immunizing agent. Rabbits injected with toxin "synergized" or "potentiated" lens protein not only develop antilens precipitins of high titer (e.g. 1:50,000) but also develop degenerative lesions in their own crystalline lens. These lesions duplicate the picture found in human cases of endophthalmitis phaco-anaphylactica. Extending his work to other tissue products, Burky found that in rabbits high titer antibodies could be produced by combining staphylococcus toxin with homologous muscle proteins.

Since the publication of Burky's discovery, many attempts have been made to apply his synergic technic to the production of improved vaccines and antisera. A few attempts have been made to apply it to the etiology of senescence or degenerative disease. The latest is its application to the etiology of post scarlatinal nephritis.

Lindemann³ showed that a condition closely simulating glomerular nephritis can be produced in laboratory animals by intravenous injection of heterologous anti-kidney serum. Animals injected with such cytotoxic serums develop albuminuria, hematuria, cylindruria, oliguria and occasionally anuria. In all these tests, however, the nephrotoxic serum was produced in a foreign animal species. All attempts to develop a nephrotoxic serum by injecting rabbits with homologous kidney

material have thus far been unsuccessful. Kidney proteins, apparently, are nonantigenic in the body of the animal of origin.

Applying the Burky technic, however, Schwentker and Comploier,⁴ of the Baltimore City Health Department, injected rabbits with rabbit kidney emulsions plus streptococcus or staphylococcus toxin. High titer nephrotoxic serums were produced by both technics. Specific absorption tests showed that the antisera thus produced contain at least two nephrotoxic antibodies. First there was a relatively high titer complement deviating antibody, specific for kidney parenchyma. This is accompanied by a relatively low titer antibody, which reacts with both kidney and brain emulsions. This second antibody is interpreted by the Baltimore clinicians as presumably specific for the connective tissue elements common to brain and kidney.

Having shown that toxin reinforced emulsions of homologous kidney are antigenic in rabbits, the Baltimore clinicians attempted to determine whether or not specific nephrotoxic antibodies are developed in the human body during the course of streptococcal infections. Complement fixation tests were therefore made with the sera of forty patients in various stages of scarlet fever, with twenty-nine control tests on patients without any sign of streptococcal infection. Thirty-seven (92 per cent) of the scarlet fever patients gave positive nephrotoxic serum reactions, as contrasted with but three (10 per cent) of the control patients. These results indicate that most persons suffering from scarlet fever develop circulating antibodies against their own kidney tissues, a reaction rarely seen in normal persons and then presumably due to unrecognized staphylococcal or streptococcal infection.

From these data Schwentker and Comploier conclude that streptococcus toxin damages some of the kidney tissue during the primary infection in scarlet fever. This damage may be clinically insignificant. The denatured kidney proteins thus formed, however, are released, "activated" or "potentiated" to "complete" antigens, stimulating the production of antibodies specific for kidney tissue. These antibodies may be of sufficiently high titer to give rise to acute hemorrhagic nephritis. A similar immunologic vicious circle had been previously proposed by Schwentker⁵ to explain the etiology of postinfectious encephalomyelitis. The clinical and pathologic picture of encephalomyelitis is readily produced in monkeys by repeated injections with partially denatured brain emulsions. If the Schwentker theory of the etiology of postscarlatinal nephritis is confirmed, the development of a logical method of interrupting or preventing the nephrotoxic immunologic vicious circle should not be beyond ingenuity.

1. Burky, E. L.: *J. Allergy* 5: 466 (July) 1934.

2. Cooke, R. A.: *J. Allergy* 5: 473 (July) 1934.

3. Lindemann, W.: *Ann. Inst. Pasteur* 14: 49, 1900.

4. Schwentker, F. F., and Comploier, F. C.: *J. Exper. Med.* 70: 233 (Sept.) 1939.

5. Schwentker, F. F., and Rivers, T. M.: *J. Exper. Med.* 60: 559, 1934; 61: 689, 1935.

COMBINED (ACTIVE-PASSIVE) DIPHTHERIA PROPHYLAXIS

Fifteen years ago Ramon and Lafaille¹ suggested a new method of prophylaxis against diphtheria. By this improved method the transient passive immunity caused by injecting antitoxic serum is supplemented by a semi-permanent active immunity caused by the simultaneous injection of diphtheria toxoid. A number of European investigators confirmed the theoretical possibility of such combined immunization in laboratory animals. Gundel and König,² for example, found that by a proper selection of dosage and type of antiserum and of toxoid a relatively permanent active immunity could be superimposed on the transient passive immunity in rabbits. This combined immunity was sufficient to protect laboratory animals from diphtheria toxin over a long period. The only question undetermined by their work was whether or not a similar duplex immunization was possible or feasible in man.

Now the clinical feasibility of this combined technic is denied by Paschla³ and by Frey and Schmid,⁴ of the Red Cross Hospital, Vienna. They injected 2,000 units of antidiphtheritic horse serum, cow serum or sheep serum intramuscularly into each of twenty children, followed by single or multiple subcutaneous injection with diphtheria toxoid. Alum toxoid was used in most of the tests. The degree of combined active-passive immunity was estimated in these children by periodic titrations of the blood serum.

As a typical example of their data, the antitoxin titer rose to 1.75 units per cubic centimeter of the patient's blood by the third day after the duplex injection. This titer then fell to 0.4, 0.2 and 0.1 unit respectively by the end of seven, fourteen and twenty-one days. On the twenty-eighth day only a trace of the passively transferred antitoxin was detectable, which trace completely disappeared by the forty-fifth day. Active immunity was not demonstrable. Control patients injected with toxoid alone developed relatively high antitoxic titers.

Under the conditions of their test, therefore, the toxoid was not only an ineffective immunizing agent but apparently had the deleterious effect of hastening the elimination or destruction of the transferred antitoxin. Their general conclusion is that combined active-passive immunization is not feasible in human medicine, the two types of immunization being incompatible with each other. This conclusion was dramatically confirmed by one of their patients, who contracted diphtheria during the course of their attempted duplex immunization. Whether or not a combined active-passive immunity is possible or feasible in specific infections other than diphtheria was not tested by the Austrian clinicians.

1. Ramon, Gaston, and Lafaille, André: *Compt. rend. Soc. de biol.* 93: 582 (Aug. 14) 1925. Ramon, Gaston: *Ann. Inst. Pasteur* 42: 959 (Sept.) 1928.

2. Gundel, M., and König, F.: *Ztschr. f. Immunitätsforsch. u. exper. therap.* 92: 235 (Feb. 18) 1938.

3. Paschla, Günther: *Klin. Wchnschr.* 18: 7 (Jan. 7), 60 (Jan. 14) 1939.

4. Frey, Leopold, and Schmid, Eddehard: *Ztschr. f. Immunitätsforsch. u. exper. therap.* 95: 486 (June) 1939.

Current Comment

THE CHRISTMAS SEAL

Two hundred thousand persons are alive in the United States today who would have been dead of tuberculosis if last year had been 1904. Since that year, which marked the inception of the National Tuberculosis Association, the mortality rate from this disease has been cut down from 201 deaths per hundred thousand of population to 49 in 1938. People are now being urged to buy Christmas Seals, which help to finance the work of this association and its 2,500 affiliated organizations in all parts of the country. A part of the money derived from the sale of these seals goes into a fund which maintains a rehabilitation program for tuberculous persons in sanatoriums. But the real problem in fighting tuberculosis involves education: Those who have tuberculosis in its incipient stages can be cured if they are aware of their disease. In order to find these early cases, the people must be educated to look for it. In spite of the improvement of diagnostic methods, only 13 per cent of patients admitted to sanatoriums are found to be in the early stages of the disease, thus showing that there are far too many with unrecognized cases in the community infecting their families and neighbors. Only by finding every single case can the disease be eliminated. Early examination, skilful diagnosis and prompt treatment are the factors that make tuberculosis curable and preventable. Persons with questionable cases should be promptly examined.

TESTIMONIALS OF THE DEPARTED FOR VALENTINE'S MEAT JUICE

An early report of the Council on Pharmacy and Chemistry (1909) pointed out that Valentine's Meat Juice was being promoted with fallacious claims that it is highly nutritious and is valuable in the treatment of pneumonia, diphtheria and typhoid. Such claims are no longer made. Recently physicians have received a letter referring to an accompanying booklet containing the "experience of Physicians who have, themselves, suffered from Gastric and Intestinal troubles and found Valentine's Meat-Juice of much comfort and satisfaction." Of the testimonials (twenty-one in number) eleven were from abroad. Of those supposed to have been given in the United States, it is interesting to note the following testimony of Dr. C.:

"Having had a very long and exhausting attack of Typhoid Fever, lasting from June until the following December, VALENTINE'S MEAT-JUICE was the only article of nourishment I could take and the only one I required. Yet long before my illness I had prescribed it in my practice in every variety of medical and surgical diseases coming under the care of a busy practitioner. I have never yet met with a case from Infantine life to Old Age that VALENTINE'S MEAT JUICE could not be given with the greatest advantage."

According to the records of the A. M. A. Directory, Dr. C. died ten years ago. The next testimony by a physician in America is Dr. M., who died in 1907. Dr. S. died in 1930. Dr. G., according to our records, graduated in 1885, but the American Medical Directory has lost all contact with him. Dr. K. died in 1929;

Dr. S. died in 1913; Dr. P. died in 1936. The American Medical Directory has no record of Dr. C. R. T. but it does have a record of Dr. E. R. T., in the same town, who died in 1919. Of Dr. T. L. P. it has no record; there is a doctor from the same town with a similar name who died in 1915. Dr. L. is not a member or Fellow of the American Medical Association but is apparently still living. In other words, only one doctor of the entire group of American physicians whose testimonials are offered by the Valentine's Meat Juice Company in the year 1939 is alive. The title of the booklet is "Report From Members of the Medical Profession Who Have Themselves Taken Valentine's Meat-Juice When Ill With Gastric or Intestinal Trouble." And now they are no longer ill; they are dead. But their testimonials linger on!

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News.—The Etowah County Medical Society was addressed in Gadsden recently by Drs. James O. Finney and Amos C. Gipson on "Complications of Peptic Ulcers" and "Immunization and Treatment of Acute Infectious Diseases" respectively. At a meeting of the Calhoun County Medical Society, Anniston, recently the speakers were Drs. James A. Ward on "Obesity Associated with Endocrine Disturbances" and Hugh M. C. Linder on "Empyema Thoracis with Special Reference to the Chronic Stage." Both are from Birmingham. Dr. John Ralph Morgan, Birmingham, discussed "The Treatment of Burns" before the Walker County Medical Society October 13 in Jasper.

ARIZONA

New Office for State Society.—The Arizona State Medical Association has opened offices at 202 Security Building, Phoenix, and employed Mrs. Kitty Ives Coleman as executive secretary. For the past three and a half years the association has had a part time assistant in a combined office with the Maricopa County Medical Society and library. The president of the association held a conference of presidents and secretaries of the county medical societies at Phoenix October 22 to discuss the program of the association for the current year.

ARKANSAS

Society News.—The Ouachita County Medical Society was addressed in Camden recently by Drs. James E. Knighton Jr. on "Some Problems in Cardiology"; James C. Willis Jr. and Willis J. Taylor, "Partial Gastrectomy," and Oscar O. Jones, "Treatment of Bursitis." All are from Shreveport.

University News.—The general offices of the University of Arkansas School of Medicine, Little Rock, were moved recently to the former home of the late Dr. Carle E. Bentley, which is adjacent to the school. This property was acquired through purchase several months ago, newspapers report. Space in the medical school occupied by offices since its construction will be converted into additional quarters for the library.

CALIFORNIA

Alumni Day.—The University of California Medical School will observe its alumni day November 24. The program will consist of clinics and fracture and medical ward rounds at San Francisco Hospital. During the operations, the preoperative and postoperative care and surgical methods will be discussed by a member of the staff. There will be also a program of entertainment, according to an announcement from the university.

DISTRICT OF COLUMBIA

Personal.—Robert E. Bondy, director of disaster relief of the American Red Cross, has been appointed director of public welfare of the District. Rear Admiral Perceval S. Rossiter, U. S. N., retired, formerly surgeon general of the navy, became September 19 chief of staff at Gallinger Hospital.

The Davidson Lecture.—Dr. Walter Freeman, professor of neurology at George Washington University School of Medicine, recently presented the Davidson Lecture before the Medical Society of the District of Columbia. His subject was "The Surgery of Mental Disorder." The lecture is given biennially and is named for Dr. Edward Young Davidson. The lecturer is chosen through essays submitted on a competitive basis.

Portrait of Dr. White.—A portrait of the late Dr. William Alanson White, for many years superintendent of St. Elizabeths Hospital and professor of psychiatry at George Washington University School of Medicine, was presented to the university in behalf of the medical faculty at the opening exercises of the school September 25. Dr. Charles S. White made the presentation and Mrs. Joshua Evans Jr. accepted it for the university in behalf of the board of trustees.

FLORIDA

Personal.—Dr. Luis Garcia will be director of a new tuberculosis hospital which was to be opened about October 10 on the site of the former Pine Health tuberculosis preventorium, Tampa newspapers reported. The hospital was made possible by the cooperation of the city and county with the aid of charitable organizations. Dr. Garcia has been in charge of the Tampa tuberculosis clinic since it was opened about two years ago. Dr. William McQueen, Sarasota, has been appointed superintendent of the Sarasota Hospital.

District Meetings.—The third annual meeting of the Southeast Medical District of the Florida Medical Association was held at West Palm Beach October 12, with headquarters at the Palm Beach Yacht Club. The speakers included Drs. Eugene C. Chamberlain, Fort Lauderdale, on "Isolated Myocarditis"; Hillard W. Willis, Miami, "Nephritis in Children"; George D. Lilly, Miami, "Surgical Treatment of Essential Hypertension," and Carlos A. P. Lamar, Miami, "Clinical Endocrinology of the Male, with Especial Reference to the Male Climacteric."—The North Central Medical District Society held its third annual meeting in Ocala October 26 at the Marion Hotel. Dr. Carl S. Lytle, Dunnellon, president of the Marion County Medical Society, gave the address of welcome. Among other speakers were Drs. Ralph E. Russell, Ocala, on "Hygiene of the Eyes"; Laurie J. Arnold Jr., Lake City, "Cervical Ribs"; Richard C. Cumming, Ocala, "A Young Doctor Looks at Socialized Medicine," and Walter E. Murphy, Raiford, syphilis.

ILLINOIS

Personal.—Dr. Otto L. Bettag, White Haven, Pa., has been appointed superintendent of the Livingston County Sanatorium, Pontiac, succeeding Dr. Julius B. Stokes, resigned.

Outbreak of Typhoid.—Twelve cases of typhoid with one death occurred at DePue, Bureau County, during September, according to the *Illinois Health Messenger*. The outbreak was ascribed to a raw milk supply used by all the patients. When the supply was cut off as a control measure the epidemic ended, the *Messenger* said.

Chicago

Dr. DeLee Observes Seventieth Birthday.—Dr. Joseph B. DeLee, professor emeritus of obstetrics and gynecology, the School of Medicine of the Division of Biological Sciences, University of Chicago, observed his seventieth birthday October 29 at a party planned to benefit the Chicago Maternity Center, which he founded. He was presented with cuff links forged from a pair of forceps which he used in his early days of practice. They were the gift of the staff of the center and were presented by Dr. Beatrice E. Tucker, who directs the institution.

IOWA

Obstetric Service in the Home.—A plan is under way to provide home obstetric service to indigent patients in Polk County. The program is to be financed by funds from the state department of health and cooperating groups are the state department of health, State University of Iowa College of Medicine, Polk County board of supervisors, the city health department, public health nursing association, Polk County Emergency Relief Administration, Broadlawns Hospital, the intern committee, the superintendents of the private hospitals

and the Polk County Medical Society. The objectives are to afford obstetric service in the homes of indigent patients; to enable the college of medicine to participate in such a service and use the opportunities for teaching; to afford an opportunity for interns connected with the various accredited Des Moines private hospitals to participate in the service and to reduce the number of obstetric patients in Broadlawns Hospital, making the beds available to the more complicated and serious types of cases in which hospitalization is imperative. The home service will operate through the outpatient department at Broadlawns and patients will be investigated and arrangements made by the social service department, according to the *Bulletin* of the Des Moines Academy of Medicine and the Polk County Medical Society.

KANSAS

Changes in Health Officers.—Dr. Cyril V. Black, Pratt, has been appointed health officer of Pratt, filling the unexpired term of the late Dr. Charles E. Phillips.—Dr. Edwin O. Squire has been appointed health officer for the Coffeyville board of health.

Library and Museum of Medical History.—Space has been provided in the Hixon Laboratory of the University of Kansas School of Medicine, Kansas City, for a new library and museum of medical history. Dr. Logan Clendening, who has been conducting a course in medical history at the university for many years, gave his collection of medical curiosities and his historical library as a nucleus for the new department. The building housing the laboratory was financed by the Hixon Foundation, the PWA and gifts from Mrs. Clendening, it was stated.

KENTUCKY

Poliomyelitis in Mountain Counties.—Fifty-five cases of poliomyelitis have been reported in Floyd County and additional cases in adjoining counties, newspapers reported November 2. Most of the cases were in rural areas. The state health department and the Kentucky Crippled Children's Commission are investigating the epidemic with a view to preventing spread of the disease and instituting treatment for those stricken. Ten cases were reported in Pike County, eight in Johnson and three in Lawrence.

LOUISIANA

Society News.—At the October meeting of the Tri-Parish Medical Association, comprised of the parishes of East and West Carroll, Tensas and Madison, Dr. William K. Purks, Vicksburg, Miss., spoke on allergy.—The Eighth District Medical Society was addressed in Alexandria October 11 by Drs. Conley H. Sanford, Memphis, Tenn., on "Kidney Diseases and Hypertension"; Donovan C. Browne, New Orleans, "Functional Colitis"; and Edwin J. Kepler, Rochester, Minn., "Obesity—An Endocrine Problem."

Postgraduate Instruction.—Members of the staff of Louisiana State University Medical Center, New Orleans, are cooperating in a series of postgraduate courses being given by the division of maternal welfare of the state board of health, the federal government and the state medical society. In October Drs. Rupert E. Arnell and William F. Guerriero, clinical professor of obstetrics and gynecology and instructor in obstetrics and gynecology respectively, gave postgraduate instruction to practicing physicians in northern Louisiana. Other members of the staff later will conduct similar courses in various subjects.

MASSACHUSETTS

Public Health Meeting.—The annual meeting of the Massachusetts Public Health Association was held in Boston October 26. The program was divided into sections with a symposium making up the board of health section; the speakers were Dr. John E. Gordon, Arthur D. Weston, C.E., and Sophie C. Nelson, R.N. In the laboratory section the speakers were Donald L. Augustine, Sc.D., on "Trichinosis"; William C. Boyd, Ph.D., "Uses of Blood Grouping"; and Dr. Frank E. Barton, Boston, "Use of Placental Blood for Transfusions." The child health section devoted its session to a discussion of "The Child: The Influence of Economic Factors."

Society News.—At a special meeting of the New England Heart Association in Boston October 30 Dr. Harry E. Ungerleider and Mr. James D. Ewing, Equitable Life Assurance Society, New York, discussed "Insurance Frauds and Disability Problems in Heart Disease."—The New England Pathological Society was addressed in Boston October 19 by Drs.

Lorne M. Gray, Toronto, Ont., "Fat Embolism"; Charles E. Dunlap, on "Effect of Radiation on the Blood" and Shields Warren, "Significance of Chronic Mastitis as a Precancerous Lesion."—Dr. Vincent Gerard Ryan, who holds a fellowship in the Austen Riggs Foundation under a grant from the John and Mary R. Markle Foundation, discussed certain aspects of cases falling in the neurotic-psychotic borderline before the medical advisory board of the foundation at its annual meeting in Stockbridge October 21. Dr. Austen Fox Riggs presided at the meeting. The paper was discussed by Drs. Adolf Meyer, Baltimore; Charles Macfie Campbell and Stanley Cobb, Boston; Earl D. Bond and Kenneth E. Appel, Philadelphia, and Arthur H. Ruggles, Providence, R. I., among others.

MICHIGAN

Society News.—Dr. Carl V. Weller, Ann Arbor, gave an address before the Ingham County Medical Society October 17 entitled "Shifting Points of View in Regard to Cancer."—Dr. Harold Henderson, Detroit, addressed the Jackson County Medical Society in Jackson October 17. His subject was "The Middle Aged Woman."—Dr. Francis Bruce Fralick, Ann Arbor, discussed "Ophthalmology and Its Relation to General Health" before the Kalamazoo Academy of Medicine, Kalamazoo, October 17.

Highland Park Physicians' Club.—The fourteenth annual clinic of the Highland Park Physicians' Club was held November 15 at the Highland Park General Hospital. The program opened with a clinical pathologic conference by Dr. Edgar H. Norris, professor of pathology, Wayne University College of Medicine, Detroit. Others on the program were:

Dr. Sumner L. S. Koch, Chicago, Infections of the Hand.
Dr. Edward J. Stieglitz, Garret Park, Md., Treatment of Hypertensive Disease from an Internist's Viewpoint.
Dr. Alfred W. Adson, Rochester, Minn., Treatment of Essential Hypertension by Extensive Sympathectomy.
Dr. Edward L. Cornell, Chicago, Analgesia and Anesthesia in Obstetrics.
Dr. Allen Graham, Cleveland, Diagnostic Criteria of Cancer.
Dr. Temple S. Fay, Philadelphia, Temperature Factors in Cancer and Embryonal Cell Growth.

Medical Service for the Low Income Group.—Michigan Medical Service, a nonprofit corporation for group medical care organized under special enabling legislation sponsored by the Michigan State Medical Society, is now ready to assist the low income group in Michigan to obtain the services of doctors of medicine in return for small monthly subscription payments. The plan will be administered by a board of directors consisting of from eleven to thirty-five representatives of the public and the medical profession. Local advisory committees will be established by the medical profession so that professional judgment will guide the relations with physicians concerning participation, fees and the rendering of services. According to the November state medical journal, the articles of incorporation of Michigan Medical Service have been certified by the attorney general and the necessary working capital has been advanced by the Michigan State Medical Society. The plan will go into effect in the near future and its operation will be under the direct supervision of the state insurance department. All employed persons under the age of 65 who can be enrolled in groups of twenty-five or more will be eligible for membership.

MINNESOTA

Study of Motor Accidents.—The Minnesota State Medical Association has appointed four physicians to conduct a study of motor vehicle accidents. Drs. Kano Ikeda, St. Paul; Maurice B. Visscher, Minneapolis; Dale D. Turnacli, Minneapolis, and Edward W. Ostergren, St. Paul.

Society News.—Included among the speakers before the Hennepin County Medical Society, Minneapolis, November 6, was Dr. Horace M. Korn, Iowa City, on "Arterial Hypotension."—The Scott-Carver Medical Society was addressed October 10 in Shakopee by Drs. Arthur C. Kerkhof and O. L. Norman Nelson, both of Minneapolis, on "New Aspects of Endoscopy" and "Problems of Pernicious Anemia" respectively.

Minnesota Medical Foundation.—The establishment of the Minnesota Medical Foundation at the University of Minnesota, Minneapolis, was announced at a dinner October 13 commemorating the fiftieth anniversary of the founding of the school of medicine. The foundation has been set up by alumni of the university to establish scholarships, professorships, lectureships, research and aid to worthy students. According to the *Minneapolis Tribune*, the foundation will have the power to receive gifts, endowments, the rights to patents, trusts and property to carry out its aims. Funds derived from these sources will be used exclusively to assist university authorities.

ties in improving and enlarging the scope of their activities in medicine. Dr. Erling S. Platou, Minneapolis, president of the Minnesota General Alumni Association, is chairman of the

MISSISSIPPI

Society News.—At a meeting of the Central Medical Society in Whitfield October 3 the speakers included Drs. Ellyson G. Meriwether on "Modern Psychiatry at the Descriptive Level"; Willard L. Waldron, "Psychosis with Pellagra; Preliminary Reports of Intraspinial Treatment with Synthetic Vitamin B₁"; Victor D. Thomas, "Differential Diagnosis Between Paranoid Condition and Dementia Praecox, Paranoid Type"; Clarence H. Denner, "Some Aspects of Metrazol Therapy," and Frank A. Donaldson and F. M. Clarke, Ph.D., "Fever Therapy in Central Nervous System Syphilis."

MISSOURI

Dr. Willard Allen Appointed to Washington University.—Dr. Willard M. Allen, assistant professor of obstetrics and gynecology, University of Rochester School of Medicine, Rochester, N. Y., has been appointed professor and chairman of the department of obstetrics and gynecology at Washington University School of Medicine, St. Louis. Dr. Allen graduated at Rochester in 1932. In 1935 he won the \$1,000 Eli Lilly Award of the American Chemical Society for distinguished research in biochemistry.

NEBRASKA

Postgraduate Course in Obstetrics and Pediatrics.—A postgraduate circuit course in obstetrics and pediatrics is being presented in five towns under the auspices of the committee on maternal and child health of the Nebraska State Medical Association and the division of maternal and child health of the state health department. The series began November 6 and will continue till December 2. The lecturers, who will conduct clinics during the day and give formal lectures at night, will be Drs. Morris Edward Davis, Chicago, the first two weeks, and Henry C. Hesselstine, Chicago, the last two. Dr. Harry A. Towsley, Ann Arbor, Mich., will be the guest pediatrician. The towns in which the courses are being held are Grand Island, McCook, North Platte, Scottsbluff and Chadron.

Society News.—Dr. Elliott P. Joslin, Boston, addressed the Lancaster County Medical Society, Lincoln, October 4 on diabetes. Drs. James Dewey Bigard and Frank Lowell Dunn, Omaha, addressed the Madison Six County Medical Society, Norfolk, recently on "Treatment of Nontuberculous Suppurative Diseases of the Chest" and "Treatment of Pneumonia" respectively. At a recent meeting of the Southwestern Nebraska Medical Society in McCook the speakers, all of Denver, were Drs. Edgar W. Barber on "Medical and Surgical Treatment of Goiter"; Wilfred W. Barber, "Sulfanilamide and Sulfapyridine," and Albert W. Metcalf, who showed color films on "Vascular Diseases of the Extremities."—Dr. Harry L. Alexander, St. Louis, discussed "The Newer Aspects of Allergy," before the Omaha-Douglas County Medical Society, October 10; Dr. Maurice C. Howard presented a case report on intractable asthma.

NEW YORK

Clinical Day in Buffalo.—The Buffalo Academy of Medicine held its annual clinical day November 8 at the Hotel Statler. The scientific speakers were Drs. Emil Novak, Baltimore, on "Rational Management of the Menopause"; Donald W. Gordon Murray, Toronto, "Heparin in Thrombosis"; Charles C. Higgins, Cleveland, "Prevention of Recurrent Renal Calculus" and Russell L. Haden, Cleveland, "The Problem of Osteoarthritis." Mr. Isaac F. Marcossou, New York, was the after-dinner speaker on "War and World Chaos."

County Society Offers Health Education Service.—The Medical Society of the County of Westchester has recently made available to parent-teacher groups, service clubs, women's clubs and other lay groups a new series of educational programs. The society will prepare each month a health talk, of which copies will be sent to organizations desiring them. In addition speakers will be available through the society's speakers' bureau for more extended discussions. The society also plans active solicitation of speaking dates for members who have volunteered to speak on a wide variety of health subjects. The entire program on health education will be offered as a public service without cost to the lay groups. Dr. Edward H. Marsh, White Plains, is chairman of the public health committee which arranged the new plan.

New York City

District Meeting.—The First District Branch of the Medical Society of the State of New York held its annual meeting at the Presbyterian Hospital October 11. There were clinics on general surgery, neurosurgery, obstetrics and gynecology, general medicine, pediatrics, ophthalmology, urology and radiotherapy. Among other features was a symposium on fractures and traumatic lesions presented by Drs. William Darrach, Stephen S. Hudack, Fred M. Smith, Barbara B. Stimson, Clay Ray Murray and Harrison L. McLaughlin.

New Tuberculosis Hospital.—Mayor La Guardia laid the cornerstone of the new Triboro Hospital for Tuberculosis on Grand Central Parkway, Queens, September 28. The new hospital, scheduled for completion in April 1940, will be nine stories high. It will have a capacity of 550 beds, divided mainly into six-bed wards occupying the third to the seventh floors. All floors will have solariums, and wide use is to be made of glass, notably in partitions between wards and in the large number of outside windows. The building is financed by a city appropriation of \$1,850,569 and a PWA grant of \$1,649,431.

Annual Plastic Surgery Meeting.—The eighth annual meeting of the Society of Plastic and Reconstructive Surgery was held in New York October 27-28. Features of the program included a symposium on skin grafting by Drs. James Barrett Brown, St. Louis, and Edward A. Kitlowski, Baltimore, a session of motion picture films and clinics Saturday morning. Papers were presented by Drs. Gustave Aufricht on "Details and Technical Hints on Rhinoplasty"; Adalbert G. Bettman, Portland, Ore., "Rebuilding the Alveolar Process and the Buccal Sulcus"; Jacques W. Maliniac, "Blood Supply of the Breast," and Leon E. Sutton, Syracuse, N. Y., "The Use of Tubed Flaps for the Study of Healing in Human Skin."

NORTH CAROLINA

Health Education Project.—Stanley County has been chosen by the state board of health and the state board of education for a project in health education in public schools, the first of a program to be financed by a \$50,000 grant from the Rockefeller Foundation. The program is designed to bring about closer cooperation between the departments of health and education and will provide classroom training for pupils in hygiene and related subjects, physical education, medical supervision from the point of view of health promotion and disease prevention, and training in home, school and community sanitation. Dr. John F. Kendrick, Raleigh, has been assigned temporarily by the International Health Division of the Rockefeller Foundation to direct the project.

District Meetings.—The annual meeting of the Sixth Council District of the Medical Society of North Carolina was held September 21 in Durham. The speakers included Drs. Oren Moore, Charlotte, on "The Problem of Abortion"; Charles R. Bugg, Raleigh, "Acute Contagious Diseases of Childhood," and William M. Nicholson, Durham, "Management of the Ambulatory Diabetic."—The Ninth District Medical Society held its annual meeting in Morganton September 28 with the following speakers: Drs. Roy H. Long, Morganton, on "Metrazol in the Treatment of Mental Disease"; James W. Davis, Statesville, "Treatment of Fractures of the Hip Joint"; Samuel M. Bittinger, Black Mountain, "Surgical Treatment of Tuberculosis"; Thomas D. Sparrow, Charlotte, "Rationale of the Treatment of Goiter," and Robert A. Ross, Durham, "Problems of Late Toxemia of Pregnancy." Dr. James W. Vernon, Morganton, paid tribute to the memory of the late Dr. Edward W. Phifer, Morganton, and Dr. James K. Hall, Richmond, gave an address entitled "What Moves Man."

OHIO

Society's Lecture Program.—The Mahoning County Medical Society presented its fall lecture program October 9-11 with Dr. Charles F. Geschickter, Baltimore, as the speaker. Dr. Geschickter dealt with lesions of the skin and oral cavity, the bone, soft parts, gastrointestinal tract, thoracic cavity and the breast.

Society News.—Dr. Austin A. Hayden, Chicago, addressed the Cincinnati Academy of Otolaryngology October 23 on "Otolologists, Hearing Aids and Leagues for the Hard of Hearing."—Dr. Albert M. Snell, Rochester, Minn., addressed the Montgomery County Medical Society, Dayton, November 17 on "Treatment of Liver Disease with Special Reference to the Hemorrhagic Diathesis."

OKLAHOMA

Regional Meeting.—The Southeastern Oklahoma Medical Association held a meeting in Poteau October 24. The following speakers were on the program:

- Dr. Orville M. Woodson, Poteau, Nephropthosis.
- Dr. Sidney J. Wolfermann, Fort Smith, Ark., Diagnosis of Location of Intestinal Obstruction.
- Dr. Leonard S. Willour, McAlester, Fractures of the Pelvis and Upper End of the Femur.
- Dr. Coyne H. Campbell, Oklahoma City, Hysteria.
- Dr. Charles T. Chamberlain, Fort Smith, Vitamin Deficiency Diseases.
- Dr. Paul Neeson Rolle, Poteau, Artificial Feeding of Infants.

Annual Railway Physicians' Meeting.—The thirty-eighth annual meeting of the Frisco System Medical Association was held at Tulsa, October 23-24. Among the speakers were:

- Dr. William G. Norman, Cherryvale, Kan., Economic Problems of Modern Medical Practice.
- Dr. Harry B. Davis, Kansas City, Mo., Ocular Conditions Encountered by the Railroad Surgeon.
- Dr. Edward H. Cary, Dallas, Texas, The Use of Old Tuberculin in the Diseases of the Eye.
- Dr. William S. Horn, Fort Worth, Texas, Chronic Brucellosis as a Major Cause of Neurasthenia.
- Dr. Robert M. Howard, Oklahoma City, Toxic Goiter.
- Dr. Cyrus E. Burford, St. Louis, Injuries by External Force to Kidney, Bladder and Urethra.

PENNSYLVANIA

State to Distribute Serum and Sulfapyridine for Pneumonia.—The state department of health recently designated pneumonia control centers throughout the state from which sulfapyridine and a certain amount of serum are to be distributed free at the request of physicians for patients who are not in a position to purchase them. The centers are also equipped to give rapid and accurate bacteriologic diagnosis. Clinical reports on the results of therapy on forms supplied by the state health department are required from each physician who uses sulfapyridine or serum supplied by the department.

Society News.—Dr. Henry J. John, Cleveland, addressed the Washington County Medical Society, Washington, November 8 on diabetes.—Dr. Charles Howard Marcy, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, November 2 on pulmonary hemorrhage.—Dr. Henry L. Bockus, Philadelphia, addressed the Delaware County Medical Society, Chester, November 9 on chronic gastritis.—Dr. Katharine O'Shea Elsom, Philadelphia, addressed the Dauphin County Medical Society, Harrisburg, October 10 on "Nutritional Disturbances Incident to Vitamin B Deficiency."—Dr. Henry K. Mohler, Philadelphia, addressed the Harrisburg Academy of Medicine October 17 on "Therapeutic Uses of Sulfanilamide and Its Associated Compounds."

TENNESSEE

Clinical Congress in Chattanooga.—The Chattanooga and Hamilton County Medical Society held its annual clinical congress October 26 at Newell Sanitarium and Erlanger Hospital. Dr. Julius C. Brooks was in charge of surgical clinics and Dr. James D. L. McPheeters in charge of medical clinics. Guest speakers at a banquet in the evening were Drs. James E. Paullin, Atlanta, Ga., on "Treatment of Congestive Heart Failure" and William H. Stewart and Charles W. Breimer, New York, on "Cineeroentgenography of Today."

Society News.—Dr. Robert R. Brown addressed the Nashville Academy of Medicine and the Davidson County Medical Society October 31 on "Internal Derangements of the Knee Joints" and Dr. William C. Dixon November 7 on "Treatment of Uterine Prolapse."—Drs. Jefferson A. Hanna and William C. Chaney, Memphis, among others, addressed the Dyer, Lake and Crockett Counties Medical Society October 4 on "The Present Conception of Vitamin Therapy" and "More Recent Advances in the Treatment of Migraine" respectively.—Dr. Stewart Lawwill, Chattanooga, addressed the Chattanooga and Hamilton County Medical Society November 2 on "Intracapsular Cataract Extraction."

TEXAS

South Texas Postgraduate Meeting.—The eighth annual Postgraduate Medical Assembly of South Texas will be held in Houston December 5-7 at the Rice Hotel. The lecturers will be Drs. George G. Ornstein, Eliot Bishop, Herbert F. Traut, James W. White and Rupert Franklin Carter, New York; Henry H. Turner, Oklahoma City; Frank R. Ober, Boston; Grady E. Clay and Edgar G. Ballenger, Atlanta, Ga.; Perry G. Goldsmith, Toronto, Canada; Harold I. Lillie, Rochester, Minn.; Archibald L. Hoyne, Chicago; Hans H. F. Reese, Madison, Wis., and Isaac A. Bigger, Richmond, Va.

UTAH

State Medical Election.—Dr. Alfred C. Callister, Salt Lake City, was chosen president-elect of the Utah State Medical Association at the meeting of the house of delegates during the Rocky Mountain Medical Conference in Salt Lake City in September. Dr. George M. Fister, Ogden, became president and the following vice presidents were elected: Drs. Edwin M. Neher, Salt Lake City; Wilford J. Reichmann, St. George, and David E. Ostler, Richfield. The 1940 meeting will be in Ogden.

VERMONT

Dispensary Enlarged.—The Burlington Free Dispensary, operated jointly by the University of Vermont College of Medicine and the city of Burlington, marked the twenty-fifth anniversary of its founding by opening new and enlarged quarters. The university rented and remodeled a building and will pay the rent and maintenance, while the city contributes \$5,000 for expenses and a part of the salary of the director. The dispensary is the teaching outpatient clinic for the medical school. The new facilities include a laboratory and diagnostic appliances. In addition it is planned to add new clinics in psychiatry and venereal disease. The dispensary occupies two floors of its new building, one floor is leased to relief agencies and the upper floor has rooms for students who are on twenty-four hour duty. Dr. Jesse A. Rust Jr. is city physician and director of the dispensary.

VIRGINIA

Special Society Elections.—Several societies of specialists held their annual meetings in Richmond during the recent annual meeting of the Medical Society of Virginia. The Virginia Urological Society elected the following officers: Drs. Albert A. Creecy, Newport News, president; Samuel Beverly Cary, Roanoke, vice president, and Linwood D. Keyser, Roanoke, secretary. New officers of the Virginia Radiological Society are Drs. Fred M. Hodges, Richmond, president; Daniel D. Talley Jr., Richmond, vice president, and Vincent W. Archer, Charlottesville, secretary. The Virginia Pediatric Society elected Drs. Samuel A. Anderson Jr., Richmond, president; James V. Bickford Jr., Norfolk, vice president, and John M. Bishop, Roanoke, secretary, reelected. Dr. Harry Hudnall Ware Jr., Richmond, was elected president of the Virginia Obstetrical and Gynecological Society and Dr. Henry C. Spalding, Richmond, secretary.

WISCONSIN

Fiftieth Anniversary of County Medical Society.—The Douglas County Medical Society celebrated its fiftieth anniversary at a meeting in Superior October 4 with Dr. John Baird, the only surviving charter member, as the guest of honor. Dr. Fred G. Johnson, Iron River, councillor of the eleventh district, and several colleagues paid tribute to Dr. Baird, and the society presented to him a gold medal in recognition of his services to the society, the community and the medical profession. A volume on the history of the society, prepared by Mrs. Loran W. Beebe, Superior, was presented by the woman's auxiliary.

Society News.—Dr. Conde F. Conroy, Milwaukee, addressed the Brown-Kewaunee-Door County Medical Society, Green Bay, October 19 on management of varicose veins.—Drs. Alexander R. MacLean and John L. Emmett, Rochester, Minn., addressed the Eau Claire-Dunn-Pepin Counties Medical Society October 30 in Eau Claire on "Vascular Headache" and "Urinary Retention" respectively.—Speakers at a meeting of the Grant County Medical Society, Lancaster, October 25 were Drs. John C. Pickard, Dubuque, Iowa, on "The Ear, Nose and Throat in General Practice"; Horace Kent Tenney Jr., Madison, "Vomiting in the Newborn"; Walter C. Alvarez, Rochester, Minn., "Treatment of Indigestion," and Marcos Fernan-Nunez, Milwaukee, "Cancer—Its Prevention and Control."—Dr. William J. Bleckwenn, Madison, addressed the Green Lake-Wausau County Medical Society, Princeton, October 24 on "The Use of Barbiturates in General Practice."

WYOMING

State Medical Election.—Dr. Peter M. Schunk, Sheridan, was named president-elect of the Wyoming State Medical Society at the recent annual meeting of the house of delegates during the Rocky Mountain Medical Conference in Salt Lake City in September. Dr. Roscoe H. Reeve, Casper, was elected vice president and Dr. Marshall C. Keith, Casper, reelected secretary. Dr. John H. Goodnough, Rock Springs, became president. Next year's meeting will be in Sheridan.

GENERAL

GOVERNMENT SERVICES

Impostor Sells Surgical Supplies.—William R. Warner and Company, St. Louis, has reported an impostor said to be selling surgical supplies in Chicago under the name "Warner and Company." The man is said to be about 50 years of age and of dignified appearance. In some instances he has used the name of "Mr. Warner," according to the report. In making these alleged sales, for which he has been receiving deposits, this man uses a duplicate sales order book and a red rubber stamp "Warner and Company."

Physician in China Appeals for Medical Books.—The American Library Association has received an appeal from a physician on the staff of the Methodist Mission, Lingling, Hunan, asking for medical books. Dr. Vilma Lasser writes: "I am in great need of surgical books, especially those concerning obstetrics or treatment of tropical diseases in English, German or French. I lost all my books when the Hudson Taylor Memorial Hospital was destroyed in the great fire at Changsha in November last year." Dr. Lasser originally wrote to the American Library Association concerning books which that association is collecting for Chinese libraries, but the association states that probably little can be done through that channel.

Specialists Urge Care for Handicapped Children.—The American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago in October adopted a resolution urging that funds be provided by foundations and other appropriate agencies to give attention to children with visual, hearing and speech defects. The resolution recommended that adequate programs be instituted to detect these deficiencies which constitute an actual or threatened handicap to school children and to provide, through the cooperation of qualified specialists in national, state and local medical societies, appropriate medical care for indigent and underprivileged children who may be afflicted or threatened with such handicaps. The American Laryngological Association passed a similar resolution at its recent meeting.

Special Society Elections.—Dr. Arthur J. Schwenkenberg, Dallas, Texas, was named president-elect of the Southern Psychiatric Association at the annual meeting in Louisville, Ky., in October. Dr. William E. Gardner, Louisville, was elected vice president and Dr. Newdigate M. Owensby, Atlanta, as installed as president and Jacksonville, Fla., as installed as president for next year's meeting. Dr. Paul A. Turner, Louisville, Ky., was elected president of the Southern Tuberculosis Conference at the annual meeting in Charleston, S. C., in October. The 1940 meeting will be in Monroe, La. Dr. William B. Porter, Richmond, Va., was elected president of the American Clinical and Climatological Association at the annual meeting at Saranac Lake, N. Y., in October and Dr. Francis M. Rackemann, Boston, was reelected secretary.

Meeting of Tropical Medicine Groups.—The American Society of Tropical Medicine will hold its thirty-fifth annual meeting in conjunction with the American Academy of Tropical Medicine and the National Malaria Committee November 21-24 in Memphis, Tenn. William H. Taliaferro, Ph.D., Chicago, will deliver the fourth Charles Franklin Craig Lecture Tuesday November 21 on "The Mechanism of Acquired Immunity to Metazoal Parasites," and the Walter Reed Medal will be awarded to Dr. William B. Castle, Boston. Dr. Alfred C. Reed, San Francisco, will deliver his presidential address at the annual luncheon of the society November 23 on "The Future of Tropical Medicine." Among speakers on the program will be:

Dr. Edward B. Vedder, Washington, D. C., A Discussion of the Etiology of Sprue with a New Hypothesis.
Dr. Alvin E. Keller, Nashville, Tenn., Studies of Hookworm Disease in Six Southern States During the Period of 1930-1938.
Drs. Thomas B. Magath, Rochester, Minn., and Henry E. Melency, Nashville, Tenn., The Complement Fixation Reaction for Amebiasis.
Dr. Lowell T. Coggeshall, New York, The Selective Action of Sulfanilamide in Malaria.
Dr. Harry Most, New York, Malignant Malaria in Drug Addicts; Epidemiologic, Clinical and Laboratory Studies.

The sixth annual dinner of the American Academy of Tropical Medicine will be held Thursday evening. William W. Cort, Ph.D., Baltimore, will deliver his presidential address on "Research on Helminth Diseases and Public Health Progress" and the second award of the Theobald Smith Medal of George Washington University will be made to Dr. Richard P. Strong, Boston.

Fellowships for Women Physicians.—The Women's Medical Association of New York offers two Mary Putnam Jacobi fellowships for 1940. One of \$500, available January 1,

will be given to an American woman physician to carry on or complete some special problem in medical research. Applications must be in by December 1. In addition, the regular fellowship of \$1,000, available October 1, is open to any woman physician, American or foreign. Applications for this fellowship must be received by March 1, 1940. For both fellowships applicants must be graduates of reputable medical schools. Applications should be filed with the secretary of the committee and must be accompanied by statements as to health, educational qualifications, previous work and a proposed problem for investigation and by a photograph of the applicant. The secretary is Dr. Phebe L. Dubois, 150 East Seventy-Third Street, New York.

Southern Medical Association.—The thirty-third annual meeting of the Southern Medical Association will be held in Memphis, Tenn., November 21-24, at the Municipal Auditorium, under the presidency of Dr. Walter E. Vest, Huntington, W. Va. Tuesday November 21 will be "Memphis Day" with several clinical sessions making up the program. Dr. Rock Sleyster, Wauwatosa, Wis., President of the American Medical Association, will be among the speakers at a general session Wednesday, on "What Price Depression?" Among guest speakers at meetings of the nineteen sections will be:

Dr. Fritz B. Talbot, Boston, Present Status of the Endocrine Diseases of Childhood.
Dr. Florence Rena Sabin, Denver, Colo., Cellular Reactions to a Marked Antigen.
Dr. Henry Alsop Riley, New York, Some Observations on the Mechanism of Headache and Migraine.
Dr. Arnold D. Jackson, Madison, Wis., Surgical Treatment of Diseases of the Biliary Tract.
Dr. Ralph K. Ghormley, Rochester, Minn., Study of Acute Infectious Lesions of the Intervertebral Disks.
Dr. Charles E. Galloway, Evanston, Ill., An Evaluation of Glycocalculus.
Dr. Alexander Randall, Philadelphia, Etiology of Primary Renal Calculus.
Dr. Harry S. Gradle, Chicago, Glaucoma Errors That I Have Made and That I Have Seen.
Dr. Ernest L. Stebbins, Albany, N. Y., Recent Studies of Epidemic Diarrhea and Dysentery.

There will be a public meeting Tuesday evening with the following program:
Dr. Seale Harris, Birmingham, Vitamin Facts and Fads.
Dr. Irvin Abell, Louisville, Ky., Some of the Contributions of Medicine to Public Welfare.
Rev. Alphonse M. Schmittalla, St. Louis, Society's Debts to the Doctor.

CORRECTION

Address of Dr. G. Marshall Crawford.—In the title of the paper by Crawford and Ray in THE JOURNAL, November 4, page 1715, the address of Dr. G. Marshall Crawford should have been Boston. The error came about by changing Dr. Leon F. Ray's address from Boston to Portland, Ore., and failing to insert Boston under Dr. Crawford's name.

Government Services

Physicians Wanted in the CCC

A recent decision of the director of the CCC and the War Department permits the employment of physicians who are not medical reserve officers in this service. The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible, the physician must be legally qualified to practice medicine and physically able to perform the duties involved. No quarters are provided for families and the physician will be required to pay for his own food at camps. Temporary quarters will be provided for a nominal fee. Those selected will be required to pay for his own traveling expenses to the nearest district headquarters, where they will be put on temporary duty for instruction before being sent to camps. Traveling expenses incurred in the transfer from the district headquarters to camps or from one camp to another will be paid by the government. Physicians interested in this type of service are requested to submit their applications to the office of the Surgeon, Headquarters of the Seventh Corps Area, Federal Building, Omaha, giving date when available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas and Arkansas. Attention is directed to a change in the initial salary for physicians employed in the Civilian Conservation Corps. The salary was changed October 10 from \$2,600 per year to \$3,200.

Foreign Letters

PARIS

(From Our Regular Correspondent)

Oct. 11, 1939.

American Hospital of Paris

The American Hospital with its 500 beds, its fine equipment and its staff of physicians and selected nurses has just been placed by Dr. Gros, its superintendent, at the disposal of French war victims. Hospital services have been transferred to Etretat on the coast of Normandie, where 1,500 wounded or sick can be accommodated. On the other hand, a certain number of French hospitals have been closed, either because of the difficulty of evacuation in case of bombardment or because of the considerable reduction in the number of inhabitants of Paris in consequence of mass migrations.

Treatment of Craniocerebral War Wounds

The Académie de chirurgie held its opening fall session September 20. Gosset sent a cordial welcome with the best wishes of the members to all French and allied surgeons. He proposed a work plan and expressed the hope that the inter-allied medical conferences conducted during the World War at Val de Grâce at the initiative of Mr. Lloyd George would be revived because of their great usefulness. The principal papers of this meeting were devoted to craniocerebral wounds and their treatment and were read by Thierry de Martel, the distinguished surgeon of the American Hospital of Paris, and Clovis Vincent, professor of neurosurgery in the medical faculty of Paris. Vincent arrived at cerebral surgery by way of neurology and de Martel by way of general surgery. De Martel modestly acknowledges his indebtedness to Cushing and Mackenzie. The two papers differed on certain points but were in general agreement. For that reason they are reviewed together. A neurosurgical operation in itself constitutes a craniocerebral trauma. The physiopathologic sequels are the same and the technics of attack on the cerebral tissue are analogous. However, there is a considerable difference in the traumatic agents and likewise important differences between war wounds and ordinary traumas, such, for example, as are due to automobile accidents.

In an automobile accident, a head weighing 17.6 pounds (8 Kg.), considered as a projectile and launched at the rate of 72 kilometers an hour, on striking an object effects an impact equivalent to 160 kilogrammeters. The surface area involved is wide. In a war wound, however, caused for example by a bullet of 15 Gm. projected at 450 meters per second, the bullet attains an impact effect of 150 kilogrammeters. However, the surface involved is small. In the former case manifold lesions may be observed as well as significant concussion effects; in the latter, the lesions are concentrated and deeper; often the damage done on the surface is negligible compared with that to the nervous tissue. Today, with the progress that has been made in surgery of the cerebral tissues, one ought to bring about healing in many more cranial wounds and, above all, prevent better than was formerly possible the horrible effects which overshadowed the prognosis of those surgically cured. For that reason, speed is of utmost importance. The wounded should be brought to the surgeon before the appearance of edemas destructive to the brain, especially near the gray columns and the bulb. Early intervention prevents in the great majority of cases the principal risks of traumas and interventions, namely, hematomas, cerebral hernias or fistulas of the cerebrospinal fluid, excessive loss of bony substance and disastrous cicatrizations which affect the skin, bone and cerebral tissue and induce epilepsies and mental disorders. These benefits cannot be realized unless the surgeon

is competent and well supplied with the necessary equipment: head equipment, mechanical trephines, Cushing-Mackenzie clips, electrocoagulation apparatus of high frequency, low voltage and of weak intensity, wax to close osseous orifices, refractors, aspirators, irrigators for warm solutions, and black silk which resists decomposition. Anesthesia will be local preferably. Epileptic crises will be forestalled or managed with barbiturates, chlorol and bromides intravenously administered. Systematic roentgenography will reveal the presence of a projectile and bony splinters. A shutter will be made in the cranium according to the de Martel method, which enlarges the operative field. Its hinge will be made of muscular or aponeurotic tissue. The dura mater ought to be attached to the cranial periosteum or the deep wound portions by a fine catgut suture and its hemostasis assured by means of clips or electrocoagulation. Lesions of the cerebral tissue will then be clearly in view. Contused portions will be removed by means of scissors.

The delicate matter of hemostasis with its inundation in the absence of definite blood vessels will be managed by the aspirator. It will show the bleeding points and indicate where clips should be used or coagulation performed with low current. At times, especially if a deeply embedded bullet is to be removed, it will be necessary to make a complementary cranial shutter. On completion of hemostasis suture is made. Whenever possible, one ought to suture along the galea, because it resists cerebral pressure better than the elastic skin of the scalp. The most difficult part of this surgery seems to be hemostasis of the sinuses. It is here that experience and surgical skill will be important. According to Vincent, brain surgery is a part of general surgery and can be easily learned. There are in France quite a few capable brain surgeons, but the number of wounded may require additional specialists. Lenormant would like to see centers created for the treatment of cranial wounds and for the instruction of physicians at the front on indications for immediate action in lesions of the skull and cerebral tissue.

French Scientific Societies

Some other societies have canceled their fall meeting and among them are the Society of Dermatology and Syphilography, which was to meet in Paris October 12-14, and the cancer society scheduled for October 8.

BERLIN

(From Our Regular Correspondent)

Sept. 20, 1939.

Mothers of Large Families in Germany

In the census of 1933, restricted to Germany before its territorial conquests, were registered 3,577,000 married women, exclusive of widows and divorcées, with four or more children, which is 24.7 per cent of all married women. Of these, 1,148,000 had four children and the remaining five or more. Of the latter, 735,000 had five children, 869,000 had six or seven children and 825,000 had eight or more. In the period between the middle of 1933 and the beginning of 1939 the number of married women with four children and more decreased by 160,000 (those with four or five by 80,000; those with six or seven by 30,000 and those with eight or more by 50,000). On the other hand, the total number of married women during the same period of time increased by about 1,563,000 to a total of 16,061,000. Widows and divorced women, not included in the figures given here, with four or more children were reported at the beginning of 1933 to total 1,600,000; with four or five children 750,000, with six or seven children 400,000 and with eight or more children 450,000.

Therapy by Fasting

The Frankfurter medizinische Gesellschaft recently considered the question of fasting. H. E. Meyer first discussed the basic principles underlying the therapeutics of fasting. During

the first days of fasting, he said, a brief diminution of nitrogen excretion is followed by an increased excretory activity. Urea elimination keeps pace with the level of the total nitrogen excretion until the end of the first week of fasting. This is followed by a decrease, as part of the nitrogen is contained in the increased elimination of ammonia induced by acidosis. Very little uric acid is excreted from the time fasting is begun. Modifications of nitrogen elimination during the first week are related to the carbohydrate level. No observations were made that would indicate an increased retention of urea and uric acid before fasting therapy was initiated. There is, however, a great probability that intermediary metabolic products are excreted in increased quantities, especially during the first week. What the nature of these products is is not clear. A part of them belongs to the group which can be detected in the xanthoprotein test. Patients with high arterial blood pressure and chronic constipation show an especially high excretion of xanthoproteins. Control of oxygen eliminated shows that after an incipient deterioration of oxidation, oxidation improves more favorably than before fasting. In capillary microscopy one can clearly observe a diminution of the abnormally heightened capillary tonus. It invites the reflection that the increased elimination of intermediary metabolic products, which in turn participate in the decompensatory peripheral processes, represents a contributing cause in its favorable effect on circulatory diseases, especially in cases of high arterial blood pressure.

Changes in the metabolism of carbohydrates and fats are characterized by the sudden and marked development of acetone during the fifth and tenth day of fasting. However, an increased ketosis does not occur. Since the body manifestly adjusts itself readily to a diminution of glycogen, the elimination of acetone decreases again within a few days to an almost normal level. Feeding with grape sugar frequently demonstrates, beginning with the third week, a marked secondary hypoglycemia. The acidity crisis contributes essentially to cause a change of the organism, which change, in turn, mobilizes the defensive forces of the organism. This can be clearly seen in the heightened bactericidal power of the blood.

BELGIUM

(From Our Regular Correspondent)

Oct. 18, 1939.

Pensions for Aged Physicians

A most important corporate reform is under way, namely, the establishment of a pension system for aged physicians. The medical profession of Brussels cordially favors the idea that the directors of the Federation of Belgian Physicians follow the example set by the French, who have demonstrated what the members of a profession still entitled to be called liberal can accomplish without the support of the state. The plan is approved by the French medical syndicates, which represent four fifths of the physicians practicing in France and in the colonies. Actuarial computations are in progress. Within two years, no doubt, several thousands of aged physicians can retire and be entitled to at least a partial pension. It would be unfair to allot to them the full or normal pension in view of the fact that no assessment has been levied on them. However, they will receive about 8,000 francs if they make no contribution and 10,000 if they can contribute a small amount, equivalent to 5 per cent of 1,000 francs. The younger members of the profession will receive, at the time of retirement, from 25,000 to 29,000 francs. The highest premium will probably be 3,000 francs. Certain other risks are also taken into account, such as half pensions for widows, reimbursement for funeral expenses and special grants for physical disability.

Socialized Medicine

Before the Société médico-chirurgicale of Brabant, M. Schwes initiated a discussion on present tendencies in medical organization, championing the private character of the physician's status and practice. He asserted that private practice should remain the basis of all plans of organized medicine and that mass medicine was not feasible either from the financial or from the social point of view. The results would be disastrous. His statement evoked much criticism; although the assembly agreed that it was undesirable to see medicine converted into a state function, yet it was true that relations between medicine and the state should exist and develop. On the problem of the relation of medicine to the state, Massion presented the following point of view: The state cannot practice medicine in the current sense of the word. Freedom of choosing one's physician and the confidential character of his services must be rigorously respected in medical practice as the foundation of the healing art. The role of the state, however, is great. It must stimulate, direct and supplement, laboring to place medical service within the reach of all. The physician, while refusing to allow the fundamental character of his medical acts to be altered, ought to work in cooperation with the state for a better public health and a better medical service. An exclusively negative attitude like that of Schwes was not tenable, he said. Medicine cannot ignore the state, nor can the state divest itself of an interest in the organization and solution of the pressing problems of public health.

The New Tumor Center in Brussels

The Institute Jules Bordet, replacing the Centre des tumeurs de l'hôpital Brugmann, which had outgrown its usefulness, was recently dedicated. The building is constructed on the two wing plan. One wing, with eight stories, is intended for hospitalization; the other, six stories high, is given over to rooms and quarters for the examination of patients, for roentgenography and diagnosis, for apparatus for radium therapy, for surgical rooms and for laboratories and libraries. The eight story wing contains an auditorium and museum, administrative offices and consultation rooms for heads of departments, wards and rooms for hospital service, and the kitchen and dining rooms for the medical staff, nurses and relatives of the patients. The public aid committee has assumed the task of the construction of the building. The university has furnished the money for the acquisition of a part of the land and the x-ray, the scientific and the diagnostic equipment necessary for the treatment of cancerous patients as well as for the study and instruction of cancerology. Thanks to the National Funds for Combating Cancer, the institute has 6.5 Gm. of radium.

Scientific control will be vested in the university and hospital service in the Committee on Public Aid. The new center has been named the Jules Bordet Institute as a tribute to an eminent scientist of whom Belgium is proud.

Tuberculosis Among Workers in Tobacco Factories

Dr. Peremans reported (*Arch. de méd. soc. et d'hyg.* 1938, number 8) the results of his investigations in the Van der Elst tobacco factory at Louvain. Only workers directly in contact with tobacco were considered; these numbered 876, of whom 317 were men and 559 women. The average age was respectively 37 and 26, and the average work duration respectively eighteen and nine years. The workers examined were classified as: (1) those who had no notable pulmonary lesion, (2) those who had inactive pulmonary lesions and (3) those who had active pulmonary lesions. Cardiac and bone anomalies were also noted. Of the 317 men, twenty-four were found with active and sixty-seven with inactive pulmonary tuberculosis, twenty-four with cardiac lesions and five with bone anomalies. The figures for the women were respectively eleven, seventy, fifteen and four. Of the thirty-five suspected male and female

workers of the third group, thirty-four were given clinical tests with the following results: Active open tuberculosis appeared in two men and two women, active closed tuberculosis in eight men and four women, inactive tuberculosis in twelve men and five women and nontuberculous lesions in two men. The summarized report on the 876 workers indicated the following distribution: (1) sixteen cases (1.82 per cent) of pulmonary tuberculosis in evolution in four of which (0.45 per cent) there were open lesions, and (2) 154 cases (17 per cent) of inactive pulmonary tuberculosis. A comparison of these figures with those for other industries warrants the assumption that morbidity due to tuberculosis is practically no higher among workers in tobacco factories, on the average, than among workers in other industries.

FINLAND

(From a Special Correspondent)

Oct. 24, 1939.

Goiter as a National Problem

While goiter has been given much prominence in certain countries such as Switzerland, little is known in the outer world of the goiter problems with which Finland has to cope. Even in Finland itself there has hitherto been an inadequate appreciation of the nature and extent of these problems, and it is largely owing to the studies of Dr. Johannes Wahlberg, conducted during the past fifteen years, that a more or less comprehensive survey of the situation has now been made.

The area in which goiter is endemic corresponds almost exactly to that part which was dry mainland at the end of the ice period, when much of what is now high and dry was under the sea. In some parts, 10 per cent of the young men of military age have been found to present enlargement of the thyroid gland, and as the ratio of males to females suffering from goiter is about 1 to 5, it will be realized how prevalent this ailment is in the worst goiter districts. In the Pathological Institute in Helsingfors about 300 cases have been investigated in the course of a few years; in his clinical work, Dr. Wahlberg has dealt with 2,350 cases. The most characteristic feature of the endemic in Finland is the remarkably high frequency with which the enlargement of the thyroid is adenomatous; in the larger thyroids, adenomatous enlargements are demonstrable on palpation in about 90 per cent, and when the gland is subjected to a histologic examination it is most rare not to find any adenomatous changes.

There are still some doubts as to the wisdom of Finland following the example of Switzerland in the matter of iodine prophylaxis. May it not, it is asked, be wiser to wait and see how the Swiss, who have been given prophylactic doses of iodine throughout childhood, behave in adult life? Meanwhile, operative treatment in the most serious cases seems still to be the most effective, most economical and most speedy remedy.

The Growing Frequency of Abortions

The changed outlook from the moral and social points of view of the community in the matter of induced abortions has lately been demonstrated in a statistical study by Dr. Aulis Apajalahti of Helsingfors. His study deals with 21,007 cases of abortion admitted to the public hospitals in Helsingfors in the period 1901-1937. When the number of abortions was compared with the number of women of child-bearing age in Helsingfors it was found that the ratio of the one to the other had increased more than six times—from 1.9 to 12.5 per thousand. While the frequency of abortions has gone up by leaps and bounds, the birth rate has declined even more dramatically. For example, in the period 1907-1909, the birth rate, expressed in terms of the number of births per thousand women of child-bearing age, was 80.2. In the period 1934-1936 the corresponding figure was only 27.

Dr. Apajalahti notes that in 1936 the population of Finland was 3,807,163, and he quotes the somewhat gloomy prognostica-

tion of an unnamed statistician who has calculated that the population will never exceed 4 millions. Be this as it may, the attitude of women today toward the induction of abortion must be different from what it was only a generation ago. In the period under review, the ratio of febrile abortions in the public hospitals in Helsingfors to the total number of pregnancies has increased sixty-six times, i. e. from 0.2 to 13.5 per cent of all pregnancies. On the other hand, the ratio of afebrile abortions has in the same period increased only sevenfold, i. e. from 2.2 to 14.3 per cent. The calculation is also made that though all ages are involved in this rising tide of abortions, for the most part presumably induced, it is in the group below the age of 30 that this rise is most marked. As is to be expected, it is the unmarried woman whose pregnancies are most liable to end in induced abortions. Indeed, at the present time, the chances are that 67 per cent of the pregnancies of unmarried women will end in abortions.

Vaccination Problems

Until a few years ago Finland seemed to be immune to those sequels to vaccination which have caused great uneasiness in other European countries such as Holland and England. In 1932 the first cases of encephalitis following vaccination were reported. These cases—there were only four—were, however, enough to cause grave concern for the public health authorities already embarrassed by widespread neglect of vaccination in the country. After a careful consideration of every aspect of the subject, the public health authorities succeeded in framing a new vaccination law which came into force on Jan. 1, 1937. This law reflected recent experiences with regard to diseases of the central nervous system following vaccination, and provision was made for the wholesale vaccination of children before they reached that age at which encephalitis is most likely to follow vaccination. The law provides that children are to be vaccinated before the end of the calendar year in which they attain the age of 2 years. Neglect of this order is to be punishable. The effect of this law was a marked rise in 1937 in the number of vaccinations, which reached 162,877, or 56 per cent of all the children due to be vaccinated in that year. The corresponding percentage for 1935 was only 22.8, and for 1936 it was 33.9.

It was unfortunate that five new cases of acute disease of the central nervous system following vaccination should occur in 1937, the first year of the operation of the new vaccination law. Dr. Lars Grönlund, who has issued a special report on these five cases, has advanced a new theory as to the underlying causes of postvaccinal encephalitis. His theory hinges on the observation that in one of his cases, that of a girl aged 5 years, typical myasthenia gravis had developed at the age of 2. Dr. Grönlund suggests that the myasthenia gravis may have been a hormone-deficiency or a vitamin-deficiency disease, which lowers the resistance of the central nervous system to the usually harmless virus of vaccinia.

THE NETHERLANDS

(From Our Regular Correspondent)

Oct. 18, 1939.

Gout

Dr. Van Breemen presented a study before the *Journées Médicales de Bruxelles* on the pathology of gout in the Netherlands. From the statistical point of view the disease is rare in this country. However, the disease exhibits a powerful interest: If gout did not exist, the history of the world would have a different aspect. Gout is no longer recognized by the practitioner with the facility which formerly characterized its diagnosis. Now as formerly the pathogenesis of gout, in spite of hundreds of investigations, is unknown. Its anamnesis, habitus, articular deviations, uric acid content in the blood, tophus and roentgen aspect have their value for diagnostic pur-

poses, but in different degrees. The speaker made observations on different diagnostic facts. Various forms like rheumatoid gout, chronic gout in women and the irregular type (atypical Goldscheider type) were observed; they are more frequent in the Netherlands than the classic type.

Religious Affiliation of University Students

University statistics furnish the following data on the religious preferences of students enrolled in the different faculties and departments:

	Protes- tants	Roman Catho- lics	Jews	Orien- tals	Other Relig- ions	No Relig- ious Conne- ctions	Un- known
Theology.....	93	6.4	...	...	...	0.5	0.1
Law.....	48.1	20.7	3.9	...	0.4	26.5	0.4
Law and letters..	45.1	12.6	1	5.2	1.3	34.8	...
Medicine.....	48	17.3	3.3	0.2	0.3	30.6	0.1
Mathematics and natural sciences	46.4	13.8	3.1	0.1	0.5	36	0.1
Mathematics and letters.....	44.1	17.8	3.1	0.3	0.3	34.4	...
Philosophy and letters.....	42.2	26.6	3.9	0.2	0.4	26.3	0.4
Veterinary studies	59.8	17	1.3	0.6	0.3	21	...
Social sciences							
Amsterdam...	35.7	10.2	9.5	...	0.5	44	0.1
Rotterdam....	53.2	10.2	2.9	0.5	2.3	30.9	...
Tilburg.....	2.1	97.1	0.3	...	...	0.5	...
Delft.....	39.4	10.8	0.9	0.2	0.5	47.2	1
Wageningen...	54.4	13.3	0.9	1.2	1.1	29.1	...
Total.....	48.3	17.1	2.9	0.4	1	30	0.3
The Netherlands.	46.8	36.3	1.3	...	...	15.6	...

AUSTRALIA

(From Our Regular Correspondent)

Oct. 11, 1939.

The Biochemical Changes in Stored Blood

An attempt to obtain a more precise knowledge of the biochemical changes that take place in stored human blood has recently been made by Marjorie Biek, working at the Walter & Eliza Hall Institute, Melbourne. Seeking conditions under which blood might be stored for longer periods than has hitherto been possible, she has determined during storage the content of dextrose, urea, creatinine, nonprotein nitrogen, reduced glutathione and uric acid in whole blood and the ionic phosphate content of the plasma.

It was found possible to keep the blood from fourteen to seventeen days at 0 C. before any sign of hemolysis was observed. The onset of hemolysis appeared to be associated with two significant changes in biochemical composition, namely an increase in both the nonprotein nitrogen of the blood and the ionic phosphate content of the plasma. The dextrose content of the whole blood invariably decreased almost to zero before hemolysis began, but the artificial maintenance of a high concentration of dextrose only delayed hemolysis for a short period.

The behavior of blood stored under anaerobic conditions was also investigated. The results show that anaerobic conditions hasten the decrease of dextrose but are without effect on the development of the other changes observed.

Cells washed free from plasma with buffered saline solution, with or without the addition of dextrose, hemolyzed much more readily than did erythrocytes suspended in their own plasma, and the increase in nonprotein nitrogen was concurrently larger and more rapid. When, however, cells were washed and stored in buffered saline solution containing 8 per cent sucrose, their stability was markedly increased and the changes in the concentrations of nitrogenous constituents were slower. As the sucrose was dissolved in saline solution the erythrocytes were not agglutinated to any extent, so that any effect due to mechanical aggregation of the erythrocytes appeared to be excluded.

The very slight increase in the concentration of phosphate ions in stored plasma, compared with the high increase observed in whole blood, indicates that the ionic phosphate content has some connection with the hemolytic process.

The biochemical changes that take place do so almost entirely in the erythrocytes, but the essential nature of the process remains unknown.

Passive Immunity in Experimental Whooping Cough

Most investigators of prophylactic vaccination against whooping cough have stressed the need for some laboratory test to detect the appearance and duration of immunity. E. A. North and his colleagues working at the Commonwealth Serum Laboratories and the Children's Hospital in Melbourne have recently described methods for the demonstration of an antibody protecting mice against infection with *Haemophilus pertussis* when injected intranasally under anesthesia. This protective action, they state, is the result of the development of a specific antibacterial antibody in the serum following natural infection with *Haemophilus pertussis* or artificial immunization. The protective antibody was not present in the serums of non-immunized children who had not had whooping cough but appeared following prophylactic immunization. It was present in the serum of most adult contacts of patients with whooping cough following symptoms suggestive of mild infection but was not present in healthy young adults who had had no contact with these patients.

These workers conclude, therefore, that this antibody, demonstrable directly by the injection of mice, plays an important part in the resistance of children immune to whooping cough as the result of the natural disease or prophylactic vaccination.

Marriages

WILLIAM MORGAN FOX, Columbia, S. C., to Miss Peggy Sugg Williams of Raleigh, N. C., in Durham, N. C., September 23.

LEWIS EARL FRASER, Hiwassee Dam, N. C., to Miss Alice Jean Keith of Memphis, Tenn., at Carthage, Miss., September 2.

NICHOLAS AARON WHEELER JR., Lafayette, Ala., to Miss Caroline Carmichael in McDonough, Ga., October 5.

MALCOLM DOUGLAS HARRISON, Washington, D. C., to Miss Sadye Belle Dailey of Blanche, N. C., October 7.

PETER DARLING CRYNOCK, Morgantown, W. Va., to Miss Louella Wilson of Fairmont, November 4.

KERMIT WENDELL COVELL, Angola, Ind., to Miss Evelyn Dickson at Asheville, N. C., November 2.

MAVIS P. KELSEY, Rochester, Minn., to Miss Mary Randolph Wilson of Beaumont, Texas, September 17.

ALEX CHALMERS HOPE, Union, S. C., to Miss Virginia Nalle Campbell of Charlotte, N. C., October 5.

ROBERT MAZET JR., New York, to Miss Catharine Metz of Springfield, Ill., September 23.

LEON J. ANSON, New York, to Miss Betty H. Bowers of Johnstown, Pa., October 11.

JAMES EVERETT MOORE, Ashland, Ky., to Miss Fern Harris of Winchester, October 8.

WALTER NICKEL, Rochester, Minn., to Miss Mona O'Neil of Minneapolis, recently.

WILLIAM FITZGERALD, Chicago, to Miss Hilda Duffy of Sycamore, Ill., September 12.

JOSEPH MARCOVITCH, Dwight, Ill., to Miss Lillian Ganzer in Brooklyn, September 6.

FRANK C. HAMMOND to Mrs. Theresa A. McTurk, both of Philadelphia, recently.

PAUL DERANIAN, Indianapolis, to Miss Mary Frances Setser at Brooklyn, recently.

WILLIAM E. ABBOTT to Miss Molly Temple, both of Cleveland, September 23.

JACK HULL, Indianapolis, to Miss Princess Cogan of Peru, Ind., in September.

Deaths

Livingston Farrand ☉ Brewster, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; president from 1921 to 1937 and since 1937 president emeritus of Cornell University; instructor of psychology at his alma mater from 1893 to 1901, adjunct professor of psychology from 1901 to 1903 and professor of anthropology, 1903-1904; president of the University of Colorado, Boulder, from 1914 to 1919; treasurer of the American Public Health Association from 1912 to 1914; from 1905 to 1914 was executive secretary of the National Association for the Study and Prevention of Tuberculosis, now known as the National Tuberculosis Association, of which he was elected president in 1923; member of the Colorado State Medical Society; in 1939 chairman of the advisory committee of the American Red Cross and chairman of the central committee from 1919 to 1921; director of tuberculosis work in France of the International Health Board, Rockefeller Foundation, 1917-1918; Officer of the Legion of Honor of France; member of the board of trustees of the American Museum of Natural History; formerly chairman of the board of trustees of the Carnegie Foundation for the Advancement of Teaching, of the National Health Council, New York State Public Health Council, the special New York State Health Commission appointed in 1930 and the advisory council of the Milbank Memorial Fund; received degrees from numerous universities; author of "Basis of American History" published in 1904; editor of the *American Journal of Public Health*, 1912-1914; aged 72; member of the board of governors of the New York Hospital, where he died, November 8, of bronchopneumonia and empyema.

Robert Sonnenschein ☉ Chicago; Rush Medical College, Chicago, 1901; associate clinical professor of laryngology and otology at his alma mater since 1933; formerly professor of diseases of the ear, nose and throat at the Post Graduate Medical School; member of the American Academy of Ophthalmology and Otolaryngology, the American Laryngological Association, the American Laryngological, Rhinological and Otolological Society and the American Otological Society; fellow of the American College of Surgeons; past president of the Chicago Laryngological and Otological Society; member of the medical advisory board of the third district in Illinois during the World War; contributed a chapter on testing of hearing in Jackson and Coates's book "The Nose, Throat and Ear and Their Diseases," published in 1929, and a section on surgery of the ear in "A Text Book of Surgery" by Christopher, published in 1935; aged 60; since 1926 attending otolaryngologist to the Michael Reese Hospital, where he died, November 8, of paratyphoid infection and pneumonia.

Oscar H. Plant, Iowa City, Iowa; University of Texas School of Medicine, Galveston, 1902; professor of pharmacology at the State University of Iowa College of Medicine; instructor of physiology at the University of Texas, Galveston, 1901-1907, and assistant professor of physiology, 1907-1910; instructor of pharmacology, University of Pennsylvania, Philadelphia, 1911-1913, assistant professor of pharmacology, 1914-1918, and professor of pharmacology, 1918-1920; treasurer, 1929-1934, vice president 1935-1936, and president in 1939 of the American Society for Pharmacology and Experimental Therapeutics; in 1939 chairman of the executive committee of the Federation of American Societies for Experimental Biology; aged 64; died, October 2, of coronary sclerosis.

Charles Staples Mangum, Chapel Hill, N. C.; Jefferson Medical College of Philadelphia, 1894; member of the Medical Society of the State of North Carolina; since 1905 professor of anatomy, from 1933 to 1937 dean, from 1900 to 1905 professor of pharmacology and demonstrator of anatomy, and formerly professor of physiology and materia medica at the University of North Carolina School of Medicine; member of the American Association of Anatomists; aged 69; died, September 29, in a hospital at Durham of cirrhosis of the liver.

Louis Laval Williams ☉ Medical Director, U. S. Public Health Service, retired, Asheville, N. C.; Medical College of South Carolina, Charleston, 1880; was appointed assistant surgeon in the U. S. Public Health Service in 1885; for many years in charge of public health conditions at various immigrant stations; in 1920 was nominated by President Wilson assistant surgeon general at large; was retired in 1924; was made medical director in 1930 by an act of Congress; aged 79; died, September 17, of cerebral thrombosis.

Earl Lenwood Parmenter ☉ Lieut. Colonel, U. S. Army, retired, Mobile, Ala.; University Medical College of Kansas City, Mo., 1907; veteran of the Spanish-American and World

wars; was commissioned a major in the medical corps of the U. S. Army in 1920, and was retired for disability in line of duty Oct. 31, 1937, with rank of lieutenant; aged 59; died, August 27, in the Jackson Infirmary, Jackson, Miss., of cardiovascular disease.

John Wilson Tappan ☉ Surgeon, U. S. Public Health Service, El Paso, Texas; University of Virginia Department of Medicine, Charlottesville, 1898; entered the U. S. Public Health Service March 20, 1917, and retired Nov. 1, 1933; formerly city and county health officer; fellow of the American College of Physicians; aged 71; died, September 2, in the William Beaumont General Hospital.

Curtis Dudley Pillsbury ☉ Lieutenant Colonel, M. C., U. S. Army, Fort Crook, Neb.; University of Michigan Homeopathic Medical School, Ann Arbor, 1914; served during the World War; was commissioned a first lieutenant in the medical corps in 1917, in 1919 a major and in 1937 a lieutenant colonel; aged 50; was killed, September 29, when his car was struck by a truck.

George Arthur Neal ☉ South West Harbor, Maine; Baltimore Medical College, 1905; president and formerly secretary of the Hancock County Medical Society; for many years a member of the school board and at one time superintendent of schools; on the staff of the Mount Desert Island Hospital, Bar Harbor; aged 67; died, September 17, of angina pectoris.

John E. Douglas, Garrett, Ind.; Chicago College of Medicine and Surgery, 1913; member of the Indiana State Medical Association; assistant professor of clinical pathology at the Baylor University College of Medicine, Dallas, Texas, and pathologist of the hospital, 1929-1930; aged 52; died, September 23, of coronary thrombosis and chronic myocarditis.

Walter S. Stevens ☉ Oklahoma City; National University of Arts and Sciences Medical Department, St. Louis, 1912; at one time superintendent of the Choctaw-Chickasaw Sanatorium, Tahlequah; medical director of district number 5, Indian Service; aged 54; died, September 11, in St. Anthony Hospital of lymphatic leukemia.

Walter C. McFadden ☉ Shelbyville, Ind.; Medical College of Indiana, Indianapolis, 1902; past president of the Shelby County Tuberculosis Association; formerly secretary of the city board of health; on the staff and at one time superintendent of the W. S. Major Hospital; aged 60; died, September 30, of coronary occlusion.

James Dodd Dixon, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1902; member of the board of health of Lachine; fellow of the American College of Surgeons; surgeon to the Lachine General and St. Joseph Hospital; aged 60; died, September 27, in the Royal Victoria Hospital.

Charles Lloyd Egbert, Hastings, Neb.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Nebraska State Medical Association; medical director and superintendent of a hospital bearing his name; aged 60; died, August 26, of heart disease.

Rudolph Duenweg, Terre Haute, Ind.; University of Louisville (Ky.) Medical Department, 1913; member of the Indiana State Medical Association; fellow of the American College of Surgeons; on the staff of St. Anthony's Hospital; aged 48; died, September 24, at Culver, of coronary embolism.

Herbert Scott Pattee, Manchester, N. H.; University of Vermont College of Medicine, Burlington, 1913; member of the New Hampshire Medical Society; served during the World War; on the staffs of the Elliot and the Balch hospitals; aged 52; died, August 26, in Tilton, of coronary thrombosis.

Cecil Boner O'Brien, Greencastle, Ind.; Indiana University School of Medicine, Indianapolis, 1923; member of the Indiana State Medical Association; physician to the student health service, DePauw University; aged 42; died, September 7, in the Robert W. Long Hospital, Indianapolis.

Joseph Savage Alford ☉ Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1908; member of the Colorado State Medical Society; aged 55; died, September 23, in the Veterans Administration Facility, Sawtelle, Calif., of coronary thrombosis.

Allen Romaine Long, Buffalo; University of Buffalo School of Medicine, 1921; member of the Medical Society of the State of New York; instructor of medicine at his alma mater; on the staff of the Deaconess Hospital; aged 42; died, August 25, of myocarditis.

John Humes Barnfield ☉ Logansport, Ind.; Jefferson Medical College of Philadelphia, 1886; for many years member

of the school board; on the staff of St. Joseph Hospital; aged 75; died, September 27, in the Methodist Hospital, Indianapolis, of heart disease.

Capers Capehart Jones, Birmingham, Ala.; Philadelphia University of Medicine and Surgery, 1870; member of the Medical Association of the State of Alabama; Confederate veteran; aged 93; died, September 7, of angina pectoris and arteriosclerosis.

William E. Craig, Joplin, Mo.; University of Kansas City Medical Department, 1884; member of the Missouri State Medical Association; aged 76; on the staffs of the Freeman Hospital and St. John's Hospital, where he died, October 9, of heart disease.

Thomas Alva Strain, Meridian, Miss.; Chicago College of Medicine and Surgery, 1914; member of the Mississippi State Medical Association; served during the World War; aged 52; died, September 21, of hypertension and arteriosclerotic heart disease.

Henry Dundor Kunkel, Reading, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1929; on the staff of the Reading Hospital; aged 36; died, September 2, in Berlin, Germany, of complications following an operation for appendicitis.

Patrick H. Veach, Staunton, Ind.; Medical College of Indiana, Indianapolis, 1891; an Affiliate Fellow of the American Medical Association; formerly county coroner and member of the state legislature; aged 77; died, September 4, of cerebral hemorrhage.

James Benham Lucas, West Alexandria, Ohio; University College of Medicine, Richmond, Va., 1899; member of the Ohio State Medical Association; for many years member and president of the local board of education; aged 63; died, September 22.

Parish Stewart Smith, Conyers, Ga.; Atlanta College of Physicians and Surgeons, 1904; member of the Medical Association of Georgia; aged 62; died, September 7, in the Emory University Hospital of femoral hernia, acute appendicitis and peritonitis.

Roy Winton Johnson, Indianapolis; Northwestern University Medical School, Chicago, 1912; served during the World War; surgical adviser to the Aetna Casualty and Surety Company; aged 57; died suddenly, September 4, of coronary occlusion.

Henry D. Grady, Miami, Mo.; University of Missouri School of Medicine, Columbia, 1880; Bellevue Hospital Medical College, New York, 1881; an Affiliate Fellow of the American Medical Association; aged 83; died, September 2, of pyonephrosis.

Charles Russell Weaver, Twin Falls, Idaho; Harvard Medical School, Boston, 1925; served during the World War; formerly secretary of the Southside Medical Society; aged 42; died, September 7, in the Portland (Ore.) Medical Hospital of uremia.

James Horace Stimson Jr., Galveston, Texas; University of Tennessee College of Medicine, Memphis, 1938; on the staff of the U. S. Marine Hospital; aged 26; died, September 13, of inhalation pneumonia and burns received in an explosion on a launch.

Robert Milton Wolfe, South Norwalk, Conn.; Maryland Medical College, Baltimore, 1901; member of the Connecticut State Medical Society; at one time mayor; on the staff of the Norwalk Hospital; aged 62; died, September 26, in New York.

Walter Jones Adams, Norfolk, Va.; Medical College of Virginia, Richmond, 1895; an Affiliate Fellow of the American Medical Association; at one time acting assistant surgeon in the U. S. Public Health Service; aged 74; died, September 16.

Alfred Christopher Scaccia, Bound Brook, N. J.; University of Louisville (Ky.) School of Medicine, 1936; member of the Medical Society of New Jersey; aged 29; died, September 18, in the Neurological Institute, New York.

Harry Preston Pratt, Chicago; National Homeopathic Medical College, Chicago, 1892; Harvey Medical College, Chicago, 1896; Bennett College of Eclectic Medicine, Chicago, 1896; aged 79; died, September 14, of chronic myocarditis.

Joseph H. Bradfield, Atlanta, Ga.; Atlanta Medical College, 1893; member of the Medical Association of Georgia; formerly superintendent of the Battle Hill Sanatorium; aged 72; died, September 6, of arteriosclerosis and chronic myocarditis.

Leon Izgur, Brooklyn; Atlanta College of Physicians and Surgeons, 1913; member of the Medical Society of the State of New York; formerly superintendent of the Greenpoint Hospital; aged 55; died, September 27, of coronary thrombosis.

Frederick William McKenney, Brookline, Mass.; Tufts College Medical School, Boston, 1919; aged 45; on the staff of

St. Elizabeth's Hospital, Boston, where he died, September 11, of peritonitis following an operation for appendicitis.

William Feland Hickie, Kenedy, Texas; Hospital College of Medicine, Louisville, Ky., 1904; formerly city and county health officer; member of the state parole board; aged 66; died, September 23, in the Beeville (Texas) Hospital.

Manfred C. McNew, Ada, Okla.; Dallas (Texas) Medical College, 1902; member of the Oklahoma State Medical Association; aged 69; died, September 1, in Breco's Memorial Hospital of an overdose of morphine, self administered.

Allen Malone Kilgore, Los Angeles; Rush Medical College, Chicago, 1919; served during the World War; aged 47; died, September 25, in the Good Samaritan Hospital of injuries received in an automobile accident.

Oscar Rodney Emerson, Newport, Maine; Medical School of Maine, Portland, 1894; member of the board of registration of medicine; aged 67; died, September 27, of injuries received in an automobile accident.

Jefferson Davis Yates, Orange, Texas; Southern Medical College, Atlanta, Ga., 1895; county health officer; past president of the Orange County Medical Society; aged 78; died, September 25, in a local hospital of typhus fever.

Peter Charles Dodenhoff, Detroit; Michigan College of Medicine and Surgery, Detroit, 1901; for many years on the staff of St. Mary's Hospital; aged 60; died, September 23, of chronic myocarditis and arteriosclerosis.

Murray Emerson Reeder, Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1910; member of the Ohio State Medical Association; served during the World War; aged 52; died, September 16, of thrombosis.

George Britton Grim, Evansville, Ind.; Kentucky School of Medicine, Louisville, 1895; member of the Indiana State Medical Association; aged 72; died, September 5, in the Methodist Hospital, Indianapolis.

Merville H. Carter, Baltimore; College of Physicians and Surgeons, Baltimore, 1878; formerly member of the board of education; aged 81; died, September 5, of cerebral hemorrhage, arteriosclerosis and hypertension.

Stoddard Sprague Martin, Windsor, Vt.; Hahnemann Medical College and Hospital of Philadelphia, 1888; served during the World War; health officer; aged 72; died, September 25, of arteriosclerotic heart disease.

Leonard J. Lunsford, Montalba, Texas; Dallas (Texas) Medical College, 1904; aged 63; died, September 10, in the Missouri Pacific Lines Hospital, Palestine, of pneumonia following injuries received in a fall.

William Powell Buck Jr., Kinder, La.; University of Louisville (Ky.) School of Medicine, 1907; member of the Louisiana State Medical Society; aged 55; died, September 27, of pulmonary tuberculosis.

John F. Cardwell, Grand Rapids, Mich.; Detroit College of Medicine, 1900; member of the Michigan State Medical Society; aged 66; died, September 24, in the Sparrow Hospital, Lansing, of heart disease.

James Edward Kelly, Jersey City, N. J.; Georgetown University School of Medicine, Washington, D. C., 1925; aged 38; died, September 3, of coronary thrombosis and cardiovascular renal sclerosis.

John Lewis Rawls, Suffolk, Va.; Jefferson Medical College of Philadelphia, 1917; on the staff of the Lakeview Hospital; aged 54; died, September 12, of injuries received in an automobile accident.

William Martin Richards, New York; Bellevue Hospital Medical College, New York, 1898; served during the World War; aged 66; died, September 11, in the Neurological Institute of cerebral embolism.

Jesse Chrisman Horton, Los Angeles; College of Physicians and Surgeons, Los Angeles, 1914; served during the World War; aged 49; died, September 24, in the U. S. Naval Hospital, San Diego.

Obed Yost, Miami Beach, Fla.; Western Reserve University Medical Department, Cleveland, 1892; formerly medical referee of the Equitable Life; aged 70; was drowned, September 27, in Biscayne Bay.

Frank Paine Ramsey, East Jordan, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; aged 66; died, September 19, of carcinomatosis.

George S. Wright, Seattle; Yale University School of Medicine, New Haven, Conn., 1884; aged 78; died, September 18, in the Providence Hospital of injuries received when struck by an automobile.

Robert Lester Paxton, Lemont, Ill.; University of Illinois College of Medicine, Chicago, 1930; member of the Illinois State Medical Society; aged 35; died, September 30, of poison, self administered.

Charles Elston Phillips * Pratt, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1905; county health officer; aged 62; died, September 11, of angina pectoris.

Jenness Morrill, Falkland, N. C.; University of Maryland School of Medicine, Baltimore, 1888; aged 74; died, September 9, of chronic endocarditis, mitral insufficiency and chronic interstitial nephritis.

Morton McTyeire Moss, Bowling Green, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1894; served during the World War; aged 72; died, September 3, of Parkinson's syndrome.

Frederick Irving Brown, Los Angeles; Rush Medical College, Chicago, 1890; formerly instructor in otology at his alma mater; served during the World War; aged 70; died, September 19.

Robert L. Barclay, Kennard, Texas (licensed in Texas, under the Act of 1907); aged 60; died, September 26, in the Jim Smith Memorial Hospital, Crockett, of septicemia and pneumonia.

Samuel Jackson Redman, Dexter, Maine; Medical School of Maine, Portland, 1899; member of the Maine Medical Association; aged 70; died, September 28, of carcinoma of the esophagus.

Marion Dennis Thompson * Pamplico, S. C.; Medical College of the State of South Carolina, Charleston, 1933; aged 31; died, September 28, in the McLeod Infirmary, Florence, of pneumonia.

William Herbert Aykroyd, Toronto, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1903; Manitoba Medical College, Winnipeg, Man., 1913; aged 70; died, August 29.

John J. Stoll * Chicago; Rush Medical College, Chicago, 1885; an Affiliate Fellow of the American Medical Association; aged 78; died, September 22, of uremia and chronic glomerular nephritis.

Robert Eugene Taft * Cleveland; University of Wooster Medical Department, Cleveland, 1898; aged 73; died, September 9, at Shaker Heights of coronary occlusion and diabetes mellitus.

Thomas LeRoy Jefferson, West Palm Beach, Fla.; Meharry Medical College, Nashville, Tenn., 1892; aged 72; died, September 29, in the Pine Ridge Hospital of acute appendicitis.

John McKendree Bailey, Hopewell, Va.; Medical College of Virginia, Richmond, 1924; member of the Medical Society of Virginia; aged 40; died, September 22, of cirrhosis of the liver.

William Wells Brand, Portland, Ore.; Ensworth Medical College, St. Joseph, Mo., 1899; served during the World War; aged 66; died, August 27, of arteriosclerosis and heart disease.

Patrick F. Burke, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1894; aged 74; for many years on the staff of the Sacred Heart Hospital, where he died, September 3.

Roscoe Eugene Glass, Tampa, Fla.; Medical College of Virginia, Richmond, 1914; aged 52; died, September 25, in a local hospital of injuries received in an automobile accident.

Madge Dickson Mateer, Tsingtao, China; Homeopathic Hospital College, Cleveland, 1885; a retired medical missionary of the Presbyterian Church; aged 79; died, September 12.

John R. Perry, Marion, Ky.; Hospital College of Medicine, Louisville, 1907; member of the Kentucky State Medical Association; aged 55; died, September 26, of angina pectoris.

Benjamin F. Lyle, Cincinnati; Medical College of Ohio, Cincinnati, 1882; formerly member of the board of education; aged 78; died in September, at the Bethesda Hospital.

Nash Collins, Delhi, La.; Kentucky School of Medicine, Louisville, 1891; member of the Louisiana State Medical Society; aged 69; died, September 12, of myocarditis.

Lelia B. Higgins * Wilton, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1893; aged 79; died, August 1, of cerebral hemorrhage and myocarditis.

Clinton L. Montgomery, Blue Mound, Ill.; Rush Medical College, Chicago, 1895; served during the World War; aged 72; died, September 20, of coronary thrombosis.

Harvey Weston Turnipseed, Tchula, Miss.; University of Nashville (Tenn.) Medical Department, 1900; aged 68; died, September 16, in the Baptist Hospital, Jackson.

Tristram Bethea Hamer, Carrollton, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; aged 68; died, September 6, of cardiorenal insufficiency.

Charles Cyrus Kehl * Seattle; University of Kansas School of Medicine, Kansas City, 1920; aged 48; died, September 21, in St. Luke's Hospital of nephritis.

Isabel M. Davenport, Orlando, Fla.; Woman's Medical College, Chicago, 1891; formerly a practitioner in Chicago; aged 83; died, September 17, of heart disease.

Hiram C. Jones, Logan, W. Va.; College of Physicians and Surgeons, Baltimore, 1889; aged 78; died, September 28, in the Huntington (W. Va.) Orthopedic Hospital.

Job Nelson Statum, Birmingham, Ala.; Southern Medical College, Atlanta, 1888; served during the World War; aged 83; died, September 24, in Kessler, W. Va.

B. E. Huckabee, Birmingham, Ala.; Meharry Medical College, Nashville, Tenn., 1902; aged 75; died, September 1, of cardiac hypertrophy and chronic nephritis.

Jonathan Manning Roberts, Chicago; Columbia University College of Physicians and Surgeons, New York, 1896; aged 68; died, September 6, of chronic myocarditis.

Lewis J. Daniels, Milwaukee; Rush Medical College, Chicago, 1896; aged 65; died, September 20, at the Columbia Hospital of arteriosclerotic heart disease.

William Donaldson McNamar, Jacksonville, Fla.; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 70; died, September 18, of cerebral hemorrhage.

Isaac Clark Woodford Fling, Belpre, Ohio; University of Louisville (Ky.) Medical Department, 1907; aged 62; died, September 3, of coronary thrombosis.

William C. Mack, Indianapolis; Howard University College of Medicine, Washington, D. C., 1914; aged 53; died, September 29, of pulmonary tuberculosis.

Edward Arthur Sherlock, Los Angeles; Syracuse (N. Y.) University College of Medicine, 1921; aged 44; died in September of poison, self administered.

R. S. Pounds, Redan, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; aged 50; died in September of a self-inflicted bullet wound.

Thomas W. Henderson, Augusta, Ark. (licensed in Arkansas in 1907); aged 60; died, September 7, of chronic nephritis and cardiac hypertrophy.

George Cassell Nelson * La Harpe, Ill.; St. Louis College of Physicians and Surgeons, 1910; aged 55; died, September 21, of coronary thrombosis.

Olaf Bentzen, Miami, Fla.; Kongelige Frederiks Universitet Medisinske Fakultet, Oslo, Norway, 1893; aged 67; died, September 16, in a local hospital.

James W. Lambert, Valley Head, W. Va.; University of Louisville (Ky.) Medical Department, 1908; aged 65; died, September 4, of thrombosis.

Arthur A. McCabe, Oklahoma City; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 83; died, September 23, of cerebral hemorrhage.

Thomas J. Hackett, Houston, Texas; Meharry Medical College, Nashville, Tenn., 1913; aged 48; died, September 9, of acute glomerular nephritis.

Charles Henry Phillips Jr., St. Louis; Meharry Medical College, Nashville, Tenn., 1908; aged 57; died, September 29, of hypertensive heart disease.

Jacob Shrader Smith, Bellingham, Wash.; Louisville (Ky.) Medical College, 1898; served during the World War; aged 63; died, September 14.

Morris Schaner * Toledo, Ohio; University of Cincinnati College of Medicine, 1916; aged 50; died, September 28, of acute dilatation of the heart.

James Elliott Blakemore, Van Buren, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; aged 76; died, September 14.

Mary Roush Krieger, Cincinnati; American Eclectic Medical College, Cincinnati, 1891; aged 91; died, September 14, in the Bethesda Hospital.

Elmore Estes, Johnson City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1911; aged 61; died, September 28, in a local hospital.

Bureau of Investigation

THE MME. ADELE FRAUD

The Interesting History of Adele Millar's Quackeries

On Jan. 24, 1939, the United States mails were closed to Adele Millar, Adele Millar Prentiss and Francisca of Los Angeles and San Francisco. The case illustrates once more the futility of temporizing with quackery. The story that follows is based on (1) material in the files of the Bureau of Investigation of the American Medical Association, (2) information supplied by the Post Office Department and (3) facts released by the Federal Trade Commission.

The first record that the Bureau of Investigation has of any one known as Adele Millar appears in a clipping from the San Francisco Call of July 30, 1911. This was a column-long story of the case of a girl who, according to her friends, "was the unwitting victim of inept and bungling" work of a "beauty specialist" concern. The girl—a suicide—the story stated, was abnormally sensitive about her complexion. She went to a physician who refused to do what she asked because of the danger involved in the treatment she desired. She then went, according to the newspaper report, to the Millar Institute, whose proprietor was an Adele Millar. The result of the "treatment" she received so blotched and scarred the girl's face that she disappeared; her body was found later "cast up by the waves at Bolinas beach."

The newspaper story further stated that, coincidentally with the girl's disappearance, Adele Millar's husband gave out that his wife "had gone to Europe for an indefinite stay." The paper, on investigating, reported that the facts were that this Adele Millar had not left the state but was "sojourning incognito at a chicken ranch on the Mountain View road one mile from Petaluma." The paper added: "Her [Adele Millar's] departure for 'Europe' occurred simultaneously with the announcement of the girl's disappearance." The Bureau of Investigation has no record that any action was taken in this case.

The second record that the Bureau of Investigation has of a person of this name was a report from the Board of Medical Examiners of California stating that an Adele Millar was arrested on July 21, 1927, charged with violation of the Medical Practice Act of California. She was arraigned in Division 6, Municipal Court of Los Angeles. She pleaded guilty and was sentenced to pay a fine of \$100 or serve fifty days in the city jail. *Sentence was suspended* for two years on condition that she would not violate the State Medical Practice Act during that period.

The third record came about three years later, when Adele Millar was again arrested and arraigned on April 15, 1930, in the same court as before (Division 6, Municipal Court of Los Angeles), charged once more with violation of the Medical Practice Act. Again she pleaded guilty and was sentenced to serve sixty days in the city jail. But *sentence was suspended* for 180 days on condition that she acquaint herself with the law pertaining to her work!

The fourth record came about four years later, when a Post Office fraud order was issued Jan. 4, 1934, closing the mails to "Mme. Adele," of Los Angeles, a trade name used by Adele Millar. At this time she was selling a "Wonder Peel Paste" which she had been advertising four years previously and which contained caustics. Although she represented that her paste was harmless, the Post Office report stated that "expert medical evidence shows that the burning caused by its use is extremely dangerous and complaints in evidence show two actual instances in which death was narrowly averted as a result of such burns." In addition, Adele Millar sold "Beauty Turtle Oil," a "Developing Cream" and a so-called "Skin Tightener"—the usual armamentarium of the beauty-specialist quack. Because these were sold through the mails under fraudulent claims, the fraud order was issued. The Post Office also obtained an indictment against Adele Millar, charging her

with using the mails to defraud. She pleaded guilty and was given a *suspended sentence* of two years!

The fifth record is contained in a release issued by another government agency, the Federal Trade Commission, on March 7, 1938—about four years after the first fraud order was issued. The release read in part:

"The Federal Trade Commission has issued a complaint charging Adele Millar, 177 Post St., San Francisco, with misrepresenting the therapeutic value and merit of Wonder Peel Paste, advertised as a treatment for skin ailments and sold in interstate commerce. The respondent trades as Mme. Adele and Chez Adele."

The conclusion of the Commission's case was reported in a release it issued on July 29, 1939, reading as follows:

"The Federal Trade Commission ordered Adele Millar, trading as Mme. Adele and Chez Adele, San Francisco, to discontinue false representations in the sale and distribution of a cosmetic preparation designated "Wonder Peel Paste," or any other similar preparation.

"Under the order, the respondent is prohibited from representing that her preparation will withdraw toxins from the skin, accelerate chemical

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FRECKLES, WRINKLES, PITS, AGEING
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Advertisements (enlarged) from the Los Angeles Examiner, August 1925.

changes in the living skin cells, or supply materials to the skin to repair waste tissues; that its use will prevent or remove freckles, liver spots or wrinkles; that it will prevent or remove or have any beneficial effect in aiding in the removal of, any blemishes or other conditions of the skin which are due to or persist because of a systemic or metabolic disorder or condition; that it will prevent pimples, blackheads, puffs, scars, pits, acne or crepey neck, and that it has any beneficial effect in aiding in the removal of pimples, blackheads, puffs, scars, pits, acne or crepey neck, unless such representation is limited to those conditions which are of a surface character only.

"The respondent, now known as Adele Millar Prentiss, is also ordered to cease representing that her preparation has any beneficial effect on the metabolism or nutrition of the tissues."

The action of the Post Office Department referred to in the first paragraph of this article, closing the mails to Adele Millar, Adele Millar Prentiss and Francisca, was due to her having resumed, under these names, the mail-order sale of her Wonder Peel Paste in defiance of the original fraud order issued against her in 1934. This necessitated the issuance of the supplemental fraud order of January 1939 against the later trade names used by Adele Millar and brings the record of this

individual up to date. All of this must be very amusing to the Adele Millar organization. Certainly it reveals the inability of the authorities concerned to inhibit her activities. The long time which usually passes before the issuing of final orders by federal organizations gives many a promotor opportunity to reap the field before the storm breaks.

Correspondence

"OBSTETRIC SHOCK"

To the Editor:—Dr. Virgil H. Moon has called my attention to the fact that material from his book ("Shock and Related Capillary Phenomena," New York, Oxford University Press, 1938) was used in my article "Obstetric Shock: Its Causes, Recognition and Management" (THE JOURNAL, September 23, p. 1183) without due credit being given him. On comparison, to my utter chagrin, I find that Dr. Moon's statement is correct and I am therefore anxious to make amends for this error.

After spending some six or seven months reviewing the general subject of shock, including the few existing articles on obstetric shock, I began to write a paper in the form of an editorial for a chairman's address. Such an article could consist only of a review of the literature, with some practical considerations gleaned from a personal experience of some ten years' interest in the subject. It was a most difficult job, owing largely to the confused state of the vast literature on shock. Work piled up; "time marched on," and I deemed it necessary to obtain the assistance of a ghost writer, to whom I gave all my notes (a voluminous quantity), including an extensive bibliography and a partly written address. In due time he returned the completed article. It did not occur to me to check meticulously every statement as to authorship. I had full confidence that credit would be given wherever necessary for material used. It was not until I received Dr. Moon's letter that I appreciated the fact that my ghost writer had taken many paragraphs in toto from the final chapter of Dr. Moon's monograph, published by the Oxford University Press.

For this error of omission I offer my sincere apology to Dr. Moon and to the Oxford University Press.

HARVEY B. MATTHEWS, M.D., Brooklyn.

THE THECA INTERNA CONE: A TEST FOR FOLLICULAR GROWTH AND STIMULATION

To the Editor:—During the meeting of the American Medical Association in St. Louis and since then in meetings of medical societies all over the country, a moving picture has been shown which deals with a new gonadotropic substance recovered from the serum of pregnant mares. In this picture the development of the growing graafian follicle is shown. This part includes the "Theca Interna Cone," giving the name as such but not that of the author.

The author's name is of little importance as soon as the discovery is generally acknowledged. Until this stage is reached, the author's name should be mentioned in moving pictures, as is customary in other forms of medical publication.

My papers dealing with the growth of the graafian follicle and the causes of its ascent to the ovarian surface cover a period of sixteen years of histologic research. The pathologist Prof. Ludwig Aschoff, whose assistant I was from 1921 to 1922, told me to find out why the follicle ruptures. He anticipated that, in addition to the endocrine stimulus, there was a special anatomic mechanism, because other pathologic cystic formations of the ovary almost never rupture even when they reach the size of a man's head.

In my first paper (Why Does the Follicle Rupture? *Arch. f. Gynäk.* 119:168 [Sept.] 1923) it was shown that the dis-

tance between the follicle and the ovarian surface in human beings becomes smaller with the appearance and development of the thecal layers. At the same time it was found that there exists always an eccentric type of growing in follicles, while pathologic cystomas have a concentric way of growing. A one-sided thickness of the theca interna, rich in cells, toward the ovarian surface is present, which in larger follicles is from eight to ten times wider at the upper pole than at the lower pole toward the hilus. The theca externa, on the other hand, rich in connective tissue fibers, stays thick around the lower hemisphere and becomes thin at the upper hemisphere toward the ovarian surface, thus keeping the follicle like a goblet from expanding to any other side but the surface of the ovary. The active growth of the theca interna, which is soft, owing to its richness in fast multiplying cells, provides an area of lower resistance in direction toward the cortex and albuginea.

In a later study (Theca-Interna Cone, the Pathmaker of the Follicle, *ibid.* 158:628, 1934) it was demonstrated in human and cat ovaries that there was not only a blunt one-sided thickness of the theca interna but a wedgelike theca interna cone with a triangular outline which always points toward the nearest part of the ovarian surface. This thecal cone possesses a tropism toward the surface like the sprout of any seed and plows the path for the follicle by active infiltrating growth through the stroma and the albuginea. The follicle proper follows the line of least resistance thus provided, passively adopting frequently an elliptic or even a cone shape itself.

The theca interna cone can be demonstrated only in serial sections, perpendicular to the ovarian surface, running through the apex of the cone, as geometric considerations easily show. This must have been the reason why it has not been found before in an organ thoroughly examined by many authors for more than a hundred years.

In order to make sure that the theca interna cone was part of the normal histologic and physiologic picture of the ovary, it was necessary to prove its presence in as many mammalian species and orders as possible. This was done together with Erika von Moellendorff (The Theca Interna Cone, a Typical Structure in Growing Mammalian Follicles, *ibid.* 160:278, 1935). The theca cone could be verified in all mammalian species the ovaries of which we were able to obtain during the estrus and preestrus. In addition to *Homo sapiens* and cats, the thecal cone was found in horses, cows, swine, dogs and rabbits.

The work was completed at the Mayo Foundation and a final report, based on more than 18,000 microscopic slides, given before the staff of the Mayo Clinic (The Theca Interna Cone and Its Role in Ovulation, *Surg., Gynec. & Obst.* 67: 299 [Sept.] 1938; abstr., *Proc. Staff Meet., Mayo Clin.* 13: 443 [July 13] 1938).

The theca interna cone is found only in growing follicles. It disappears when degeneration sets in. It therefore can be used as a test for normal follicular growth and stimulation.

ERWIN O. STRASSMANN, M.D., Houston, Texas.

RABIES

To the Editor:—The report on "Rabies in Birmingham, Alabama" (Drs. G. A. Denison and J. D. Dowling, *The Journal*, July 29, p. 390) raises several questions that call for further discussion. No one should find fault with the statements of fact in their report; but it is unfortunate that some of the conclusions that they drew were published, because these have already been seized on by enemies of public health work and orthodox medical practice to cast discredit on even such rabies control measures as Drs. Denison and Dowling themselves advocate.

The authors' thesis is stated in the first paragraph of their report: "We are especially concerned with those problems

which confront the physician; namely, the value of antirabies vaccine and indication for its administration." Their intimation that "failure to control the dog" is what calls for other antirabies measures is one with which there is or should be general agreement. The factors that they mention as leading to the "indiscriminate administration of vaccine," as given in the third paragraph of their report, may also be largely accepted as widely prevalent, though the indictment suggested by the word "indiscriminate" is much too strong.

Since the thesis stresses the "problems which confront the physician," it seems strange that in the fourth paragraph of the report the prospective patient is described as being in a state of "such extreme mental anguish that nothing short of vaccine treatment can prevent nervous collapse of the individual"; and yet they go on to say that "the physician too often fails to maintain a professional attitude and allows himself to be influenced by the undue apprehension of the patient." It will surely be agreed that the public should be educated as rapidly as possible so that "undue apprehension" will more and more rarely occur, but this takes a long time, and the health officer or practicing physician who is confronted with an individual so extremely apprehensive as to be in danger of nervous collapse ought seriously to question his own wisdom and "professional attitude" if he refuses to give vaccine. Such persons very often truly believe and violently feel that it is the duty of the health department to give them the vaccine, and refusal to give it leads to loud criticism freely voiced among friends and neighbors. Facing such a situation, the health officer would injure his department vastly more in the mind of the public than he could possibly gain in any way by refusing the treatment. What the influence of such an attitude on the part of a practicing physician would be on his practice is left to the physician to judge.

As to statistical data given in the report, no question is raised; but one obvious conclusion regarding the effectiveness of canine vaccination was not drawn. If the incidence of rabies among all dogs belonging to white owners was 1.5 per cent, while the incidence among vaccinated dogs (40 per cent of the whole group) belonging to white owners was 0.5 per cent, this would indicate that about 75 per cent of vaccinated dogs were protected by the treatment.

The mortality of 0.06 per cent among 42,947 persons who received antirabies vaccine may be compared with the average mortality figure of 0.36 per cent given in League of Nations data concerning persons treated after being bitten by known rabid animals. The authors do not state the proportion of the 42,947 persons who are known to have been bitten by rabid dogs, but if it was only one in six their data would be as good evidence for the use of antirabies vaccine as are the League of Nations data.

It is difficult to see how the conclusion "The persistence with which fatalities continue to be equally distributed among the treated and untreated" can be drawn from the fact that twenty-three of the forty-eight fatal cases had received supposedly adequate treatment. Such a conclusion could logically follow only if the number of untreated persons bitten by known rabid animals was approximately equal to the number of treated persons known to have been so bitten. No definite data are given to substantiate any such assumption. Such data should not be hard to collect if they exist, for while it is never possible to obtain reports of all dog bites it is always possible to trace what happens to those people who refuse treatment after it is found that they have been bitten by known rabid dogs, which class after all is the criterion of susceptibility to rabies.

The argument based on the comparative number of deaths among Negroes and white persons from some points of view has some weight, but even here there are other variable factors that have not been taken into consideration. For instance, the

statement that "Negroes undoubtedly are bitten and otherwise exposed to rabies as often as the white persons" is an assumption not susceptible of proof from the data given; the very fact that "their animals are subject to the poorest of care" would leave the Negroes' dogs in most instances free to follow the frequently observed tendency of a rabid dog to run away from home and bite other dogs, while the well cared for dog belonging to the white family would be much more likely to be observed and handled in the early stages of the disease, resulting in bites of the owner or members of his family. It is in "caring for" his dog that the owner of a rabid animal is most often bitten.

It is claimed, therefore, that the following quoted statement is seriously open to question: "In the experiences cited there is little relation between mortality from rabies and the administration of antirabies vaccine, for (1) among the highly exposed untreated (Negro) population fatalities are no greater than among the highly exposed treated (white) population, and (2) such rare fatalities as do occur are equally distributed among the treated and the untreated."

If the authors really believe this twofold assertion, it is difficult to see why they advocate giving antirabies vaccine at all. It is indeed surprising to read through the rest of their report and find them recommending a rabies control program practically identical with that in effect in other parts of the country where rabies is a problem and to note that in Birmingham in 1938 the ratio of antirabies treatments to the number of known rabid animals was 2.9. In Los Angeles County, another rabies focus, this ratio was less than 2.0.

Some further Los Angeles County data on cases of human rabies may be of interest. In this county it is not often that a person refuses treatment after it is found that he has been bitten by a rabid dog, and the force of pound men and quarantine officers on the job do not fall far short of finding all dogs that become rabid and tracing all persons bitten by them. In a recent two year period there were five deaths from human rabies. In three of the five cases treatment was neglected, one reason being that two of the bites were not reported till the persons became ill. One of the dogs concerned was a pup which was killed by its owner after it had bitten his child. Another was not known to have bitten any other person and was never found. One bite was recognized soon after it occurred, but the person bitten was intoxicated and careless and did not heed the health department's counsel to take antirabies vaccine. In the fourth case the treatment could not be considered adequate in view of the location and type of the bite. In the fifth an adequate dosage of vaccine was given, but it was vaccine of local manufacture and not generally approved.

In passing, it should be noted that as yet no standard method of determining the potency of antirabies vaccine on the market is in effect. This defect in procedure is one that should be remedied, and until it is one may expect too frequent failures of the vaccine to protect. Even when all possible tests are made, however, we do not yet have a perfect vaccine for any disease; but this is not considered a valid argument against using vaccines.

All should certainly agree with the authors' first sentence in their conclusion: "The data presented are not of a type to warrant definite conclusions." It is to be regretted that they apparently came near reaching such conclusions, or at least expressed themselves in such a way as to put unwarranted weapons into the hands of people who delight in attacking health officers and the public health program.

J. L. POMEROY, M.D.

H. O. SWARTOUT, M.D., DR.P.H.

Los Angeles.

County Health Officer and Director of the Bureau
of Communicable Disease Control, respectively.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALLERGY TO COLD

To the Editor:—A woman aged 53 had a hysterectomy and roentgen therapy following a diagnosis of carcinoma of the cervix nine years ago. Physical examination reveals obesity, apparently from a familial trend, and blood pressure of 180 systolic and 110 diastolic but otherwise essentially normal conditions. The urine is normal and the hemoglobin is 70 per cent. She is highly nervous and requires phenobarbital to sleep. On Aug. 13, 1939, she was washing cucumbers in cold water and developed, after about ten minutes' exposure, a diffuse swelling of the hands accompanied by itching and burning. This was relieved by the injection of 0.5 cc. of a solution of epinephrine hydrochloride. On August 15, while standing outdoors in a sleeveless dress in a cool wind, she felt on itching of the flexor surfaces of the forearms and presently developed urticarial wheals in these areas. At a later date the ingestion of an ice cream cone caused gross rapid edema of the upper lip and tongue, as did contact with ice cubes in an iced drink. The application of an ice bag for nosebleed caused, in twenty minutes, edema of the eyelids and forehead to the extent that she could not open her eyes. This edema responds to epinephrine and ephedrine but the injection is followed by severe headache, presumably due to the hypertension. There is no history, either personal or familial, of allergy of any type prior to August 13. Could you offer me any suggestions or literature as to the management of such a case during the coming winter months? Her financial status would prevent the patient's removal to a warmer climate. A. H. Field, M.D., Randolph, Minn.

ANSWER.—This is an undoubted case of hypersensitiveness to cold. In addition, another type of allergy (such as food allergy) may be present. Several methods have been employed in the treatment of cold allergy. One consists simply of systematic exposure to low temperatures in order to build up tolerance. This may be accomplished by daily cold showers or baths followed by a warm shower if the reaction is undesirable. A brisk ice rub followed by treatment with a heat lamp is recommended by some (Duke, W. W.: *Physical Allergy as a Cause of Dermatoses*, *Arch. Dermat. & Syph.* 13:176 [Feb.] 1926). Another method of exposure to cold is advised by B. T. Horton and G. M. Roth (Collapse While Swimming: The Most Dangerous Consequence of Hypersensitiveness to Cold, *Proc. Staff Meet., Mayo Clin.* 12:7 [Jan. 6] 1937). It consists of immersion of a hand in water at 10 C. for one to two minutes twice daily for three or four weeks. However, this method is probably more useful in the type of cold hypersensitiveness in which constitutional histamine-like effects are prominent.

In recent years considerable attention has been given to the relationship of histamine to allergy and particularly to cold hypersensitiveness. Treatment with histamine has been recommended on the basis that the reaction phenomenon will be exhausted. Thus, G. W. Bray (A Case of Physical Allergy: A Localized and Generalized Allergic Type of Reaction to Cold, *J. Allergy* 3:367 [May] 1932) cited a case of cold allergy in a boy who was relieved by daily histamine injections beginning with 0.1 mg. and increasing to 1 mg. It is felt, however, that these doses are excessive. Horton and Roth recommended injections of histamine in doses of 0.1 mg. or less twice daily for two to three weeks.

More recently (Roth, G. M., and Horton, B. T.: Hypersensitiveness to Cold; Treatment with Histamine and Histaminase: Report of Case, *Proc. Staff Meet., Mayo Clin.* 12:129 [March 3] 1937) histaminase has been used in the treatment of cold hypersensitiveness. A dose of from 5 to 10 units three times daily, taken by mouth, is the usual procedure. The function of the histaminase is to detoxicate the excess of histamine formed in the tissues.

TUBERCULIN TREATMENT FOR TUBERCULIDS

To the Editor:—Will you please tell me the exact method of administering old tuberculin in the treatment of rosacea-like tuberculid (Lewandowsky)? I wish to start with a 1:10,000,000 dilution. M.D., New York.

ANSWER.—"Exact" is not an appropriate term for tuberculin therapy, for each physician has his own technic and each patient reacts in a different way and must be managed differently. Most users of tuberculin therapy test the sensitivity of the patient by the Mantoux intracutaneous test and begin treatment with a subcutaneous injection of an amount slightly less than that producing a reaction. Once or twice a week this dose is repeated for a few times; then, if no reaction has been caused, the amount of tuberculin is increased cautiously and

this dose is repeated several times. From 10 to 100 per cent increase is made depending on the physician's judgment of the patient's tolerance.

The patient, if ambulatory, is instructed to take his temperature three times daily and to record it and any symptom that he may notice. At the interview with his physician these data are discussed and evaluated.

It is the present practice to use sterile physiologic solution of sodium chloride for diluting tuberculin, without the addition of phenol. If sterile, the dilutions keep their strength for some time. Great care must be used in cleansing the implements in which tuberculin has been used, for a minute amount of one of the stronger solutions can alter the dose of a weak solution materially. Many workers keep special syringes and needles for the dilute solutions. These are cleansed and boiled in distilled water.

H. S. Burnell-Jones (Tuberculin in the Treatment of Cutaneous Disorders, *Brit. M. J.* 1:1212 [June 15] 1935) advises two doses a week for the first few weeks, then one a week, increasing 10 per cent when there has been no reaction. He depends on a general reaction, counting a rise of temperature to 99 F. as such. He does not approve local reactions and in order to avoid them he injects between the shoulders, where the skin is less liable than that of the arm or leg to give local reaction. He places great value on a rest period of from six to eight weeks now and then during a course of treatment, which he thinks gives the tissue cells a chance to recuperate from the repeated stimulation of tuberculin.

Other measures to increase the patient's resistance and to facilitate local healing must not be neglected. In fact, many authorities consider tuberculin an adjuvant to other therapeutic measures rather than the chief factor. For the tuberculin treatment the motto must be "Make haste slowly."

BUTADIENE, ISOPRENE AND PIPERYLENE

To the Editor:—Will you please inform me of any possible dangers of both acute and chronic forms to dolly exposure to the following volatile hydrocarbons: butadiene, isoprene, piperylene. The patient uses no masks and has come in contact with concentrated vapors of the gases for the past two years but to date has noticed only nausea after exposure.

Leon Miller, M.D., Philadelphia.

ANSWER.—At this time these chemicals are used principally in the production of plastics, synthetic rubber and rubber-like substances. The destructive distillation of natural rubber yields some isoprene. Conversely, the polymerization of isoprene may lead to a product resembling natural rubber. Butadiene, when polymerized, may furnish "Buna" rubber, likewise resembling natural rubber. All of these substances, as a result of fairly simple chemical or physical manipulations, furnish a wide variety of new compounds not all of which can be predicted. If isoprene is merely allowed to stand for a few weeks, new physical properties may arise. In the freshly prepared state, none of these three mentioned chemicals are highly toxic. All are mild narcotics. All are irritants to the mucous membranes. Such actions are acute. By way of chronic changes, emphysema may be produced. Larionov and his co-workers (*Kozanskiy med. zhur.* 30:440, 1934) found that the minimal lethal dose of butadiene for mice through the inhalation of vapors is from 200 to 300 mg. per liter of air. For isoprene, the corresponding killing dose is 140 mg. At autopsy, pathologic change was limited to the respiratory tract; no changes were associated with the heart, liver or kidneys. The physiologic properties of the polymers and compounds of these substances are little known except in the case of chlorinated butadiene (chloroprene). Von Oettingen and associates (*J. Indust. Hyg. & Toxicol.* 18:240 [April] 1936) reported toxic action of chloroprene when administered to laboratory animals. Of their subcutaneous series they stated: "The smallest dose which could be administered was 0.001 cc. per gram and this killed 100 per cent of the animals within three and one-half to four and one-half hours." By inhalation, as little as 0.3 mg. per liter was injurious. The pathologic features disclosed included pulmonary irritation, pulmonary edema, cardiac impairment, dilated visceral blood vessels, gastro-enteritis, nephritis, cutaneous irritation and loss of hair. These severe manifestations are to be associated with the introduction of the chlorine ion rather than with the butadiene nucleus itself, since the earlier cited data indicate a far lower toxicity for the unchlorinated substance.

While it is possible to rate the substances mentioned in the query as of a comparatively low order of toxicity, they are not wholly inert and the guiding data are meager. For the time being, at least, exposure to high concentrations of vapors should be avoided.

QUERIES AND MINOR NOTES

1901

DIFFERENTIAL DIAGNOSIS OF ASCITES

To the Editor:—A 34 year old colored man, apparently in good health, bent down while working and when he suddenly straightened up felt "something snap" in his abdomen in the midline below the umbilicus. There was no pain. About six hours later his abdomen was distended, and it remained so for three months, till operation, except for some lessening of distention by the use of salyrgan. There was some pain in the right lower quadrant, the cause of which was diagnosed in office fluoroscopy as a ruptured muscle. His only other symptoms were some frequency and urgency. Physical examination showed negative except for rounded abdomen, which had all the characteristics of ascites. There were a positive Wassermann reaction, negative spinal fluid examination and negative blood count and blood chemistry; gastric analysis showed free hydrochloric acid of 50 and total acidity of 63; urinalysis showed occasional pus cells; x-ray examination showed all organs to be in good condition and an extraordinarily well developed abdominal musculature. There was no mention of the fluid withdrawn, and a tentative diagnosis of tuberculous peritonitis and syphilitic crisis was made. Can you tell me what relationship there could be between the "injury" and the sudden development of ascites? Is there such an entity as syphilitic peritonitis? Could the syphilis have been aggravated to cause ascites by virtue of hepatic cirrhosis? Can you give me any other possible diagnosis?

ANSWER.—This question involves the differential diagnosis of ascites. It is assumed that the exploratory laparotomy demonstrated that the distention was due to ascites, although the question does not so state. Among the common causes of ascites are circulatory disturbances, renal disease, hepatic obstruction, leukemia, Hodgkin's disease, neoplasm and tuberculous. Syphilis as a rule causes ascites only by producing a perilepatitis or other hepatic obstruction. This and hepatic obstruction for other causes seem ruled out by the statement that "exploratory operation showed all organs to be in good condition." The same statement fairly well rules out abdominal neoplasm with ascites. Circulatory failure is incompatible with the history, and renal or blood disease does not fit in with the laboratory observations. Hodgkin's disease seems unlikely but should be kept in mind.

To correlate the sudden appearance of ascites with the injury is a difficult problem. It must be remembered that from 1.5 to 2 liters of fluid may be present in the peritoneal cavity without physical signs and that from 4 to 5 liters will cause no great distention. It is difficult to imagine what sort of "injury" could cause the accumulation of more than 5 liters of fluid within six hours and leave no traces that could be found at exploratory laparotomy three months later. It seems much more likely that fluid was already present in the abdomen at the time of the "injury." Indeed, the sensation that "something snapped" may have been a sudden shift of the fluid from one portion of the abdomen to another. Tuberculous peritonitis seems to be the most likely diagnosis. An x-ray examination to investigate the possibility of pulmonary tuberculosis would be helpful. The injection of some of the fluid into a guinea pig might easily settle the question.

TOPICAL ANESTHETICS

To the Editor:—Will you kindly send me information concerning so-called topical anesthetics? I have read conflicting statements concerning ethyl aminobenzoate U. S. P. (benzocaine), for example, as to its efficacy in relieving painful superficial burns. There are several preparations which are claimed to have a local anesthetic effect in the relief of superficial burns and localized pruritus. Which of the anesthetics used are most effective on cutaneous surfaces, and are these absolutely nontoxic and safe to use over a large area, even in young children?

M.D., New York.

ANSWER.—There is no absolutely nontoxic and safe topical anesthetic. Ethyl aminobenzoate (benzocaine) was discovered before orthoform but did not come into prominence until the dangers inherent in the use of orthoform had become known. L. Schwarzschild (Sensibilisierungs Versuche aus der Orthoform Reihe, *Arch. f. Dermat. u. Syph.* 156:432, 1928) reported two cases of severe dermatitis due to ethyl aminobenzoate (anesthetin) in 1928. His study of the sensitizations produced by members of this group of drugs convinced him that these effects were caused by certain chemical subgroups. M. H. Goodman (Cutaneous Hypersensitivity to the Procaine Anesthetics, *J. Invest. Dermat.* 2:53 [April] 1939), as a result of his recent investigations, comes to the same conclusion. Butesin picrate in ointment form is widely used in the treatment of burns and is a common cause of dermatitis which may become much more disabling than the original burn is not the only harm that such drugs may do. Bernard Fantus and H. A. Dyniewicz (Compound Solution of Tannic Acid, *THE JOURNAL*, July 17, 1937, p. 200) warn against the use of the tannic acid treatment for small burns because of the damage done to skin

cells and the resultant delay in healing. They state that the tannic acid method is applicable only to large burns that threaten serious systemic effects. The soothing effect of protection from the air, such as can be produced by covering the area with melted sterile paraffin, is usually sufficient without the use of local anesthetics. If not, it may be preferable to use a general sedative rather than a local one.

Most of the topical anesthetics are effective only on surfaces from which the epithelium has been removed. Béla Freystadt (Experimenteller Nachweis der Penetrationsfähigkeit einiger Oberflächenanästhetika durch die unverschrte Haut, *Dermat. Wchnschr.* 106:73 [Jan. 15] 1938) after extensive experimentation found that pantocain in ointment will penetrate the unbroken skin and cause anesthesia, but only after hours of application. He also found that the repeated use of these ointments caused dermatitis. Phenol in 2 per cent water solution for cold but only slightly for touch and having no effect on the feeling for pain or warmth. Solutions of phenol in alcohol, glycerin or oil were much less effective. Tricresol, a 2.5 per cent solution in water, was less active than the phenol solution in water, and 10 per cent alcoholic solution of beta-naphthol, salicylic acid, guaiacol and resorcin had less effect, decreasing in the order in which they are named. Since phenol, even 1.5 per cent watery solution applied as a wet dressing, is credited with causing gangrene, most dermatologists do not use it any stronger than 0.5 per cent in water and 1 per cent in the other solvents. Sensitization to phenol is much less common than is that to the more complex drugs previously discussed.

DIAGNOSIS AND TREATMENT OF NERVE INJURY

To the Editor:—I have a case of radial and ulnar nerve injury of the left forearm and hand region with what is apparently physiologic solution of continuity without anatomic interruption of the nerve pathways. It is desirable to study the reaction of degeneration in the involved muscles in order to throw light both on exact diagnosis and on prognosis. Please comment on the efficacy of electrical stimulation of the involved muscles of the forearm as a therapeutic measure. Can you advise me concerning the purchase of an apparatus which will supply galvanic and faradic current and cathode and anode opening and closing currents?

M.D., Ohio.

ANSWER.—In the study of paralyzed muscles one requires only a source of galvanic and faradic currents. Such an apparatus can be purchased from several firms which deal in electrical supplies. If the nerve is completely degenerated, one will obtain no reaction to faradism from the nerve or muscle, and the galvanic reaction of the muscle will be slow and well sustained. If there is no degeneration of the nerve, both faradic and galvanic stimuli will give prompt contraction when applied to the muscle and to the nerve. If the nerve is not degenerated, one expects a prompt and complete recovery in most cases. If it is degenerated, improvement will be slower and usually stops short of complete recovery, since many regenerating axons go astray and exercise no useful function. Electrical stimulation has little if any therapeutic value in cases of peripheral nerve paralysis. Denervated muscles should be placed at rest in splints in such a position as to secure relaxation. Stretching and probably contraction of denervated muscles cause serious injury to the muscle fibers and at least delay recovery. The principles of treatment are identical with those employed in the treatment of cases of infantile paralysis.

LACQUER THINNERS

To the Editor:—I should appreciate information concerning the ingredients of and the toxicity of "Qualolac Thinner No. 631." This product is manufactured by the Qualolac Products, Inc., 21 Gay Street, New York City. It is used as a varnish thinner by furniture manufacturers.

M.D., New Jersey

ANSWER.—At the present time, two types of thinners enjoy wide use for general coating purposes. The best thinners consist chiefly of toluene or xylene or mixtures of the two, together with either hydrogenated naphthas or natural petroleum fractions closely similar to the hydrogenated naphthas. A second class of thinners, and that most likely to be used with lacquers and on most furniture, contains in addition to the substances mentioned such materials as butyl acetate, isopropyl acetate, butyl alcohol, ethyl alcohol or closely related substances in the same series. In addition, special thinners may contain small quantities of antiblooming agents, turpentine, benzene and the like. These statements, both as to constituents and toxicity, apply to thinners in general and to no specific product. All these substances possess some degree of toxicity. Benzene, if present, is the most toxic of the possibilities mentioned.

Toluene is less dangerous than benzene, but this is due partly to its higher boiling point. Butyl alcohol is more dangerous than ethyl alcohol, although the ethyl alcohol may be denatured with 5 per cent methyl alcohol. Full information does not exist with regard to the toxicity of hydrogenated naphtha, and at the present time it is customarily classed as of the same order of toxicity as petroleum naphtha. Some claims have been made that hydrogenated naphtha may contain up to 18 per cent of cyclic compounds. To the extent that this is true, hydrogenated naphtha is to be respected more than naphtha. The acetates represent the constituents of least toxicity but are capable nevertheless of inducing mild conjunctivitis, respiratory irritation and similar abnormality. Thinners of almost any type are capable of inducing dermatitis, either through direct irritation or fat removal. It is always desirable that no workroom atmosphere contain high concentrations of the vapors of thinners. In coating operations, exhaust systems are customarily desirable or necessary, and in addition in some workplaces respirators or helmets may be found in use.

SULFANILAMIDE, NICOTINIC ACID AND METHYLENE BLUE

To the Editor:—My experience with the use of large doses of sulfanilamide is confined principally to the treatment of gonorrhea. Some of my patients have complained of shortness of breath on exertion (due to methemoglobinemia?). Hartmann advises from 1 to 2 grain (0.065 to 0.13 Gm.) doses of methylene blue every fourth hour for the prevention of methemoglobinemia. Not all observers agree that cyanosis and methemoglobinemia are associated; in addition, methylene blue tends to cause nausea but may be given in enteric coated capsules. There are also a few observers who do not believe that sodium bicarbonate is necessary. Finally nicotinic acid seems to be of distinct value. At this rate I would want to give my patients (a) sulfanilamide, (b) nicotinic acid, (c) sodium bicarbonate and (d) methylene blue. If such a scheme is followed, would it be desirable from the standpoint of possible incompatibility to space these drugs, say, one drug every hour; or is there no incompatibility?

M.D., Pennsylvania.

ANSWER.—No evidence is available on which to base an opinion as to whether or not incompatibility would develop from the simultaneous administration of sulfanilamide, nicotinic acid, sodium bicarbonate and methylene blue. In considering the combination of sulfanilamide and methylene blue it might be well to review the work which has been done on relieving cyanotic symptoms originating from sulfanilamide therapy by methylene blue (*J. Clin. Investigation* 17:699 [Nov.] 1938; 18:179 [March] 1939). The rationality of adding nicotinic acid and sodium bicarbonate at the same time is not experimentally and clinically established. It would seem better that the drugs, if indicated, be given concurrently.

DEATH OF EPILEPTIC PATIENT FROM LOCAL ANESTHESIA

To the Editor:—A white man aged 32, in excellent physical condition with the exception of existing epilepsy, was prepared for a hemorrhoidectomy. The surgeon used what he considered 1½ ounces of 2 per cent procaine hydrochloride prepared by a graduate nurse. One cc. of a solution of epinephrine hydrochloride was added to the procaine hydrochloride before infiltration of the hemorrhoidal area. Just as the surgeon commenced to remove the first hemorrhoid, the patient complained of nervousness, developed a horizontal nystagmus, had five convulsions (clonic type) one after the other and died on the table. The cause was considered respiratory, the breath becoming progressively weaker in spite of the use of artificial respiration. The patient was treated with phenobarbital, receiving one 1½ grain (0.1 Gm.) tablet daily, and had on an average from two to five seizures a month but never status epilepticus. The head and upper extremities were violaceous after death. Investigation revealed that the nurse had made up 45 cc. of 2 per cent pontocaine hydrochloride solution in place of 2 per cent procaine hydrochloride, and this was used for infiltration. Would you consider the pontocaine hydrochloride the primary cause of death?

M.D.

ANSWER.—The symptoms preceding death are characteristic of the effects of cocaine derivatives on the central nervous system. They occur when the quantity of solution exceeds the limit of safety, when the concentration of the drug is too high or when an inadvertent intravenous injection has been made. In this case, 45 cc. of a 2 per cent procaine hydrochloride solution might well be too high a concentration to use for infiltration anesthesia; if the solution injected was pontocaine hydrochloride in the same concentration, this far exceeds the limit of safety, as pontocaine hydrochloride is used in 1:1,000 to 1:500 dilutions for infiltration. The correspondent does not mention the concentration of the pontocaine hydrochloride solution.

It is usually considered unwise to operate on epileptic patients under local anesthesia, as they may develop convulsions on the operating table unless they are well premedicated with barbit-

urates or bromides. As the convulsions due to an overdose of the local anesthetic are due to cortical irritation, it is conceivable that the brain of an epileptic patient may be more sensitive to such intoxication than a normal brain; however, death here occurred almost certainly as a result of too much of the anesthetic or because of an intravenous injection. The latter may cause fatality in comparatively small doses.

XEROSTOMIA

To the Editor:—A woman aged 65 who is generally much debilitated has chronic gallbladder disease and is suffering greatly from xerostomia (dry mouth). The tongue is quite red and beefy in appearance, the lips are cracked, and voice production or articulation is difficult owing to a dryness felt in the esophagus and mouth. The blood picture is normal. I have been giving large doses of liver (Reticulogen Lilly) intramuscularly, 1 cc. weekly for four weeks, without any relief. Her general physical condition is decidedly under par. There is moderate arteriosclerosis with a mild hypertension. The nose and throat are otherwise negative. She has both upper and lower dental plates. Stomach analysis shows acidity. Therapy other than liver has included brewers' yeast tablets, diluted hydrochloric acid and moderate doses of digitalis for tachycardia. Any information you can give as to relief of dry mouth will be greatly appreciated.

M.D., Westmoreland, Kan.

ANSWER.—Xerostomia, or deficient salivary secretion, is an accompaniment of diabetes mellitus, diabetes insipidus, belladonna poisoning, severe fevers and nephritis. All dehydrated states are affected to a certain extent. While the condition is rather rare, all too often no assignable cause is demonstrable. In the absence of a specific cause, symptomatic treatment is resorted to with indifferent results. Glycerin mouth washes give some relief. Small doses of pilocarpine sometimes stimulate salivary secretion.

To discuss the possible causes of the fissured lips and the red tongue, apart from xerostomia, would carry the discussion from such local causes as eczema oris through a tremendous number of conditions up to a general nutritional deficiency such as pellagra or sprue. In the case cited, liver extract will not do much in the presence of a normal blood picture. Digitalis is usually ineffective in tachycardia that is not associated with heart failure. Anacidity is not uncommon at age 65 and hydrochloric acid may give symptomatic relief. Brewers' yeast may be useful.

A most careful search for a local or systemic cause should be pursued. If such search proves fruitless local treatment, unsatisfactory as it is, must be kept up.

GASTROINTESTINAL MELANOMAS

To the Editor:—Are melanomas ever primary in the gastrointestinal tract? How commonly are melanomas found in the gastrointestinal tract? How commonly are melanomas a cause of intestinal obstruction?

M.D., New York.

ANSWER.—Melanomas can be primary in the gastrointestinal tract. They occur almost exclusively in the rectum. According to Ewing (*Neoplastic Diseases*, ed. 3, Philadelphia, W. B. Saunders Company, 1928, p. 935) they constitute about 2 to 3 per cent of all melanomas. Of 266 malignant melanomas reviewed by Affleck (*Am. J. Cancer* 27:120 [May] 1936), only one such lesion was found in the mouth and in the rectum, respectively. Gerritzen (*Arch. f. klin. Chir.* 178:400 [Dec. 15] 1933) stated that seventy-two cases of primary melanoma of the rectum were reported up to 1934. Forty-eight of these actually were primary melanomas of the rectal mucous membrane, whereas the remaining twenty-four consisted of primary melanocarcinoma of the anus and melanocarcinoma. This author added an additional case of rectal melanocarcinoma to those already reported. Such tumors are found less frequently in the intestine and occasionally in the gallbladder, bile ducts, esophagus and mouth. Of course, in the presence of all melanomas situated in the last-mentioned sites, the question always arises as to whether they are primary or secondary manifestations. Melanomas are infrequently a cause of intestinal obstruction, partly because of their comparative rarity and partly because the majority of them are situated in the rectum. In a case of multiple primary melanomas of the small intestine reported by Menne and Beeman (*Am. J. Digest. Dis. & Nutrition* 3:786 [Dec.] 1936) there was no clinical evidence of obstruction prior to the operation. Maxwell (*M. J. Australia* 2:656 [Nov. 24] 1928) reported a case in which chronic intestinal obstruction and intussusception were the results of secondary melanomas of the small intestine.

An adequate bibliography may be compiled from the references to the literature in the textbook or in the articles of the authors cited.

QUERIES AND MINOR NOTES

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PUPILLARY ATONY WITHOUT SYPHILIS

To the Editor:—An examination of a veteran airline pilot reveals abnormal pupillary responses in that the pupils react sluggishly to light. Under strong light stimulation the pupils contract from 7 mm. to 4 mm. In the act of accommodation the pupils contract properly. Complete neurologic studies, including an examination of the blood and spinal fluid, yielded negative results. This pilot, at the end of frequent long flights and for a long period, has used a proprietary eye wash to relieve symptoms of mild eye irritation. The manufacturers of the eye preparation state: "This is a neutral and isotonic solution of boric acid and borax, containing 0.4 per cent antipyrine for its slightly anesthetic effect (see Sollmann, 'Manual of Pharmacology,' 5th ed., Saunders); small quantities of cherry laurel water and sodium salicylate are added as perfuming and preserving agents." Would a preparation such as this give false impressions as to pupillary responses?

Ralph Greene, M.D., Coral Gables, Fla.

ANSWER.—It seems unlikely that the use of the proprietary wash mentioned could have any influence on the normal pupillary action. However, it is barely possible that the pilot may be unduly susceptible to the influence of antipyrine, which is known to diminish muscular contractility (Bastedo, W. H.: *Materia Medica, Pharmacology, Therapeutics and Prescription Writing*, Philadelphia, The C. B. Saunders Company, 1937). It is more probable that this comes under the heading that Behr describes as "reflektorische Pupillenstarre bei nicht metakinetischen Erkrankungen" (pupillary atony without metasyphilitic disease). See Behr, C. J. P.: *Die Pupille in Hermann and Wilbrand, Saenger: Neurologie des Auges, Ergänzungs Band*, pages 181-197. It must be remembered also that the pupillary responsiveness to light is lost only gradually in syphilis.

AN INJECTION METHOD FOR VARICOSE VEINS

To the Editor:—In the three volume work entitled "Post-Graduate Surgery," edited by Rodney Maingot, there is a discussion of the injection treatment of varicose veins. A technic called "twin injections" is described in which quinine-urethane and a solution called lithocaine are injected simultaneously. Lithocaine is described as lithium salicylate 30 per cent, tutocain 1 per cent. Will you please tell me whether any one else has used these substances with the same degree of success as Maingot and, if they are used with the described consistently superior results, where they may be purchased?

M.D., Texas.

ANSWER.—The twin injection method of Maingot and Harvey has been used in several thousand cases by the authors, who reported no unpleasant sequelae and no pain. It seems unnecessarily complicated and requires two operators. No further reports in the literature are available. The solution could be made up by any chemical supply house; tutocain, a derivative of procaine hydrochloride, is not a harmless drug when injected intravenously.

HEMORRHOIDS IN INFANT

To the Editor:—Please advise me of the proper treatment of hemorrhoids in an infant aged 1 year. This child until recently had a persistent constipation and her stool was always large and hard. At the age of 9 months she had an anal fissure which lasted several weeks, after which a single hemorrhoid developed. At present she is having a daily bowel movement and takes liquid petrolatum daily. In spite of this the first portion of each stool is large, hard and inspissated. However, the mechanical action of the liquid petrolatum enables its passage without pain. Would you advise substitution of some hydrophilic substance for the oil?

M.D., Michigan.

ANSWER.—Hemorrhoids in an infant of 1 year practically never require surgical treatment. Constipation should be relieved and the stool kept soft and lubricated so as to avoid pain and irritation of the hemorrhoid on passage. Liquid petrolatum given daily usually suffices to accomplish this. If it does not there is no harm in using liquid petrolatum suspension. The diet should also be so arranged as to avoid constipation, i. e., with sufficient fruits, vegetables and laxative carbohydrates such as honey, lactose baby jams or corn syrups.

OSTEOMYELITIS IN MILKER

To the Editor:—Is there any danger in employing a farmhand who has a chronic osteomyelitis of the lower part of the leg to milk cows? Is there much likelihood that the organisms producing the osteomyelitis will produce intestinal or other symptoms if the milk is contaminated?

M.D., New York.

ANSWER.—It is probable that the danger of contamination of milk by a farmhand with chronic osteomyelitis of the lower part of the leg who is milking cows is fairly remote. Nevertheless, the possibility does exist that organisms from the infection might gain access to the milk. Furthermore, such organisms could produce intestinal or other symptoms if the milk was contaminated with them.

Practically, milk ordinances in general do not prohibit milking by a person with such an infection. If the milk so produced is not to be pasteurized, it would probably be better to prohibit milking by this man. He certainly should not be allowed to milk cows for the production of milk which is to be distributed raw.

PLASTIC SURGERY OF FACE

To the Editor:—I should like to buy a profilometer used or devised by Josephs, of Berlin, for measuring the profile of the nose in relation to the face. I have tried every store in New York without success. Would you please advise me where I can obtain this instrument and other plastic instruments for nose plastic work. Would you advise me whether there are any new books on plastic surgery.

M.D., Pennsylvania.

ANSWER.—A description of Dr. Joseph Safan's profilometer is found in his book "Rhinoplastic Surgery"; Dr. Safan was a student of Josephs. This has never been put on the market; one could have it made. Dr. C. L. Straith in Detroit uses one which could be duplicated. A celluloid triangle of 30 degrees held in such a way that one may view the profile is the simplest of all these. Dr. Ferris Smith, Grand Rapids, Mich.; Dr. Earl C. Padgett, Kansas City, Mo.; Dr. Joseph Safan, Dr. Arthur J. Barsky and Dr. J. Eastman Sheehan, New York, and Dr. Edmund B. Spaeth, Philadelphia, are among those who have recently written treatises on plastic surgery.

HERNIA IN INFANT

To the Editor:—At what age would you advise operation on an infant with an indirect inguinal hernia that goes into the scrotum when the baby cries? He has had this hernia since the age of 6 months and is now 1½ years old. A well fitted truss has not helped the situation, although he has been wearing one for the past six months. Also please give me your opinion on the injection, or sclerosing, method of treating a hernia in an infant of this age.

C. A. Eisner, M.D., Pittsburgh.

ANSWER.—Except in case of strangulation or incarceration it is a wise policy to postpone operation for hernia in an infant until he has reached the age of about 2 years, first because (1) the structures have by that time become well enough developed to make operation simple and easy and (2) before that period a baby ordinarily has not acquired habits of cleanliness and therefore the likelihood of infection of the wound has to be seriously considered. In the specific case referred to, operation had best be done even though the child has not reached the age of 2 years. The technic of procedure in an infant requires only the complete removal of the sac, and no repair of the inguinal canal is necessary. There is little, if any, likelihood of recurrence if this simple technic is carried out. This procedure has been tried much more often than the injection method of treatment.

NAUSEA FROM EPHEDRINE

To the Editor:—What is the best way of combating the complication of nausea induced by the use of compounds of ephedrine in the treatment of bronchial asthma?

Howard B. Brown, M.D., Springfield, Mass.

ANSWER.—The nausea which occasionally accompanies the use of ephedrine compounds in full therapeutic doses is due to its local irritant action on the gastric mucosa. This occurs in only a relatively small number of persons. It has been stated that asthmatic patients seem to be more susceptible to the local irritant action of ephedrine compounds. The sulfate may be less irritant than the hydrochloride and should be used when there is any question of local irritability. An enteric coating may be tried to obviate the gastric irritation. In some cases the use of small amounts of barbitol or its derivatives or, still better, of brometone has given relief. The brometone may be given with the ephedrine. And finally the use of a solution of sodium bromide in rather small doses has been of benefit in cases such as described.

ANTIEMETIC POTENCY OF LIVER

To the Editor:—Referring to the inquiry concerning the comparative antiemetic potency of calf's liver and lamb's liver (*The Journal*, August 5, p. 530) I wish to advise that I have prepared and tested liver extract prepared separately from beef liver, pork liver, lamb liver and salmon liver. I was unable to detect any great difference in the antiemetic potency of the extracts prepared from the three mammals. I had considerable difficulty in extracting the fish liver and can only state that the extract as finally obtained was much less active, in the neighborhood of 50 per cent.

Guy W. Clark, Ph.D., Pearl River, N. Y.

Book Notices

Training for Championship Athletics. By C. Ward Crampton, M.D. Cloth. Price, \$2.50. Pp. 303, with 7 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1939.

As the title suggests, Dr. Crampton's book is designed primarily to attract and interest boys and young men. It should do both. The author is well qualified by long experience as an athlete, teacher of athletes and physician to athletes to write of the making of athletes. He does it brightly and effectively, with real analytic ability. So well is the job done that it should make helpful reading for others than prospective athletes, particularly coaches and physical education teachers. In content the volume presents general material on training for various athletic activities, growth, development and diet, much of it made spicy and interesting by being directly connected with prominent athletes such as Bob Feller and Glenn Cunningham. The styles, habits and training methods of a number of such athletes are discussed in a way to stimulate and intrigue the average boy. The latter part of the book is devoted to more specific and detailed matters of diet and technique for various sports. Included are sprinting, mile running, pitching, batting, basketball and fundamentals of football. There are many helpful illustrations from photographs of great athletes and the type is large enough to be easily readable.

Medicolegal Phases of Occupational Diseases: An Outline of Theory and Practice. By C. O. Sappington, A.B., M.D., Dr.P.H. Cloth. Price, \$2.75. Pp. 405, with 7 illustrations. Chicago: Industrial Health Book Company, 1939.

Extension of workmen's compensation to include indemnification for disability arising from occupational disease is of comparatively recent origin. Nevertheless there are sound indications already that this development has come to be a major preoccupation in the field of medical jurisprudence. Even a satisfactory definition of what constitutes an occupational disease is extraordinarily hard to reach. When one adds to that fundamental difficulty the associated problems of etiology, disability rating and adjudication, the whole picture becomes one of fascinating complexity. In the construction of a work on occupational disease compensation, therefore, there is at once the necessity of picking out and emphasizing those principles which have received the imprint of judicial and authoritative interpretation. In these respects the author has succeeded admirably. The subject matter, all closely constructed after the handbook style, is treated under four major headings: industry, insurance, medicine and law. The first section deals largely with lists and classifications of industrial hazards. There are also chapters on detection and control from the engineering standpoint which will be of interest to physicians not entirely aware of the considerable advances being made along these lines. The section on insurance testifies for the most part that successful principles for underwriting this type of risk are by no means settled. Past experience in compensating for industrial injuries, valuable as it has been, will provide only a partial solution to the perplexing problems of disability arising out of occupational disease. The economic and social impacts of this movement, especially the medical contribution and particularly past relationships which have existed between medicine and insurance in the casualty fields, are evidently outside the scope of this book. The chapters devoted to medical considerations concern themselves with classifications of exposures according to cause and part affected. Throughout this discussion the need for thorough study of etiology is constantly underlined. Disability estimation largely follows Kessler's previous work. There are only brief references to medical treatment, which because of its unsatisfactory character should occupy a secondary position to preventive principles. The legal section receives the most extensive consideration. There are tables on incidence collected from the few states that publish data on closed occupational disease claims. The controversial details of blanket versus schedule coverage are presented as well as the merits and disadvantages of court procedure, industrial commission

practice and the use of medical advisory boards. An appendix contains digests of workmen's compensation laws affecting occupational diseases and also abstracts of court decisions which will be interesting to physicians who have had contact with legal procedure in sufficient degree to allow for proper appraisal.

Urine: Examination and Clinical Interpretation. By C. E. Dukes, M.Sc., M.D., D.P.H., Pathologist to St. Peter's Hospital for Stone and Other Diseases of the Urinary Organs, London. Cloth. Price, \$8. Pp. 403, with 110 illustrations. New York, Toronto & London: Oxford University Press, 1939.

As stated in the foreword, the author has attempted to collect methods of laboratory procedure for investigations on the urine useful in clinical practice. He has devoted much space to the clinical interpretation of these laboratory results. This experience has been gained as a result of ten years' service as clinical pathologist to a hospital majoring in the care of patients with urinary tract diseases. The volume is well printed on good paper, adequately indexed and contains excellent photographs, some of which are presented as colored plates. Many references to original articles are given and the volume should serve as an excellent guide to laboratory workers. Errors in proof reading are nil, although on page 21 hippuric acid is referred to as a conjugated product of benzoic acid and glycerin. However, this compound is described correctly later. The book is stronger in the section devoted to microscopic and bacteriologic technics than to the chemical procedures.

Many essential chemical procedures, at least so regarded in the United States, have been omitted. Some of these omissions might be cited. Better tests for the recognition of bile salts utilizing the Pettenkofer reaction are available than those given. In the determination of the p_n value of urine, no mention is made of the quinhydrone or glass electrode methods, although the quinhydrone method is of quite common use since the apparatus is economical, accurate in the range of urine, and avoids the pitfalls of the colorimetric procedures in a solution such as urine, which may be at times highly colored. It would seem that qualitative tests for the presence of urea in urine are superfluous and should not be emphasized. The hypobromite method has been almost entirely replaced in this country by the urease procedure. No mention is made of boric acid as an absorbent for ammonia in the aeration procedure for determining urea, although this absorbent is commonly used and obviates the necessity of one standard solution. Only the Benedict uric acid method is given and no reference is made to the direct procedure. Similarly, the excellent method of Sullivan for recognition of cystine is omitted. This method serves admirably for identifying cystinuria as well as the recognition of cystine calculi.

The chapter devoted to hormone assay is a welcome addition to a modern reference work, but here again there is a lack of procedures which are now recognized as useful clinically. No test is described for the determination of the corpus luteum hormone as it is excreted in the urine as pregnandiol glucuronate. The Oesting chemical method for determining androgen is not given nor is there any mention of the lactogenic hormone.

To workers in other countries it would seem that the metric system of measurement should be followed completely. Body weights would not then be referred to as so many stone, such as is given in the section devoted to vitamin C. Chemical tests for vitamins B₁ and B₂ are not presented even though this determination is at present on a quite quantitative basis. The Koppanyi test for barbiturates in the section on recognition of poisons is not included, although it would seem that this method offers the best quantitative technic for the determination of this group of substances.

There is an extended chapter on urinary calculi with excellent illustrations and undue detail for one who is interested in the laboratory angle solely. Usually the pathologist is interested mainly in the type of calculus that is present in order to give the clinician information on which to base therapeutic procedure. The determination of the type of calculus is a simple accomplishment and can be done following the procedure given by the author. However, acetic acid is usually

the acid of choice in the differential acidification for the recognition of calcium phosphate and calcium oxalate.

Essentially this volume offers much of value to the laboratory technician and to the general practitioner by presenting in a simple manner laboratory urinary technic in a concise form.

Die Tuberkulose als Allgemein-Krankheit. Von Dr. G. Liebermeister, Leiter der Inneren Abteilung des Städtischen Krankenhauses Düren. Nr. 72, Tuberkulose-Bibliothek, Beihette zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Paper. Price, 12 marks. Pp. 108, with 23 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

This small volume will be of interest to the specialist in tuberculosis but of less concern to the general practitioner and specialist in other diseases, in spite of the fact emphasized by the author, to which exception cannot be taken, that the general manifestations of tuberculosis are such that internists, pediatricians, surgeons and physicians in the specialties should be familiar with them. Liebermeister's book represents a mixture of clear summarizing of accepted facts and an attempt to explain them in a complicated way that will seem unnecessarily confusing to all not versed in the varying terminology built around the phenomenon of allergy. Clinicians with long experience in tuberculosis, in turn, are apt to take frequent exception to the rather glib explanations of variation in the course of tuberculosis in terms of energy, dysergy and nomerger and to feel that commonly the course does not conform with the diagrams in the text intended to illustrate stages of the disease. Specialists in tuberculosis, however, will find the author's conceptions stimulating in directing attention to the relations of allergy and illness.

Hygiene. By J. R. Currie, M.A., M.D., D.P.H., Henry Meehan Professor of Public Health, University of Glasgow, Glasgow. Cloth. Price, \$5. Pp. 324, with 34 illustrations. Baltimore: William Wood & Company, 1938.

This textbook on hygiene is described by the author as intended for the use of students of medicine, priority being given to the social aspect of hygiene. Although Currie states that he does not elaborate the administrative and legal points of hygiene, one third of the book describes rather fully the provisions in Great Britain for medical and public health care, including maternal and child welfare, school hygiene, mental hygiene and industrial hygiene. One chapter is devoted to a discussion of social insurance as it is employed in Great Britain. This discussion is largely an enumeration of the laws which have been passed and the benefits available to individual citizens without any opinions being given with regard to the effectiveness of such legislation. The remainder of the volume takes up various aspects of personal and environmental hygiene, such as food, ventilation, lighting, water supply and waste disposal, and gives a rather detailed treatment of the individual infectious diseases. This book should serve the purpose for which it is written, that is, as a textbook on hygiene for medical students in Great Britain. Because much of the material is concerned with specific legislation and practices in that country, its chief value in the United States will be as a reference book for those wishing to get information on practices in Great Britain.

Les troubles de la thermorégulation (coup de chaleur). Par L. Déröbert. Paper. Price, 60 francs. Pp. 218, with 13 illustrations. Paris: Masson & Cie, 1939.

This work is an experimental study the purpose of which is to determine the pathology of the clinical group of symptoms known as heat stroke. Two thirds of the monograph consists of a survey of the literature that the author considers has a bearing on the subject. Although there are twenty-five pages of bibliography, the American work on the subject is incomplete and most of the authors mentioned in the text cannot be found in it. The author exposed dogs, rabbits and guinea pigs to high humidity and temperatures ranging from 40 to 45 C. (104 to 113 F.), studied the clinical effects and examined them post mortem. The first group of animals died in from thirty-five to seventy-five minutes. The second group also exposed to high humidity and to lower temperatures, 32 to 35 C. (89.6 to 95 F.), survived. The physical and clinical changes were noted and they were later examined pathologically. The final group consisted of a case of heat stroke and

one of severe burns in human beings. Descriptions with illustrations of the morphologic changes in the blood cells were given and some measurements of the chemical constituents of the blood recorded. The author concludes that "elevated temperature on one part of the body or on the whole body is capable of causing benign symptoms (syncope and collapse) or serious symptoms (properly known as heat stroke) the cause of which is disintegration of the albumins. . . . Although this disintegration is important, the marked increase of 'albumoses' causes lesions as important as those found in anaphylactic shock. These 'albumoses' can cause the same lesions in an organism previously sensitized even though it is not specific, or in an organism in which the antitoxic barriers are deficient. . . . This produces a disintegration of the first importance in which the polypeptides cause lesions of the vegetative centers, which in their turn are responsible for changes in the organ as a whole." The evidence cited for these conclusions is inconclusive. The relation of the metabolism of water and the electrolytes to shock might have been discussed with advantage.

M One Thousand Autobiographical Sonnets. By Merrill Moore. Cloth. Price, \$5. Pp. 1,000. New York: Harcourt, Brace & Company, 1938.

This book is cleverly titled with the metric symbol for a thousand, which happens also to be the author's initials. It contains 1,000 sonnets of 50,000 which he has written, though he pledges himself that most of the rest will not be published. These sonnets are in many different forms. A considerable number present the traditional octet and sextet of the established form for this poetic medium. Others are differently divided, one for example consisting of couplet, triolet couplet and triolet quatrain, with the second line of the latter broken in two. There are others in two stanzas of seven lines, some in three-five-three and three, and still others in five-two-two and one. The rhythm is as causal and irregular as the stanza divisions. Lines are frequently broken in the middle. Rhymes appear or are ignored, at the author's pleasure. The sonnets are said to be autobiographic, but the reader would have difficulty recognizing this fact if his attention were not called to it by the introductory statement. The work does show strongly the influence of his medical training and his interest in psychiatry, since many of his sonnets deal with medical matters, as, for example, "There Was A Man":

. . . He was born in Wurttemberg,
Came to America at twenty, never married,
Never missed operas, and always tarried
Before antique shop windows and before
Shops where meerschaum objects and where amber
Were displayed, and never spoke English well,
And got along very quietly till he fell
And broke his hip.
Pneumonia ended his life
In Bellevue neatly stretched between two sheets
By crevasses and canyons that were streets.

Other sonnets deal with the psychology of deafness, "Ambulance Call," and a satire on the gyrations of the bald entitled "Too Late for Herpicide." A whole division is devoted to dreams and symbols and in this is included a tricky "Sonnet in Code" and one composed almost exclusively of Pullman names and other words. There is such endless variety of form and topic in this book that should make it provocative and stimulating reading for one who can pick it up and read it by snatches. In fact, the reviewer is not inclined to hold the author to his promise of nonpublication of the rest of his work, or at least a portion of it.

Short Stature and Height Increase. By C. J. Gerlling. Cloth. Price, \$3. Pp. 159, with illustrations. New York: Harvest House, 1939.

The title is intriguing but may lead the man of short stature, to whom this book is addressed, to expect far more than the author can deliver. The author does not promise in the various chapters to increase the height of the individual but points out the various factors that may produce an illusion of increased height. The book is interestingly and simply written and presents the various factors responsible for growth. Inheritance, the mechanism of growth and all the factors as glands, food, sleep, age and disease are discussed in their relationship to growth. The author then tells of the folly of using highly advertised self-prescribed drugs and devices to bring about an

increase in height. There is a brief but excellent discussion of the little faith that should be placed on weight tables based on age and height. The main thesis of the book is that posture is the best and surest aid for those of short stature. It can bring about an actual increase in height only so far as the person has allowed himself to assume a slouch. The benefits of exercise to increase the tone of the muscles responsible for good posture may result in better health and a better appearance and with it a better outlook on life. The chapter on stature aids is of interest in that it discusses shoes and clothing and the part they play in producing illusions of greater height. It is a book that the practicing physician may want to recommend to his patients whose short statures are keeping them from a normal, cheerful outlook on life.

Life and Letters of Dr. William Beaumont. By Jesse S. Myer, A.B., M.D. With an introduction by Sir William Osler, Bt., M.D., F.R.S. Second edition. Cloth. Price, \$5. Pp. 327, with illustrations. St. Louis: C. V. Mosby Company, 1939.

Here is a new printing of the famous book by Myer first published in 1912. It still bears the introduction which Dr. William Osler wrote at that time. The name of Beaumont is almost supreme among workers in the field of physiology in this country as our greatest pioneer. At the meeting of the International Congress of Physiologists in Boston in 1929, William Beaumont was figuratively canonized as the Patron Saint of American Physiology. In a new introduction by Dr. A. C. Ivy there is an analysis of present day points of view in relationship to Beaumont's experiments. The present volume contains a reproduction of the fine painting made by Dean Cornwell in 1938 and is otherwise similar to the edition published in 1912. This book is a "must" item for every American physician interested in medical history.

Otolaryngology in General Practice. By Lyman G. Richards, M.D., Associate Professor of Otolaryngology, Tufts Medical School, Boston. With a foreword by D. Harold Walker, M.D., Consultant in Otolaryngology, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts. Cloth. Price, \$6. Pp. 332, with 72 illustrations. New York: Macmillan Company, 1939.

This textbook on otolaryngology for use by the general practitioner accomplishes its purpose in an admirable way. The author discusses the most common diseases and complaints which the general practitioner is called on to take care of in everyday practice. The impression one gets on reading the book is that here are the opinions of a person of experience, unmarked by strong personal bias and characterized by a great deal of good common sense. The author has not described in great detail operations which the general practitioner has no right to do and which he is not called on to do. The one operation on which time is spent is that of tonsillectomy and adenoidectomy, and this is eminently proper because, regardless of contrary opinion, most of the tonsillectomies in this country are being done by nonspecialists. The general practitioner interested in diseases of the ear, nose and throat can gain much by a careful reading of the text.

Headache and Head Pains: A Ready Reference Manual for Physicians. By Walton Forest Dutton, M.D., Director, Medical Research Laboratories, Amarillo, Texas. Cloth. Price, \$4.50. Pp. 301, with 6 illustrations. Philadelphia: F. A. Davis Company, 1939.

Headache is a symptom which may occur with almost any disease affecting the human body. To attempt to give a differential diagnosis of headache with treatment would involve a complete knowledge of all phases of medicine. One volume, as one can readily see, would be quite inadequate. The introduction deals with the neurophysiology, etiology, analysis of causal factors and discussion, including history and method, for relief of pain. This part in itself, although superficial, is fairly well written. Opium is mentioned as the most important analgesic, a statement with which the reviewer would not agree. The rest of the book deals with diseases causing headache and their treatment. This is arranged alphabetically instead of in order of their importance. Such a common condition as sinus disease is given two pages and so is the rare condition actinomycosis. Brain tumor is said to be a common disease, which is an erroneous statement; opium derivatives are prescribed, which are actually contraindicated in most

cranioerebral diseases and injuries. Functional disturbances are erroneously handled only with drugs. Although the book has a few good prescriptions, the reviewer can see no value for even the layman and certainly not for the practitioner or specialist.

Index-Catalogue of the Library of the Surgeon General's Office, United States Army (Army Medical Library). Authors and Subjects. Fourth Series. Vol. IV: Daac-Dzionara. [Including] Specimen Pages from a Bio-Bibliography of XVI. Century Medical Authors [and a] First Addition to the Reference List of Congresses. Cloth. Price, \$2. Pp. 756. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

The fourth volume of the fourth series of the Index Catalogue of the Surgeon-General's Office covers the letter D. The Surgeon-General's Library now contains approximately 409,223 volumes, 377 pamphlets and almost 200,000 theses. About 18,000 new items are added to the library each year. Recently the subscriptions of the library have been extended by some 200 new medical journals, of which approximately 50 per cent are South American and 15 per cent from soviet Russia. This work has long been known as a competent index to the material that it covers. In the current issue the headings dementia, dentistry, digestive tract, disability and drugs as well as dermatitis, diabetes, diarrhea and diet indicate the importance of the letter D in any medical classification.

Pratsi y materiali pershogo Kharkivskogo Derzhavnogo Medichnogo Institutu. Vidpovidalnyi redaktor: A. Gasparyan. Vypusk X: Organogumoralna regulatsiya i aktivni metodi likuvannya. Chastina 1: Giperatsidni gastriti. [Works and Materials of First State Medical Institute of Kharkov. Volume X: Organohumoral Regulation and Active Methods of Treatment. Part 1: Hyperacid Gastritis.] Cloth. Price, 5 krb. Pp. 128, with illustrations. Kiev: Derzhavne medichno vidavnistvo, 1938.

This small volume of papers from the department of internal medicine headed by Prof. A. P. Korkhov of Kiev deals with acid gastritis. Korkhov develops the thesis that a number of diseases of the liver, stomach, duodenum and biliary tracts have for their basis a shift to acidosis in the blood and tissues. He therefore advocates in the treatment of acid gastritis and gastric ulceration, besides the rest and the diet, alkalization of the organism by administration of sodium bicarbonate and magnesium carbonate in the proportion of 4:1 based on consideration of the determined physicochemical indexes of the urine, the blood and the gastric juice. The text is in Ukrainian, with a summary in Russian and in French.

A Survey of Child Psychiatry Contributed by Contemporary British Authorities. Edited on behalf of the Child Guidance Council by R. G. Gordon, M.D., D.Sc., F.R.C.P., Medical Director Child Guidance Council. Cloth. Price, \$3.50. Pp. 278. New York & London: Oxford University Press, 1939.

Here a number of prominent British writers discuss child psychiatry under the special headings of physical illness, mental illness, sociologic aspects and special syndromes. The latter concern chiefly enuresis, stammering, sleep disorders, ties and sexual difficulties. A book of this type indicates how far we have advanced in our study of the child since the leaders of medical and social science began to give these problems special attention. It is interesting to know that the Commonwealth Fund of America aided in setting up a demonstration clinic in London and was really responsible for introducing the whole field of child guidance into Great Britain. The competent articles here presented are an indication of the great advancement that has been made.

Evaluation of the Industrial Hygiene Problems of Illinois. Prepared by Division of Industrial Hygiene. State of Illinois, Department of Public Health, A. C. Baxter, M.D., Director. Paper. Pp. 258. Chicago, Illinois, 1939.

A series of industrial hygiene surveys have been conducted by divisions of industrial hygiene in state health departments operating under plans and instructions originally devised by the United States Public Health Service. As a result the publications of the individual bureaus of industrial hygiene take on aspects of uniformity which, in the event of subsequent compilations on a countrywide basis, will provide data of inestimable value. Even if such were not the case, a review of the industrial hygiene problem in Illinois because of the variety of its manufacturing processes takes on aspects of

importance which transcend mere local interest. In this instance the great number of tables which list the major exposures of all the principal occupations occurring in the state and the percentage of workers exposed to specified materials in those occupations make it in many respects the most useful of the state reports yet published. The compilers of this report consider it merely a statistical presentation. It is likely that a future publication will present an industrial hygiene program for the state based on this preliminary fact finding investigation.

The International Medical Annual: A Year Book of Treatment and Practitioner's Index. Edited by H. Letheby Tidy, M.A., M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc. Fifty-Seventh Year, 1939. Cloth. Price, \$6. Pp. 602, with 196 illustrations. Baltimore: William Wood & Company, 1939.

This volume is now in its fifty-seventh year. A considerable number of British physicians cooperate in producing the book, which resembles the American Year Book series except for the fact that here everything is in one volume. There is an extensive index and the book is beautifully illustrated. Each of the articles concerned is supplemented with a suitable bibliography. Practically all the articles concern papers published during 1937 and 1938.

Gastrointestinal Dysfunction. By Barton Arthur Rhinehart, A.B., M.D., Associate Professor of Roentgenology, University of Arkansas School of Medicine, Little Rock. Cloth. Price, \$6. Pp. 311, with 48 plates. Little Rock, Arkansas: Central Printing Company, 1939.

This is a comprehensive title, but the student or physician who hopes to discover in this volume a comprehensive treatise dealing in detail with the many and varied types of functional disorders of the digestive tract will meet with disappointment. It is not a textbook. The author states on the flyleaf: "This book is dedicated to the proposition that nutritional deficiencies cause the majority of the gastrointestinal disorders of civilization" and he attempts to promulgate this highly debatable theory by assembling a great and extremely heterogeneous mass of material quoted from the writings of clinicians, investigators in the field of metabolism and others. The author is himself a roentgenologist. It is unfortunate that the equipment he was able to bring to his task did not include a requisite fundamental knowledge of disorders of the gastrointestinal tract.

Richtlinien praktischer Orthopädie. Von Dr. Albert Lorenz. Paper. Price, 15 marks. Pp. 464, with 123 illustrations. Vienna: Franz Deuticke, 1939.

The author, who apologizes for the similarity of his name to that of the father of German orthopedics, Adolf Lorenz, proposes his book for the use of specialists. He attempts to present only material which he considers of proved value; etiology and unusual symptomatology are handled more briefly than therapy and surgery; scientific experiments are given secondary consideration to practical experience and the general trend is conservative. The subject matter covers the complete category of practical orthopedic problems and their treatment. The fracture problem is confined to a discussion of fractures of the neck of the femur. This volume serves as a good compilation of current ideas in orthopedics. The author quotes freely from the American literature throughout the book, a large portion of which was written in New York. Although the material presents little originality, the discussions are adequate.

Arthritis in Women: A Clinical Survey with Notes and Statistics from Representatives of Committees on Rheumatism in Various Countries, and a Statement on the "Campaign Against Rheumatism, Retrospect and Outlook" (1935). Also a Suggestion for Setting up Rest Houses for Rheumatoid Arthritis. By R. Fortescue Fox, M.D., F.R.C.P., F.R.Met. Soc., President of the International League against Rheumatism. Founded on a Lecture Delivered at the Institute of Hygiene, London, April, 1936. Paper. Price, 2s. 6d. Pp. 35. London: H. K. Lewis & Co., Ltd., 1936.

The clinical course of arthritis in women is described. The material presented is accurate and well developed, but one would expect a great deal more from the title of the pamphlet. The pathology of arthritis is barely mentioned. The ideas of rest homes and spa treatments are not new but deserve emphasis at this time.

Trudy Stalingradskogo Gosudarstvennogo Meditsinskogo Instituta. Tom I. Pod redaktsey A. I. Bernshteyna, S. N. Kasatkina i A. Ya. Pytel'skiy. [Works of Stalingrad Medical Institute. Volume I.] Cloth. Pp. 137, with illustrations. Stalingrad: Oblastnoe knigoizdatel'stvo, 1939.

The volume consists of a monograph on the development of sesamoid bones in man and a medley of unrelated subjects. It presents little of interest to physicians and does not lend itself to review.

The Story of a Baby. By Marie Hall Ets. Cloth. Price, \$2.50. Pp. 63, with illustrations by the author. New York: Viking Press, 1939.

At the Century of Progress Exposition in Chicago in 1933 and 1934 one of the items of greatest interest was the exhibit of human embryos. In this beautiful book the author has redrawn the embryo and supplies a text printed in large type. She describes succinctly and beautifully the development of the baby. Many a parent will find a book of this type exceedingly useful in telling the story of childbirth to children of various ages.

English-German and German-English Medical Dictionary. Part I: English-German. Englisch-Deutsches medizinisches Wörterbuch. By Adalbert Springer. Fifth edition. Cloth. Price, 6 marks. Pp. 201. Vienna: Franz Deuticke, 1939.

This little medical dictionary is useful as far as it goes but omits a considerable number of words which might frequently need to be consulted, such as calibration, arrhythmia, fibrosis, ambulatory and sedation. The book is indicative of the relative ineffectiveness of any kind of dictionary which is not truly inclusive.

The Genuine Works of Hippocrates. Translated from the Greek by Francis Adams, LL.D. With an introduction by Emerson Crosby Kelly, M.D. Cloth. Price, \$3. Pp. 384. Baltimore: Williams & Wilkins Company, 1939.

This translation of Hippocrates has been reprinted many, many times, and there continues to be a demand for it. The present edition is put out in good paper, with a suitable binding, and has an index.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Silicosis: Death of Employee Attributed to Failure of Employer to Provide Safe Place of Work.—The plaintiff sued the defendant corporation to recover damages for the death of her husband. She alleged that he died from silicosis, contracted as a result of the failure of the defendant to provide him with a reasonably safe place in which to work. The trial court gave judgment for the plaintiff and the defendant appealed to the Supreme Court of Pennsylvania.

The plaintiff's husband was employed from 1924 to 1935 as an operator of a segment grinder, used for polishing ceramic or pottery products manufactured by the defendant. In October 1935 he was admitted to a state sanatorium for the treatment of tuberculosis and remained there until he died, Feb. 9, 1936. The plaintiff contended that the defendant failed to provide the grinder with an adequate hood and a sufficient device, such as a suction fan and pipe, for carrying away the dust. She charged that excessive quantities of dust containing free silica were released into the atmosphere about the machine and that as a result of inhaling this silica-laden air over a period of years her husband contracted silicosis, which brought about the tuberculous condition causing his death. The defendant was negligent, she further contended, because it failed to supply the employee with a dust mask of the character customarily worn by operators of such grinding machines. According to the plaintiff, the dust hazard arose because the defendant violated the provisions of a Pennsylvania act passed in 1915 requiring that "The owner or person in charge of an establishment where machinery is used shall provide . . . exhaust fans of sufficient power, or other sufficient devices . . . for the purpose of carrying off poisonous fumes and gases, and

dust from emery-wheels, grind-stones and other machinery creating dust." The plaintiff's evidence went to show that, although an exhaust fan was installed at the machine which her husband operated, it was not of sufficient power to carry off the dust produced; that the mechanism of the fan was not kept in working condition, and that the defendant failed to warn the employee of the dangers to which he was subjected in breathing the dust.

The defendant denied that the plaintiff's husband died of silicosis, claiming that the cause of his death was pulmonary tuberculosis contracted from causes having no relation to the conditions of his employment. It claimed that there was not a sufficient amount of free silica in the atmosphere about the grinder to cause silicosis. It further contended that it complied with the provisions of the Act of 1905 by attaching to the machine a dust-removal appliance of the best type available and in general use throughout the industry, that it provided the employee with a mask for his use but that he neglected to use it and, finally, that the employee was guilty of contributory negligence.

The disease to which the plaintiff attributed her husband's death, said the Supreme Court, was occupational and therefore was not compensable at the time under the workmen's compensation act of Pennsylvania. The real question before the court, therefore, was whether the defendant furnished the deceased a reasonably safe place to work as measured by the requirements of the Act of 1905. The provisions of that act are mandatory, the court pointed out, and proof that the employer has failed to comply with the duties imposed thereby and that an employee, without negligence on his part, has been injured as a result of such failure constitutes negligence, rendering the employer liable for the harm so caused. While the plaintiff admitted that there was a cover over the wheel and that a suction fan was installed by the defendant, it was denied that they were sufficient to eliminate the accumulation of dust in the atmosphere. It was not disputed by the defendant that the fan and cover were inadequate to carry away the dust about the grinding machine. The defendant urged, however, that it was not an insurer of the employee working at a dangerous piece of machinery and that it performed its full duty under the statute when the preventive devices which it adopted were of the kind generally approved and in use in like plants throughout the country. But, said the court, merely because the particular device employed was similar to that "generally approved and customarily used" in the industry of itself would not exonerate the defendant of the charge of negligence. While the custom or practice prevailing in a particular business in the use of methods, machinery and appliances is a most important factor in determining the question of negligence, ultimately it is for the jury to ascertain whether under all the circumstances the defendant was negligent. And certainly ordinary usage in disregard of a statutory duty cannot relieve the defendant of liability for a failure to respond to the legislative mandate. Whether or not the defendant in the present case was negligent presented a question for the jury to decide, and its finding for the plaintiff, the court said, compels the conclusion that the device used by the defendant was insufficient. An ineffective and feeble device is no more a fulfilment of the legislative demand than no device at all. The shadow of compliance will not be accepted for the substance of the statutory requirement.

There was some conflict in the evidence as to whether the death of the employee was caused by silicosis or by pulmonary tuberculosis. He inhaled a vast quantity of the dust particles in consequence of his constant exposure to them. The testimony was at variance on the question whether the atmosphere contained free silica in sufficient quantities to cause silicosis. The plaintiff produced evidence to the effect that silicosis could result from the constant inhalation of dust particles containing even a minute quantity of free silica. Experts testified that an autopsy disclosed the presence of "gritty" substance, scar tissue and "nodules" in the decedent's lungs, indicating that he suffered from silicosis. Other "nodules" were found pointing to a tuberculous as well as a combined tuberculous and silicotic condition. In the light of such testimony, the court said, it cannot be said that the jury's determination of this question is not supported by the record.

Ordinarily available in master-servant cases, the defense of assumption of risk is not permissible where the employee is injured through the failure of the employer to comply with a legislative requirement such as contained in the Act of Pennsylvania of 1905. Although the employee in the present case may have been aware of the presence of the dust in the factory, it is, the court said, extremely doubtful that he was conscious of the real risk involved, the danger of the contraction of silicosis. Such a degree of scientific knowledge is not to be attributed to an ordinary factory employee. The defendant contended that the employee was negligent in failing to use the dust mask with which he was provided. The plaintiff's witnesses testified, however, that no workable masks were supplied, since those furnished were unfit for use. Here again the question of contributory negligence was one for the jury to decide, and the Supreme Court could find no reason to disturb the finding of the jury with respect to this matter.

After a thorough review of the record, the Supreme Court of Pennsylvania affirmed the judgment of the trial court for the plaintiff.—*Price v. New Castle Refractories Co. (Pa.)*, 3 A. (2d) 418.

Optometry: Cooperative Arrangement Between Optical Company and Physicians as Practice of Optometry.

—In this suit, the State of Iowa on relation of the Commissioner of Health sought to enjoin the defendants from practicing optometry without a license. The trial court issued the injunction and the defendants appealed to the Supreme Court of Iowa.

The state undertook to sustain the injunction on the ground that the arrangement entered into between the defendants and the physicians constituted an employment agreement and that the employment of one legally authorized to practice optometry in the state of Iowa by an unlicensed person or corporation is prohibited by statute. The business of the defendants consisted of selling eyeglasses or spectacles by filling prescriptions prescribed by authorized persons and selling optical merchandise. They were opticians. Their practice was to rent an office consisting of one or more rooms adjacent to the rooms in which they carried on their business and to arrange with a licensed physician to occupy such rooms and practice optometry. The defendants paid the rent, light, heat and telephone bills and furnished all the equipment used by the physician in examining and testing eyes. The examination fees charged by the physician, which ranged from \$1 to \$2, belonged to him. None of the earnings of the physician belonged to or was paid to the defendants. The defendants, however, guaranteed the physician that his earnings would be \$40 a week. If the earnings were under that sum they would pay him the difference. While there was some testimony to the effect that the physician was not obligated to send patients to whom prescriptions had been given to the defendants, the court was convinced that the real arrangement was that the defendants would send all persons who came to their establishment without a prescription, and who desired glasses, to the physician and that the physician was to direct his patient to the defendants for the purpose of having his prescription filled.

In the opinion of the court, the state failed to establish its contention that the relationship of employer and employee existed between the defendants and the physicians. No witness testified that the defendants under the arrangement had the right to control or influence a physician in making the examination, and the test of the employer-employee relation, the court continued, is the right of the employer to exercise control of the details and method of performing the work. After reviewing the facts in this case, the court was convinced that the defendants did not have that right under the arrangement it had with physicians. The physicians, all of whom had practiced prior to the arrangement, were not performing the business of the defendants but were carrying on their own business of optometry under a reciprocal arrangement with the defendants for the mutual financial benefit of both parties. When a patient came to consult one of these physicians there was the personal relationship of patient and physician between them. The physicians, in making the refraction, represented the patient and not the defendants. The record showed that the business of the defendants was materially increased by the

arrangement. The court was satisfied after a careful reading of the record that the defendants did not coerce or influence the physicians relative to prescriptions. The profession of the physicians and the business of the defendants were separate and each operated independently of the other.

The defendants urged that the employment of one legally authorized to practice optometry in Iowa is not forbidden by statute, and even if the arrangement did constitute an employment contract it did not constitute the practice of optometry by the defendants in violation of the laws of the state. With this contention, however, the Supreme Court disagreed and in doing so reaffirmed the interpretation placed on Iowa laws and the principles announced in two previous cases, *State v. Kindy Optical Company*, 216 Iowa 1157, 248 N. W. 332, and *State v. Bailey Dental Company*, 211 Iowa 781, 234 N. W. 260.

The decree of the trial court enjoining the defendants from practicing optometry was therefore reversed and the case remanded.—*State ex rel. Bierring, Commissioner of Public Health, v. Ritholz et al. (Iowa)*, 283 N. W. 268.

Workmen's Compensation Acts: Compensability of Hernia.—The employee filed a claim for compensation under the workmen's compensation act of South Carolina, alleging that he had suffered a compensable hernia during the course of his employment with the defendant company. The industrial commission disallowed the claim, which action was affirmed by the common pleas circuit court of Spartanburg County. The employee then appealed to the Supreme Court of South Carolina.

The workmen's compensation act of South Carolina provides that in all claims for hernia alleged to have resulted from accidental injury sustained in the course of employment it must be definitely proved that there was an injury resulting in hernia; that the hernia appeared suddenly; that the hernia or rupture immediately followed the accident; that it did not exist prior to the accident for which compensation is claimed, and that it was accompanied by pain. The employee had been in the employ of the defendant company as a dispenser in one of its dye rooms continuously from February 1937 until July 14, 1937, the date he claimed to have suffered his injury. The employee's duties included bringing drums of hydrosol, weighing between 500 and 600 pounds, from a storeroom upstairs, inserting a spigot in the head of the drum and placing the drum on a low wooden rack. On the date of the accident, the employee, assisted by a fellow employee, was engaged in lifting a full drum of hydrosol on to the wooden rack when the spigot in the head of the drum became entangled with the framework of the rack and the drum slipped, jerking the employee and throwing a heavy strain on him for two or three minutes. With the assistance of a third employee, the drum was finally, after about ten minutes, placed in position. The employee continued working at lighter tasks for the remainder of that day. He stated that he was not conscious of any pain during the struggle with the metal drum, but after the lifting was over he said he "felt a tired and let down sensation." The next morning, July 15, when he got out of bed, he experienced a sharp pain, which continued that day and the following day, both of which days, however, he continued to work at light tasks. On July 17 he consulted a physician who diagnosed his trouble as inguinal hernia. On the succeeding morning he consulted the company physician, who made the same diagnosis and instructed him to quit work, which he did. The employee testified that he had no hernia or evidence of hernia previous to this accidental injury.

The employee had been operated on in the hernial region at the age of 7 years for an undescended testicle and was discharged as cured. The surgeon who performed this operation testified that there was no indication of hernia at that time. The company physician testified that the incision in the abdominal wall for the operation in question was at approximately the same place as for a hernia and that he found a scar in that region on the employee. He said with reference to that operation that it might or might not have caused a weakness of the tissues in that area and that a conclusion on that point could not be definitely stated. He testified, too, that the employee's hernia might have existed for several years but that there was

no way to determine from an examination when it had its inception or when the rupture occurred.

The industrial commission found that the hernia was congenital in origin and that it was caused by a preexisting weakness of the tissue. The Supreme Court, however, could find no evidence in the record to warrant that finding or a finding that the employee suffered from a hernia at any time prior to the accident. The commission found, too, that the employee felt no pain at the time of the accident, and the court thought that there was ample testimony in the record to support this finding. The employee repeatedly disclaimed that he felt pain at the time of the accident. He argued, however, that the language of the compensation act "that it was accompanied by pain," did not mean that pain must be coincident with the accidental injury, but that the appearance of the hernia must be accompanied by pain. As the court construed the act, however, the injury and the pain must be referable to a definite time, place and circumstance, and the pain must accompany the accidental injury. The court did not feel warranted in ascribing to the words "tired" and "exhausted" the common sense of the word "pain." Nontechnical definitions of "pain," said the court, while varying in form of expression, all connote some degree of present distress or suffering, contradistinguished from normal fatigue.

The court further thought that the words "suddenly" and "immediately" as used in the act in relation to hernia were elastic terms, admitting of much variety of definition. The court did not think that these words should be construed as the equivalent of the word instantaneous. Like other similar absolute expressions, they were used in the act with less strictness than the literal meaning requires. To give them their literal significance in all cases, regardless of the attendant situations and circumstances, would, the court said, often defeat meritorious claims on purely technical grounds.

Because, however, the employee felt no pain at the time of the accidental injury, the Supreme Court affirmed the judgment of the lower court disallowing the employee's claim for compensation.—*Rudd v. Fairforest Finishing Co. (S. C.)*, 200 S. E. 727.

Medical Services: Liability of County for Emergency Medical Services Rendered Indigents.—A physician, said the Supreme Court of Nebraska, not employed by a county may not recover from the county for services rendered to a poor person in an emergency when a county physician has been duly appointed to care for the poor, the latter physician being able, willing and ready to serve but not consulted. The ignorance of the attending physician of the fact that the county had regularly employed a county physician, and thus provided for the exclusive medical treatment of the poor, will avail him nothing.—*Miller v. Banner County (Neb.)*, 283 N. W. 206.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Alter Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

AMERICAN

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American Journal of Diseases of Children, Chicago

58: 691-930 (Oct.) 1939

- *Active Immunization Against Pertussis: Final Report on Cleveland Immunizations of 1934-1935. J. A. Doull, G. S. Shibley, Grace E. Haskin, Huldah Bancroft, J. E. McClelland and Helena Hoelscher, Cleveland.—p. 691.
- Experimental Asthma. B. Ratner, New York.—p. 699.
- Studies in Immunity: VI. Spontaneous Changes in Dick and Schick Reactions of Children. R. A. Lyon and A. G. Mitchell, Cincinnati.—p. 734.
- Factors Influencing Development of Sexual Attitudes and Sexual Awareness in Children. J. H. Conn, Baltimore.—p. 738.
- Response to Antiserums in Meningococcal Infections of Human Beings and Mice: Comparative Study. Hattie E. Alexander, New York.—p. 746.
- Effect of Irradiated Milks on Storage of Nitrogen and Acid-Base Minerals in Children. Frances Cope Hummel, Helen A. Hunscher and Icie G. Macy; with assistance of Mary Bates, Priscilla Bonner, J. Horton, Marion Shepherd, Helen Souders, Louise Emerson and A. Theresa Johnston, Detroit.—p. 753.
- Asthma in Children Treated with Autogenous (Bronchoscopic) Vaccine. Jean Crump, Philadelphia.—p. 768.
- *Basal Metabolism of Tuberculous Children: III. Tuberculosis of Bone. Anne Topper, New York.—p. 778.
- Familial Cleidocranial Dysostosis (Cleidal Dysostosis): Preosseous and Dental Dystrophy. W. E. Auspach and R. C. Huepel, Chicago.—p. 786.
- Sequence of Roentgen Evidence of Tuberculosis and Cutaneous Sensitivity to Tuberculin: Study of Infants. M. I. Levine, New York.—p. 799.
- *Iron Deficiency Anemia in Children. O. D. Abbott and C. F. Ahmann, Gainesville, Fla.—p. 811.
- Acute Suppurative Thyroiditis During Childhood. J. Greenfield and G. M. Curtis, Columbus, Ohio.—p. 837.

Active Immunization Against Pertussis.—Between May 27, 1934, and July 30, 1935, Doull and his colleagues gave pertussis vaccine to 483 Cleveland children from 6 to 15 months of age. The vaccine was prepared from strains of *Haemophilus pertussis* recently isolated and proved to be in phase I of Leslie and Gardner. The children were selected from the active registers of five child welfare stations of the Cleveland Division of Health. As a control group 496 children comparable in age and other pertinent characteristics were selected from the same sources. Four inoculated children who contracted pertussis early in the study evidently received the first dose of vaccine while in the initial stages of the disease. These children were omitted from further study. For the whole period of 172 weeks of observation the number of cases of pertussis reported was seventy-four in the inoculated group and ninety-four in the control group. Although incidence somewhat favors the inoculated, the difference is not impressive. Seventy-five of the inoculated and sixty-two of the control group were exposed to pertussis by its being introduced into the family by an older child. In two of the former cases it was ascertained that the disease was probably present in the home at the time of the first inoculation. If these children are regarded as not inoculated at the time of exposure, there are seventy-three instances in which inoculated children were subjected to household exposure. Fifty-six, or 77 per cent, of the children were attacked. In the control group the sixty-two exposures resulted in sixty-one attacks. From these figures the most that can be concluded is that under conditions of household exposure the vaccine may have protected 23 per cent of the inoculated children from attack. In an endeavor to classify the cases according to severity the records of the cases have been studied by different persons, but every tabulation has demonstrated a higher proportion of mild attacks in the inoculated than in the control group. On the average, higher leukocyte counts were found for patients of the control than for those of the inoculated group. This fact may

be interpreted as indicating more severe systemic reactions in the former. However, no significant differences were observed in the lymphocyte counts.

Basal Metabolism in Osseous Tuberculosis.—Topper determined the basal metabolic rates of fifty children with tuberculosis of bone both in the frankly active and in the apparently inactive stage. All these children were afebrile at the time of study and for long periods before and after study. Some of them have been followed for one and two years. The purpose of the investigation was to determine whether the basal metabolism could be used in the diagnosis of the activity of osseous tuberculosis. Thirty-six had normal basal metabolic rates, irrespective of whether the lesion was frankly active or apparently inactive. In this group the sedimentation rate of the erythrocytes did not parallel the metabolism. In fact, even in cases in which there was low grade fever (temperatures up to 100 or 101 F.) the metabolism was not increased. Similarly, in ten cases in which there were actively draining sinuses the metabolism was normal. The metabolism of fourteen children was found to be increased. Since the temperature of these children was for the most part normal and the osseous lesions similar to those of the thirty-six children with normal metabolism, further analysis was made to determine the cause for the increased metabolism. Of these fourteen children, all except two had active pulmonary tuberculosis of the primary type. This is consistent with previous observations of increased metabolism in pulmonary tuberculosis. Serial studies in some of these cases showed that when the tuberculous process in the lungs became inactive the metabolism returned to a normal level, irrespective of whether the osseous lesion was active or inactive. Therefore, for the diagnosis of activity in osseous tuberculosis one must depend on the roentgenogram, the leukocyte count, the sedimentation rate and clinical signs and symptoms of activity. The cause for increased metabolism in the childhood type of pulmonary tuberculosis as opposed to normal metabolism in other types of the infection is probably related to the extensive involvement of lymphatic tissue in this type of tuberculosis. The oxygen consumption of lymphatic tissue has been shown to be high, and it is especially so when the functional activity of such tissue is increased.

Iron Deficiency Anemia in Children.—According to Abbott and Ahmann, a study of hemoglobin values of 883 rural school children in Florida showed that 50 per cent of them were anemic and that 31 per cent had borderline anemia. The ratio between the number of children with the highest and the number with the lowest hemoglobin values was approximately 1 to 5. The administration of iron and ammonium citrates to 200 rural school children over forty-two days resulted in a rapid regeneration of hemoglobin. A diet high in iron-carrying foods produced an increase in hemoglobin in the forty-seven nursery school children so treated, but in cases of severe anemia, even after ninety days of the diet, the hemoglobin values remained subnormal.

American Journal of Hygiene, Baltimore

30: 33-62 Section A (Sept.) 1939. Partial Index

- 47-82 Section B
41-80 Section C
35-72 Section D
- Short Method for Constructing an Abridged Life Table. L. J. Reed and Margaret Merrell, Baltimore.—p. 33.

Sensitization to Tuberculin Produced in Children by Heat-Killed Tubercle Bacilli. E. W. Flabiff, Kingston, Jamaica, British West Indies.—p. 65.

Occurrence of Tuberculosis in Persons Who Failed to React to Tuberculin and in Persons with Positive Tuberculin Reaction. E. W. Flabiff, Kingston, Jamaica, British West Indies.—p. 69.

Micro-Organisms of Salmonella Choleraesuis Group Isolated in the United States. D. W. Bruner and P. R. Edwards, Lexington, Ky.—p. 75.

Observations on Parasitization of Erythrocytes by Plasmodium Vivax with Special Reference to Reticulocytes. G. Vryonis, Nashville, Tenn.—p. 41.

Experimental Infections in Anopheles Stephensi (Type) from Contrasting Larva Environments. P. F. Russell and B. N. Mohan, Guindy, Madras Presidency, India.—p. 73.

Experimental Studies on Course of Trichina Infection in Guinea Pigs: III. Immunity of Guinea Pigs to Reinfection with Trichinella Spiralis. H. Roth, Copenhagen, Denmark.—p. 35.

American Journal of Medical Jurisprudence, Boston

2: 301-336 (Aug.-Sept.) 1939

- Barbiturate Poisoning: Review. M. Pijoan, Boston.—p. 301.
Preparation by Attorneys for Medicolegal Trials. J. R. Garner, Atlanta, Ga.—p. 313.
Problem of Interference with Radio Communication by Electromedical Apparatus. F. H. Krusen, Rochester, Minn.—p. 315.
Legal Aspects of Radiodontics. A. P. S. Sweet, Rochester, N. Y.—p. 323.
Medical Jurisprudence: The Medical Witness. A. M. Showalter, Christiansburg, Va.—p. 326.
Medicolegal Problems. A. W. Stearns, Boston.—p. 331.

American J. Obstetrics and Gynecology, St. Louis

38: 371-556 (Sept.) 1939. Partial Index

- *Studies on Concentrations of Estrogenic and Gonadotropic Hormones in Serum of Pregnant Women. A. E. Rakoff, Philadelphia.—p. 371.
Growth of Fetus and Infant as Related to Mineral Intake During Pregnancy. W. W. Swanson and Vivian Job, Chicago.—p. 382.
Evaluation of Human Vaginal Smear in Relationship to Histology of Vaginal Mucosa. S. H. Geist and U. J. Salmon, New York.—p. 392.
Changes in Uterine and Placental Circulations During Different Stages of Pregnancy. P. J. Kearns, Montreal.—p. 400.
*Complications Associated with Excessive Development of Human Fetus. A. K. Koff and Edith L. Potter, Chicago.—p. 412.
Factor of Anesthesia in Pathogenesis of Asphyxia Neonatorum. M. Rosenfeld and F. F. Snyder, Baltimore.—p. 424.
Certain Laboratory Findings and Interpretations in Eclampsia. L. C. Chesley, Jersey City, N. J.—p. 430.
*Bacillus Welchii Infections in Pregnancy: Review of Literature and Report of Seventeen Cases. P. B. Russell Jr. and M. J. Roach, Memphis, Tenn.—p. 437.
Prevention of Tuberculosis Begins Before Birth: Tuberculin Testing During Pregnancy as Fertile Field for Case Finding and Prevention. C. L. Ianne and J. C. Muir, San Jose, Calif.—p. 448.
Treatment of Menopause with Estradiol Dipropionate. E. M. Dorr and R. R. Greene, Chicago.—p. 458.
Surgical Treatment of Bilateral Polycystic Ovaries—Amenorrhea and Sterility. I. F. Stein and M. R. Cohen, Chicago.—p. 465.
Vitamin A Deficiencies in Pregnancy: Case Reports on Two Unusually Severe Examples. W. A. Ricketts, Dayton, Ohio.—p. 484.
Changes of Urinary Tract Associated with Prolapse of Uterus. A. J. Wallingford, Albany, N. Y.—p. 489.
Study of Cause of Hydranmios. J. R. Goodall, G. Morgan and R. H. Power, Montreal.—p. 494.
Concentration of Serum Sulfate During Pregnancy and Preeclamptic Toxemia. A. B. Hunt and E. G. Wakefield, Rochester, Minn.—p. 498.
Hidradenoma of Vulva. D. Rothman and S. H. Gray, St. Louis.—p. 509.
Carcinoma of Cervix in a Girl of 19 Years. H. Charache, Brooklyn.—p. 518.
Simple Technic for Craniotomy on High Aftercoming Head. G. W. Gustafson, Indianapolis.—p. 522.
Dietary Requirements in Pregnancy. W. J. Dieckmann and W. W. Swanson, Chicago.—p. 523.

Estrogenic and Gonadotropic Hormones in Pregnant Women.—Rakoff studied a simplified improved technic for the titration of estrogenic and gonadotropic hormones in the serum of pregnant women, which proved to be useful in following the concentrations of these hormones in normal gestation and in a number of the complications of pregnancy, especially the toxemias and abortion. The method requires from 20 to 50 cc. of blood. Estrogenic hormone was assayed by a modification of the Fluhmann technic. Gonadotropic hormone was titrated by a modification of the Aschheim-Zondek test. Whole serums were used as the test solutions and mice as the test animals. It was observed that the estrogen and gonadotropic hormone values on unextracted serums are much higher than those obtained on extracted specimens. Serum titrations repeated at frequent intervals gave much more consistent results than those obtained from urinary assays. A total of 162 serum titrations were conducted on forty normal pregnant women in various periods of gestation, and graphs were prepared showing the normal range and average values from the fourth week of gestation to term. Serum titrations conducted on a group of twenty-two patients with toxemias of late pregnancy usually showed abnormally high gonadotropic hormone and low estrogen values. The severity of the toxemia did not appear to be directly related to the degree of abnormality in gonadotropic hormone and estrogen values, except that those patients with marked edema showed unusually high gonadotropic hormone readings in the serum. Improvement in the clinical condition was generally associated with a return of the estrogen and gonadotropic hormone values to the normal range. Studies on three patients in whom titrations were available before the onset of toxemia showed in two instances high gonadotropic hormone values preceding the onset of toxemia by several weeks. These were later followed by low estrogen values. There was gener-

ally a reciprocal relationship between the rise and fall of estrogen and gonadotropic hormone. Three patients with nephritic toxemia showed high gonadotropic hormone and usually low estrogen values during the period of clinical toxemia. However, one patient with a glomerulonephritis, who had a history of nephritic toxemia and eclampsia in the previous pregnancy, showed normal values for estrogen and gonadotropic hormones, except during two periods associated with signs and symptoms of toxemia. When intra-uterine fetal death was suspected, repeated examinations of the serum for gonadotropic hormone furnished a better means of determining the fate of the fetus than did the Friedman test. With the author's technic the gonadotropic hormone content of the serum fell to 50 m units per hundred cubic centimeters or less the Friedman usually became negative. One patient with pernicious nausea and vomiting had a low gonadotropic hormone content of serum, while the serum estrogen was normal.

Complications from Excessive Development of Fetus.—Koff and Potter say that, provided the pelvis is not contracted it is rare for infants weighing less than 4,500 Gm. to give to dystocia due to size. It has been found, however, that delivery of an infant weighing more than 4,500 Gm. is frequently attended with serious difficulties. Investigating the incidence of the birth of excessively developed fetuses, the authors found that among 20,219 births at the Chicago Lying-in Hospital 195, or 0.94 per cent, of the infants weighed more than 4,500 Gm. Since the size of the fetus is largely dependent the length of gestation, the authors investigated the duration of pregnancy (calculated from the first day of the last menstrual period) in the cases on which this study is based. The average length of gestation of the women with excessively developed fetuses was 288 days. This figure when compared with the figures for normal pregnancy demonstrates the direct relationship between prolongation of pregnancy and excessive development of the fetus. However, size of the parents, multiparity, advancing age, or diabetes in the mother may be contributory factors in producing excessive fetal development. Labor presents a greater hazard for both mother and offspring when overdevelopment of the fetus has occurred. The necessity for operative intervention is increased and the incidence of toxemia of postpartum hemorrhage, of maternal morbidity and of fetal mortality is definitely higher than when the fetus is small. Accurate estimation of fetal size prior to delivery with consequent modification of the technic employed will decrease maternal complications and fetal mortality.

Bacillus Welchii Infections in Pregnancy.—Russell and Roach report their experiences in seventeen cases of Bacillus welchii infections occurring in their clinic. They differentiate the following types: (1) local gas gangrene, (2) emphysema of the uterine wall and (3) gas sepsis. They subdivide the latter type into (a) general sepsis and (b) metastatic gas gangrene. After discussing these various types they give their attention to the differential diagnosis, pointing out that the physical examination does not give much information in Bacillus welchii infections because the predominating symptom is tenderness of the lower part of the abdomen, uterus, liver, kidneys and spleen and all these may be tender in a simple case of abortion. The heart cycle and pulse rate are again of no value. Peritonitis is not found in the mild cases, but it is found in cases in which there is a general sepsis with or without emphysema and phlegmon. Cyanosis is one of the common symptoms which accompany Bacillus welchii infection but it is important to differentiate between that resulting from sulfanilamide therapy or that which is seen in the later stages of eclampsia. Jaundice is another symptom which occurs in the more severe cases but not in those which are classified as local infection. The odor of the patient suffering from a Bacillus welchii infection is not much different from that associated with typhoid. The pulse also is similar; however, the patient suffering from the Bacillus welchii infection has not the facies of anxiety found in the patient with typhoid. The temperature is usually lower in the former disease than in the latter, and the patient suffering from a Bacillus welchii infection has a cold and clammy skin in contrast to the hot and moist skin of the typhoid patient. Incontinence of urine and feces is a rather common occurrence in severe infections of Bacillus welchii. The exact diagnosis is

Bacillus welchii infection is not always easy. Laboratory observations and x-ray examination are the final criteria for the diagnosis. The treatment of this infection is varied and there is no preparation which will cure all cases. Massive doses of a polyvalent serum for streptococci and *Bacillus welchii* should be administered on admission. Strict isolation of the patient is of great importance. Because of the spore-bearing properties of *Bacillus welchii*, the authors insist that all instruments and materials be fractionally sterilized. Repeated intra-uterine cultures, douches and transfusions should be made as soon as the organism has been identified by smears and cultures. It is important also to combat acidosis, anemia and low urinary output. The senior author decided that hydrogen peroxide and a gentle débridement of the necrotic materials; the liberated oxygen would destroy the anaerobes, and the dibrom-oxymery-fluorescein would destroy those organisms causing the mixed infection found in the more severe cases. He suggests that these intra-uterine douches be repeated at least every other day because of the spore-bearing characteristics of *Bacillus welchii*. Vaginal instillations with the same mixture seemed to be efficacious in the treatment of the vaginal necrosis and were given twice daily. The authors emphasize that gas producing bacteria should be of extreme importance to doctors in contact with rural patients because these bacteria are often found in the intestinal tract of herbivorous animals.

Annals of Medical History, New York

- 1: 405-486 (Sept.) 1939
Henry Fraser Campbell. Cecilia C. Mettler and F. A. Mettler, Augusta, Georgia.—p. 405.
The Centenary of the Cell Doctrine. E. B. Krumhaar, Philadelphia.—p. 427.
Medicine in the Life of François Rabelais. D. Slaughter, Dallas, Texas.—p. 438.
Early History of Gas Gangrene. C. E. Kellett, Newcastle-on-Tyne, England.—p. 452.
Century of American Medicine in Syria. A. A. Khairallah, Beirut, Syria.—p. 460.
The Aphorisms of Corvisart. A. L. McDonald, Duluth, Minn.—p. 471.

Archives of Physical Therapy, Chicago

- 20: 529-592 (Sept.) 1939
Short Wave Diathermy in Chronic Prostatitis: Preliminary Report. D. K. Hibbs, Chicago.—p. 533.
Electrosurgical Management of Bladder Neoplasms. H. Culver, Chicago.—p. 538.
Low Temperature Technic for Artificial Fever Induction. M. M. Cook, Minneapolis.—p. 544.
Fever Therapy in Acute Rheumatic Disease. E. E. Simmons and F. L. Dunn, Omaha.—p. 547.
Present Status of Short Wave Diathermy. R. Kovács, New York.—p. 559.
Observations on Radiotherapy from the General Surgeon. D. D. Bowers, Indianapolis.—p. 567.

Fever Therapy in Acute Rheumatic Disease.—The effects of physically induced fever in thirty-one cases of acute rheumatic fever in which the Kettering hypertherm cabinet was used are reported by Simmons and Dunn. The patients have been under observation for from one month to three and one half years. In the group there were eleven cases of mitral stenosis, fourteen of systolic murmurs, one of acute pericarditis, one of pericarditis and effusion and one of acute carditis and a pulse deficit. Complete and prompt relief of joint pain and swelling was obtained in almost all cases. The periods of artificial fever (from 103 to 106 F.) varied from five to sixty-five hours. In no case was it possible to determine that the cardiac lesions were aggravated by fever therapy. The period of subclinical activity was shortened and in the cases of minimal cardiac involvement the murmurs disappeared. These results cannot be fully ascribed to the effect of fever therapy alone. Symptomatic relief from joint pain has been afforded regardless of the presence of significant foci of infection, but data on the prolonged effect of fever therapy on such foci are not had since they were removed subsequently. Fever therapy is not a substitute for the removal of significant foci of infection. Fifteen of twenty cases showed a sharp drop in the sedimentation rate during the course of or immediately following fever therapy. More time must elapse and larger groups must be observed before the position of fever therapy can be established, but the authors feel that it is of definite aid in the treatment of acute rheumatic fever.

Arkansas Medical Society Journal, Fort Smith

- 36: 103-122 (Oct.) 1939
Urogenital Tuberculosis. H. F. H. Jones and T. D. Brown, Little Rock.—p. 103.
Fractures and Dislocations of Neck. J. F. Shuffield, Little Rock.—p. 106.
Interpretation of Kidney Function Tests. C. E. De Angelis, Little Rock.—p. 109.

Canadian Medical Association Journal, Montreal

- 41: 223-322 (Sept.) 1939. Partial Index
Attempt to Inhibit Development of Tar Carcinoma in Mice (Fifth Report). J. R. Davidson, Winnipeg, Man.—p. 223.
Treatment of Addison's Disease by Synthetic Adrenal Cortical Hormone (Desoxycorticosterone Acetate). R. A. Cleghorn, J. L. A. Fowler and J. S. Wenzel, Toronto.—p. 226.
Subcutaneous Emphysema Complicating Pertussis. E. M. Worden and A. F. Chaisson, Montreal.—p. 237.
Clinical Applications of Electro-Encephalography. H. H. Hyland, J. E. Goodwin and G. E. Hall, Toronto.—p. 239.
Diabetic Infection and Gangrene. G. Murray, Toronto.—p. 246.
Hyperchromic Macrocytic Anemia in Association with Hodgkin's Disease. S. R. Townsend and A. L. Braunstein, Baltimore.—p. 254.
Results of Self Selection of Diets by Young Children. Clara M. Davis, Winnetka, Ill.—p. 257.
Reactions from Sodium Morphate in Sclerosing of Varicose Veins. G. A. Holland, Montreal.—p. 262.
Active Immunization Against Whooping Cough. N. Silverthorne, Toronto.—p. 263.
Report of 116 Controlled Cases of Epilepsy. D. O. Lynch, Woodstock, Ont.—p. 266.
Pulmonary Embolism. B. Plewes, Toronto.—p. 271.
Action of Sulfonamide in Infective Colds. A. L. Yates, Halifax, N. S.—p. 275.
Untreated Taboparesis with Negative Spinal Fluid. C. H. Gundry, Brockville, Ont.—p. 287.

Desoxycorticosterone Acetate for Addison's Disease.

To date Cleghorn and his colleagues have used desoxycorticosterone acetate in nine cases of Addison's disease and in all there has been undoubted clinical improvement. The principal subjective benefit appears to be a greatly increased sense of well being and vigor. Objectively the blood pressure, serum sodium and body weight increase. Hemoconcentration disappears, as indicated by the fall in hemoglobin and the decrease in the percentage of erythrocytes. Added salt is tolerated better and the appetite improves. Desoxycorticosterone acetate has a definite advantage in that it can be given in small injections and is less painful than adrenal cortex extract. Cases of local reaction with fever following the use of desoxycorticosterone acetate in oil have been reported, but the authors believe that this is due to accidental subcutaneous injection. It must be injected intramuscularly. The danger of using the test recently described by Cutler, Power and Wilder (the withholding of salt) as being diagnostic for Addison's disease is emphasized.

Electro-Encephalography.—According to Hyland and his associates, the principal clinical value of the electro-encephalogram in its present stage of development, apart from the study of epilepsy, is in the localization of tumors which involve the cerebral cortex. In other organic diseases of the brain and in mental disorders the usefulness of the electro-encephalogram is still limited. Gross abnormalities in the recorded waves are usually absent in the majority of these conditions. Further repeated investigation is necessary, particularly in cases in which the otherwise normal "alpha" frequency is found to be below 7½ per second or less, may be seen alone or in conjunction with other slow waves. While little is known regarding their significance, there is some evidence to indicate that they represent pathologic changes associated with an impairment of cortical function. Here again future investigations doubtless will result in improved methods of recording and in the interpretation of observations, so that the scope of the electro-encephalogram in diagnosis may be greatly increased.

Self Selection of Diets by Children.—Over a period of six years Davis observed the results on fifteen infants from the time of weaning (from 6 to 11 months of age) on a self selected diet. Each child was observed for not less than six months and all but two from one to four and a half years. Food was not offered to the infant either directly or by suggestion. The nurses' orders were to sit quietly by, spoon in hand, and make no motion, and only when the infant reached for or pointed to a dish might she take up a spoonful and, if he opened his mouth for it, put it in. He might eat with

his fingers or in any way he could without comment on or correction of his manners. The tray was taken away when he had definitely stopped eating, which was usually after from twenty to twenty-five minutes. The foods offered were weighed before and after the infant's selection. There were no failures of infants to manage their own diets; all had hearty appetites; all thrived. Constipation was unknown among them and laxatives were never used or needed. Except in the presence of parenteral infection, there was no vomiting or diarrhea. Colds were usually of the mild three day type without complications of any kind. There were a few cases of tonsillitis but no serious illness among the children in the six years. The only epidemic disease to visit the nursery was acute glandular fever of Pfeiffer, with which all the children in the nursery came down like ninepins on the same day. During this epidemic trays were served as usual. This led to the observation that, just as loss of appetite often precedes by twenty-four to forty-eight hours every other discoverable sign and symptom of acute infection, so return of appetite precedes by twelve to twenty-four hours all other signs of convalescence, occurring when fever is still high and enabling the observer to predict its fall correctly. This eating of a hearty meal when fever is still high is often not in evidence when children are put on restricted diets during such illnesses. The correctness of the observation has been confirmed in the Children's Memorial Hospital, where a modification of the self-selective method of feeding prevails. During convalescence unusually large amounts of raw beef, carrots and beets were eaten. The demand for increased amounts of raw beef and carrots can be easily accounted for but for the beets; it may be possible that they furnish an antianemic substance (iron?). Beets were eaten by all in much larger quantities in the first six months or year after weaning than ever again save after colds and acute glandular fever. Whether appetite was or was not a competent guide to an adequate diet was checked by diets with nutritional laws and standards and it was found that the infants either approximated or exceeded the average daily calory requirement. There was a moderate preponderance of the potentially alkaline in every six months period in fourteen infants. The other one was observed for only six months. The food list was confined to natural, unprocessed and unpurified foods, without made dishes of any sort, and it reproduced to a large extent the conditions under which primitive peoples in many parts of the world have been shown to have had scientifically sound diets and excellent nutrition. By providing conditions under which appetite could function freely and beneficently the experiment resolved the modern conflict between appetite and nutritional requirements. It eliminated anorexia and the eating problems that are the plague of feeding by the dosage method.

Delaware State Medical Journal, Wilmington

11: 191-210 (Sept.) 1939

- Modern Trends in Psychiatric Therapy. K. E. Appel and J. A. Flaherty, Philadelphia.—p. 191.
Psychoneuroses in Relation to General Medicine. A. Gordon, Philadelphia.—p. 197.

Florida Medical Association Journal, Jacksonville

26: 109-160 (Sept.) 1939

- Some Observations on Treatment of Pellagra. J. F. Wilson, Jacksonville.—p. 123.
Thyroid and Adrenal Glands as Factors in Control of Fever: Heat Regulation and Climate. N. L. Spengler, Tampa.—p. 126.
Myocardial Infarction: Electrocardiographic Changes and Necropsy Findings. J. W. Annis, Lakeland.—p. 131.
Surgical Conditions Caused by Intestinal Parasites. T. H. Bates, Lake City.—p. 137.
Abdominal Foreign Body: Case Report. J. K. McShane, Miami.—p. 139.
Erythematous Lupus in Negro Youths: Case Report. J. L. Kirby-Smith, Jacksonville.—p. 141.

Georgia Medical Association Journal, Atlanta

28: 347-390 (Sept.) 1939

- Some Phases of Medical Economics. H. H. Shoulders, Nashville, Tenn.—p. 347.
The Social and Economic Value of Health. R. F. Maddox, Atlanta.—p. 354.
Advances in Recognition and Treatment of Nutritional Disturbances. V. P. Sydenstricker, Augusta.—p. 359.
Effect of Nervous Influences on Digestion. E. F. Wahl, Thomasville.—p. 354.
Public Health Progress. S. C. Rutland, LaGrange.—p. 367.

Journal of Bacteriology, Baltimore

38: 249-354 (Sept.) 1939

- Studies on Life and Death of Bacteria: I. Senescent Phase in Aging Cultures and Probable Mechanisms Involved. E. A. Steinhaus and J. M. Birkeland, Columbus, Ohio.—p. 249.
*Cultural Study of Filamentous Bacteria Obtained from Human Mouth. B. G. Bibby and G. P. Berry, Rochester, N. Y.—p. 263.
Optimal Temperature for Differentiation of *Escherichia Coli* from Other Coliform Bacteria. A. A. Hajna and C. A. Perry, Baltimore.—p. 275.
Some Growth Factors for Hemolytic Streptococci. D. W. Woolley and B. L. Hutchings, Madison, Wis.—p. 285.
Growth Factors for Bacteria: VIII. Pantothenic and Nicotinic Acids as Essential Growth Factors for Lactic and Propionic Acid Bacteria. E. E. Snell, F. M. Strong and W. H. Peterson, Madison, Wis.—p. 293.
Influence of Nicotinic Acid on Glucose Fermentation by Members of Colon-Typhoid Group of Bacteria. I. J. Kligler and N. Grosowitz, Jerusalem, Palestine.—p. 309.
Collodion Sac for Use in Animal Experimentation. A. H. Harris, Albany, N. Y.—p. 321.
Studies on Mode of Action of Sulfanilamide in Vitro. Julia T. Weld and Lucy C. Mitchell, New York.—p. 335.

Bacteria Obtained from Mouth.—By the use of anaerobic methods and of a wide variety of culture mediums, Bibby and Berry isolated from the mouth many strains of filamentous bacteria. On the basis of the morphology and the characteristics of growth of the eighty-three strains which were successfully carried in subculture, a tentative working division into seven groups is proposed. Six of these have distinct characteristics. Only two, however, can be identified with organisms which have been isolated by previous investigators, although organisms showing some resemblance to a third group have been described. Four of the groups of filaments have the characteristics of the genus *Leptotrichia*, one of the genus *Fusiformis* and one of both genera. Of all the groups, only one embraced strains all of which were alike in biologic properties. For these organisms the authors suggest the name *Leptotrichia buccalis* because they represent the most commonly isolated of the culturable oral filaments.

Journal of Immunology, Baltimore

37: 179-304 (Sept.) 1939. Partial Index

- *Agglutinative Reaction in Relation to Pertussis and to Prophylactic Vaccination Against Pertussis, with Description of New Technique. J. J. Miller Jr. and Rosalie J. Silverberg, San Francisco.—p. 207.
New Schick Toxin. E. M. Taylor and P. J. Moloney, Toronto.—p. 223.
Complement Fixation and Precipitative Tests in Poliomyelitis. J. A. Harrison, Philadelphia.—p. 233.
Studies of Sparing Effect of Lymphocytic Choriomeningitis on Experimental Poliomyelitis: I. Effect on Infectivity of Monkey Tissues. G. Dalldorf, Vallalla, N. Y.—p. 245.
Group Specific Differentiation of Organs of Man: Type Specific M Factors and N Factors in Organs. P. N. Kosjakov and G. P. Tribulev, Moscow, Soviet Union.—p. 283.
Effect of Temperature and Drying on M Factors and N Factors of Human Blood. P. N. Kosjakov and G. P. Tribulev, Moscow, Soviet Union.—p. 297.

Agglutinative Reaction and Pertussis.—Miller and Silverberg describe a new technic of tube agglutination for *Haemophilus pertussis*. Mechanical rocking of the tubes for two hours at room temperature is sufficient. A twenty-four hour growth of *Haemophilus pertussis* is used. The small amount of serum required (0.1 cc.) may be collected in a Lyon tube by ear or toe puncture. The serums from ten of 101 children with negative histories for pertussis produced agglutination, but in children less than 5 years of age the agglutinative titers in the positive serums were not higher than 1:20. The serums from 161 of 164 children who had been injected with phase I *Haemophilus pertussis* vaccine produced agglutination. The titers of the positive serums were in general high, usually 1:160 or higher. Second and occasionally third specimens of serum were obtained at wide intervals up to thirty-eight months after vaccination and these showed a tendency to maintain their titer. The serums from fifteen of seventeen children with pertussis produced agglutination at some time during the disease. The titer of agglutination attained was extremely variable and seldom more than 1:160. The serums from thirty-six of sixty-seven children who had recently recovered from pertussis produced agglutination. On retesting after intervals of several months consistent decreases in titer were observed. Many serums had become negative though occasional serums produced agglutination up to twenty-five months after the onset of the disease.

Medical Annals of District of Columbia, Washington

S: 255-284 (Sept.) 1939

- *Phenolphthalein Eruptions: Report of Three Cases. I. L. Sandler, Washington.—p. 255.
- General Considerations and Differential Diagnosis of Jaundice Depicted by Cryptograms. W. M. Yater, Washington.—p. 258.
- Surgical Considerations of Jaundice. A. Horwitz, Washington.—p. 261.
- Physiology of Digestion. E. C. Albritton, Washington.—p. 265.
- Comparison of Roentgen and Gastroscopic Findings in Diseases of Stomach. J. F. Elward, Washington.—p. 269.

Phenolphthalein Eruptions.—Sandler discusses phenolphthalein eruptions and reports three such cases, one of which leads him to believe that phenolphthalein is present in the skin in the early stage of the eruption. The author finds no reference to a similar observation in the literature. It has been stated that except for the ingestion test no other forms of testing have been evolved which are of value in the diagnosis or prognosis of existing hypersensitiveness to the drug. The author shows that the oral administration of a small dose (0.0065 Gm.) of the suspected drug is the best method of determining the causative agent. In his cases, in about one hour after its administration, edema of the lips with deep seated vesicles occurred and the hue in the fixed phenolphthalein lesions was greatly accentuated.

Michigan State Medical Society Journal, Lansing

38: 837-924 (Oct.) 1939

- What Price Depression? R. Sleyter, Wauwatosa, Wis.—p. 853.
- Ideals. H. A. Luce, Detroit.—p. 859.
- Poliomyelitis. H. B. Rothbart, Detroit.—p. 861.
- Survey of Syphilis in Oakland County for 1938. The Committee on Syphilis of the Oakland County Medical Society.—p. 867.
- Our Changing Medical Service. A. H. Miller, Gladstone.—p. 869.
- Carbon Monoxide Poisoning. W. D. McNally, Chicago.—p. 871.
- Massive Gangrene of Colon Secondary to Acute Appendicitis. V. W. Jensen, Shelby.—p. 877.
- Two "Liver Deaths" Following Ovariectomy. H. W. Hewitt, Detroit.—p. 879.
- Blood Groups and Their Medicolegal Applications. A. W. Frisch, Detroit.—p. 881.
- Luminal and Postoperative Temperature. B. F. Garipey, Royal Oak.—p. 887.
- Report of an Isolated Case of Paratyphoid B. F. L. Graubner, Marshall.—p. 888.
- Role of Allergy in Some Dermatoses of Questionable Etiology. H. L. Keim, Detroit.—p. 888.
- Fundamentals of Treatment in Gynecology. H. M. Kirschbaum, Detroit.—p. 891.

New England Journal of Medicine, Boston

221: 403-444 (Sept. 14) 1939

- Prothrombin and Vitamin K Therapy. J. D. Stewart and G. Margaret Rourke, Boston.—p. 403.
- *Use of Cobra Venom in Relief of Intractable Pain. R. N. Rutherford, Brookline, Mass.—p. 408.
- Practical Psychotherapy with Adolescents: Brief Survey of the Field for the General Practitioner. D. J. Sullivan and N. B. Flanagan, Boston.—p. 414.
- Benno Reinhardt, 1819-1852: Biographic Study and Contribution to Early History of Virchow's Archiv. G. J. Newerla, Albany, N. Y.—p. 419.
- Report on Medical Progress: Physical Therapy. F. P. Lowry, Newton, Mass.—p. 424.

Cobra Venom for Intractable Pain.—Rutherford used cobra venom for the relief of intractable pain in seventeen cases, generally because of terminal cancer. It is important that the drug be given intramuscularly, for if it is given subcutaneously it will cause local redness and tenderness for several days. At the beginning of the series, treatment was started with an injection of 0.5 cc. (2½ mouse units), followed by daily injections of 1 cc. (5 mouse units). Later the author endeavored to adjust the initial dose to the requirements of the patient, beginning in some cases with 2 or 3 cc. (10 or 15 mouse units) and continuing the dosage at that level for from four to six days or until complete relief was obtained, and then considerably lowering the dose to a maintenance level. Eight of the seventeen patients (46 per cent) considered themselves completely relieved. Four of the group (24 per cent) estimated their relief at from 75 to 95 per cent. Three (18 per cent) estimated their relief at from 50 to 75 per cent. In only two did the amount of relief fall below 50 per cent. In other words, nearly 50 per cent of the patients were completely relieved of pain and in 88 per cent the relief was 50 per cent or more. If there is a response it usually begins on the third or fourth day of injection, despite the amount used, and is complete by the sixth or seventh day. The benefits are not

likely to increase after that time, but the relief of pain is likely to continue at that level, even though the amount of cobra venom is reduced to a maintenance level, determined by the patient. The majority of patients were able to maintain their relief on one ampule every other day or one a day, although several required two or three a day. There were no side reactions and there was no evidence that increasing amounts of the drug were necessary. The drug seemed to act on pain no matter what its etiology. When relief from pain is obtained the mental outlook and general health of the patients are benefited by release from the sharp drag of constant pain. Some patients are able to return to their work and to become wage earners again. In those who are only partially helped, the drug makes an excellent basal analgesic which can be augmented by analgesics that are not habit forming. This avoids the danger of morphine addiction and increasing opiate tolerance. For those patients who are not helped, intrathecal alcohol injection or chordotomy should be considered. Since cobra venom can be self administered, it makes an ideal outpatient treatment or treatment which can easily be followed by the general practitioner in the nonhospitalized case. There is no evidence of danger of addiction, increasing tolerance or toxicity of the drug.

New Jersey Medical Society Journal, Trenton

36: 525-568 (Sept.) 1939

- Value of Roentgen Therapy in Acute Subacromial Bursitis. W. G. Herrman, Asbury Park.—p. 529.
- The Eye in Diabetes. S. Schulsinger, Newark.—p. 533.
- Histology of Radiation Effects in Inflammatory Conditions. R. Pomeranz, Newark.—p. 536.
- Cystocele. J. W. Davies, New York.—p. 538.
- Chronic Paranasal Sinusitis, a Medical Problem. G. H. Lathrop, Newark.—p. 542.
- The Medical Approach to Gallbladder Problem. S. B. Kaplan, Newark.—p. 550.

New Orleans Medical and Surgical Journal

92: 171-234 (Oct.) 1939

- Extra-Uterine Pregnancy. C. P. Gray and C. P. Gray Jr., Monroe, La.—p. 171.
- Management of Urinary Infections in Pregnancy. U. S. Hargrove, Baton Rouge, La.—p. 176.
- The Twisted Nose. W. R. Metz, New Orleans.—p. 180.
- Treatment of Empyema. R. M. Penick Jr., New Orleans.—p. 185.
- Some Problems in Surgical Treatment of Thyroid Disease. J. E. Heard, Shreveport, La.—p. 190.
- Cataract. G. M. Haik, New Orleans.—p. 195.
- Mode of Action of X-Rays in Otitis Media. L. L. Titcher, Monroe, La.—p. 203.
- Acute Spinal Epidural Abscess: Report of Four Cases. J. O. Weilbaecher Jr., New Orleans.—p. 208.

Oklahoma State Medical Assn. Journal, McAlester

32: 317-358 (Sept.) 1939

- Experiences with Internal Fixation in Fractures of Hip. C. R. Rountree, Oklahoma City.—p. 317.
- Removal of Nonmagnetic Foreign Bodies from Vitreous: Report of Case. J. J. Caviness, Oklahoma City.—p. 326.
- Practical Management in Peripheral Vascular Disease. B. E. Mulvey, Oklahoma City.—p. 330.
- Interstitial Radium Treatment of Cancer of Lower Lip. L. K. Chont, Oklahoma City.—p. 334.
- *Use of Autohemotherapy Reinforced with Artificial Fever in Treatment of Rheumatic Disease. W. K. Ishmael, Oklahoma City.—p. 337.

Autohemotherapy and Hyperpyrexia for Rheumatic Disease.—As an increase in the body temperature is a natural defense mechanism, it occurred to Ishmael that the artificial fever may reinforce the reaction of the injected blood (autohemotherapy). Based on this idea he applied these measures to 168 rheumatic patients. From 10 to 20 cc. of blood was withdrawn and immediately re injected into the muscles of the hip. This is done before clotting takes place and nothing need be added to the blood. The artificial fever is instituted immediately following the autotransfusion and a temperature of 101.5 F. for one hour, the inductotherm being used for adults and intravenous typhoid vaccine for children. With inductothermy, approximately one hour was required to reach 101.5 F.; this temperature was maintained for one hour and about two hours was necessary for the temperature to return to normal. Patients were allowed to eat a normal meal before the fever was started and occasionally from 10 to 25 grains (0.65 to 1.6 Gm.) of sodium chloride was supplied along with ample fluids. No untoward reactions have been experienced and

patients resume their normal activities when the temperature returns to normal. Optimal results were obtained when the procedure was repeated every four days. In the average case, from six to ten treatments were given. The most striking results were obtained in acutely inflamed joints. Forty-four such cases were treated by this combined rapid desensitization method and all responded completely in an average of seventy-six hours. In none have there been any recurrences. To date the types of joints treated in the acute phase included seven of acute gonococcic arthritis, two of acute gouty arthritis, fifteen of acute infectious (atrophic) arthritis and twenty diagnosed as acute fibrositis. All these cases were in the acute phase and not chronic exacerbations. In the acute gonorrheal cases the urethritis had to be treated by other measures after the joint and sedimentation time had returned to normal. Twenty patients with rheumatic fever received artificial fever of 104 F. for an average total of eight hours; fifteen had complete remission and five "improved." Those receiving only autohemotherapy or fever of 101.5 F. or less failed to improve. Of ten patients with chronic infectious arthritis given combined therapy, one had a remission in four weeks, four were improved, five had no effect and none suffered an exacerbation. Three others given fever only (101 F. for one hour) had no remissions, only one improved and there were no exacerbations. Three similar patients given only autohemotherapy had no remissions, two "improved," the condition of one remained unchanged and none flared up. Thirteen patients diagnosed as having chronic fibrositis received the combined therapy, fifteen only the fever and two the autohemotherapy only. Twelve of the thirteen had a remission and one was improved. Fourteen of the fifteen had a remission and one was improved. Of the two receiving only the autohemotherapy the group diagnosed as having hypertrophic arthritis (menopausal arthralgias) the main effects of the autohemotherapy seem to be in the delayed absorption afforded by the presence of the blood. In the thirty cases exhibiting rheumatic exacerbations, from three to five days prior to and during each complete remissions were seen in twenty-six of the thirty cases treated. Three were "improved" and one was unimproved. Nine women received the combined therapy, eight have complete remission and one was "improved."

Public Health Reports, Washington, D. C.

54: 1663-1708 (Sept. 15) 1939

- The National Health Survey: Scope and Method of Nationwide Censuses of Sickness in Relation to Its Social and Economic Setting. G. St. J. Perrott, C. Tibbitts and R. H. Britten.—p. 1663.
Two New Species of Opisthorchis (Siphonaptera). N. E. Good and F. M. Prince.—p. 1687.

Radiology, Syracuse, N. Y.

33: 261-420 (Sept.) 1939. Partial Index

- "Electric Eye" to Determine Regional Densities (Silicosis) and Use of W. G. Cole, New York.—p. 261.
Primary Ulcer of Jejunum. J. Buckstein, New York.—p. 299.
Bone Rarefaction After Trauma to Large Joint Regions Without Fracture. H. L. Jaffe, New York.—p. 305.
Tangential Irradiation of Breast Carcinoma. N. S. Finzi, London, England.—p. 312.
Chronic Recurrent Intestinal Intussusception. M. G. Wasch and B. S. Epstein, Brooklyn.—p. 316.
X-Ray Therapy in Treatment of Acute Pneumonia: Report Covering Use of X-Ray Therapy in Treatment of Pneumonia at the Niagara Falls Memorial Hospital from Oct. 1, 1937, to Sept. 30, 1938. W. R. Scott, Niagara Falls, N. Y.—p. 331.
Lipiodol Granuloma in Fallopian Tubes Localized by Intra-Uterine Diiodrast Injection, with Special Reference to Value of Follow-Up X-Ray Films. I. C. Rubin, New York.—p. 350.
Hodgkin's Disease. L. J. Friedman, New York.—p. 354.
Consideration of Polycythemia and Grenz Ray Therapy. G. Bucky and J. Uttal, New York.—p. 377.
Importance of Sacro-Iliac Changes in Early Diagnosis of Ankylosing Spondylarthritis. Marie-Strümpell-Bechterew Disease. J. Forestier, Aix-les-Bains, France.—p. 389.

Roentgen Therapy for Pneumonia.—The results obtained with roentgen therapy in eighty-eight cases of acute pneumonia seen during a period of one year at the Niagara Falls Memorial Hospital, Scott believes, indicate that there is a definite field for this type of therapy. Whenever possible the patient

was treated immediately on admission to the hospital and before being taken to his room. The factors used were 75 kilovolts, 3 mm. of aluminum filter, 200 roentgens, an open lead glass bowl type of tube holder with a 15 cm. opening centering over the area of chief consolidation (determined by a previous roentgenogram) without a cone or other method of screening off the rest of the chest. In bronchopneumonia the treatment was usually centered over the area which showed most confluence of mottling but without exclusion of the entire chest. The ages of the patients varied from 3 weeks to 76 years. In the patients who passed through the x-ray department the mortality rate was approximately 4 per cent lower than the general hospital pneumonia death rate for the twelve months under consideration. Also there was a marked difference between the patients who were given roentgen therapy and/or roentgenographed for diagnosis and those who did not visit the x-ray department at all; that is, the difference between 19.5 (including the eighty-eight patients who were given roentgen treatment and fifty of whose chests roentgenograms only were taken) and 44.1 per cent. Patients frequently look better and feel better within a short time after the treatment. It frequently happens that a definite fall in temperature occurs in from twelve to twenty-four hours after treatment, subsequently followed by a rise or occasionally by a rise showing two peaks, but then the temperature may proceed rather rapidly to normal. If the patient appears better, whether the temperature shows an abrupt drop or not, his clinical appearance is considered rather than temperature record and he is not treated for two or three days unless there seems to be need for it. Often by this time the temperature is going down and no further treatment is necessary. A second treatment was needed in only a few cases. The rapid improvement in the condition of most patients who had roentgen therapy early was frequently startling. Averaging the eighty-eight cases, a death rate for all cases in which any type of roentgen treatment was given, no matter what else was done, was 19.3 per cent. The average hospitalization time for the 138 cases of pneumonia was 15.9 days for males and 13.9 days for females. The hospital time of a patient treated chiefly by roentgen therapy was definitely shorter than the time required by one receiving roentgen and other methods of treatment; approximately one half the time. If the length of hospitalization is cut in half, certainly the cost to the patient is cut. The frequency of complications definitely seemed to be lessened. As long as the patients were even roentgenographed the death rate was lower; as compared to patients not even roentgenographed the percentage in favor of some form of roentgen therapy seems almost incredible. Contraindications appear to be nil, whereas other types of medication, especially serum, may be definitely contraindicated. Any other treatment desired by the attending physician may be given in conjunction with roentgen therapy. No reactions to the treatment were observed. Further reports on this problem are necessary to estimate accurately the value of roentgen therapy for pneumonia.

Sacro-Iliac Changes in Spondylarthritis.—After reviewing 153 cases of ankylosing spondylarthritis, some of which have been followed for many years, Forestier declares that: 1. The condition occurs rarely in women. 2. Patients frequently give a previous history of genital infection: prostate seminal vesicles or rectosigmoidal disturbances. 3. The disease has a low-grade evolution; the onset is often difficult to determine. It progresses upward from the pelvis to the cervical region and to the lower joints of the extremities. 4. The x-ray changes in the sacro-iliacs are contemporary of the early and confused low back symptoms and precede, in most cases, vertebral involvement. From these deductions the author presents a pathogenesis of the disease which he believes may explain completely its special features. He believes that the primary focus in ankylosing spondylarthritis is in the genito-urinary system or in the lower intestine and that the toxic products excreted by this focus are drained into the lymphatic system of the pelvis and from here alongside the spine. In a man, the lymphatic vessels from the prostate and the seminal vesicles pass, on both sides of the medial line, in front of each sacro-iliac joint and extend upward in the posterior part of the abdomen on both sides of the spinal column just in front of

the apophysial joints, with which they have many connections. They are directly applied on the vertebral column behind the aorta and the vena cava. In a woman, the lymphatic vessels of the uterus and the vagina follow approximately the same path and also lie near the intervertebral joints. Conversely, the lymphatic vessels of the fallopian tubes and of the ovaries are much more laterally situated in the pelvis, and when they come up into the abdomen they lie on the ventral aspect of the large blood vessels—the aorta and vena cava. Since the draining of the uterus and vagina is far easier than that of the ovaries and tubes, the infrequent occurrence of ankylosing spondylarthritis among women can be understood. This theory, the author believes, explains the slow progress of the disease, first to the sacro-iliac joints and later ascending along the different segments of the spine. The sacro-iliac joints were roentgenographically involved in more than 98 per cent of the 153 cases. From the x-ray examination of twelve cases observed in the early stages of the disease, evidence is given that sacro-iliac joints are involved previously to any changes of the spine. The reverse has not been observed.

Rocky Mountain Medical Journal, Denver

36: 685-748 (Oct.) 1939

- Is the Child Ready for School? E. Jackson, Denver.—p. 703.
Causes of Dizziness. K. G. Cooper, Denver.—p. 703.
Transurethral Prostatic Resection. H. Buchtel, Denver.—p. 708.
Essential Hypertension: General Consideration and Surgical Treatment by Resection of Splanchnic Nerves and Celiac and First and Second Lumbar Ganglions and Intervening Trunks. W. R. Lipscomb, Denver.—p. 715.

Southwestern Medicine, El Paso, Texas

23: 281-318 (Sept.) 1939

- Malignancies of Female Genital Tract. J. W. Cathcart, El Paso, Texas.—p. 281.
Medical Control of Silicosis. F. T. Hogeland, Cananea, Sonora, Mexico.—p. 284.
Proctology for the General Practitioner. W. H. Daniel, Los Angeles.—p. 287.
Diabetes Mellitus: Analysis of Cases Treated with Protamine Zinc Insulin. L. B. Smith, Phoenix, Ariz.—p. 289.
Angina Pectoris and Its Masquerades. G. Werley, El Paso, Texas.—p. 294.
Case Specific Bacterial Vaccines. O. H. Brown, Phoenix, Ariz.—p. 297.
Gastroscopy as Diagnostic Procedure. N. Giere, El Paso, Texas.—p. 299.

Tennessee State Medical Assn. Journal, Nashville

32: 303-338 (Sept.) 1939

- Acute Abdominal Emergencies: Report of Some Interesting Cases. J. B. Haskins, Chattanooga.—p. 303.
A Doctor Looks at Socialized Medicine and Raises the Question: Shall the First Aim of Medical Service Be Quality or Quantity? E. L. Shore, Atlantic City, N. J.—p. 314.
Leukemia. R. H. Monger, Knoxville.—p. 319.

Texas State Journal of Medicine, Fort Worth

35: 325-384 (Sept.) 1939

- Rabies. G. K. Wassell, Dallas.—p. 330.
Varying Virulence of Hemolytic Streptococci: Determination of Serum Sulfanilamide. T. W. Folbre, San Antonio.—p. 336.
*Atypical Pneumonia with Leukopenia. J. R. Maxfield Jr., San Francisco.—p. 340.
Use of Sulfapyridine in Pneumonias of Early Life. H. L. Moore, Dallas.—p. 346.
Rocky Mountain Spotted Fever: Report of Case. W. S. McDaniel, Houston.—p. 348.
*Tularemia: Report of Case Treated with Sulfanilamide and Antiserum. G. L. Powers and Evelyn Gass Powers, Amarillo.—p. 350.
Drugs in Treatment of Congenital Syphilis. J. E. Ashby and H. Moore, Dallas.—p. 353.
Evaluation of Endocrine Therapy in Menstrual Disorders. H. R. Robinson, Galveston.—p. 357.
Review of 2,422 Cases of Contraception. J. Z. Gaston, Houston.—p. 365.
Maternal and Child Health Demonstration Program in Health Education. J. M. Coleman, Austin.—p. 368.
Recurrent Familial Headaches (Migraine). V. R. Hurst, Longview.—p. 372.

Atypical Pneumonia with Leukopenia.—Maxfield states that recently sixty-three cases of an atypical pneumonia with leukopenia have been seen in Baylor Hospital, Dallas, Texas. These pneumonias seem to be a clinical entity. There was usually a prodromal stage of from five to ten days. The disease started with dryness of the throat and some soreness. The symptoms of a mild upper respiratory infection, general malaise and mild to severe headaches were observed. The patient became progressively worse. A rapid change with onset of fever and usually a chilly sensation then occurred.

Pain and fulness in the chest often occurred at this time. The patient's face showed anxiety and there was an elevation of temperature (from 102 to 104 F.) and an increase in the pulse and respiratory rate. There was usually a productive cough frequently accompanied by hemoptysis, which was followed in a few days by a coarse, dry, nonproductive cough which persisted even after the temperature returned to normal. This occurred between the fifth and the tenth day after admission. Although a diligent effort has been made, the causative organism has not been determined. A virus is strongly suspected. Repeated examinations of the sputum revealed acid fast organisms in only one instance and this patient had a previous history of tuberculosis. Repeated throat cultures and smears showed only normal organisms of the mouth and throat, with a gram-negative short chain nonhemolytic streptococcus in a few cases. In a few instances pneumococci were found. When these pneumococci were typed, no capsular swelling was observed with types I through XXXII of the Neufeld pneumococcus typing serum. The blood picture was that of a mild leukopenia, varying from 4,000 to 12,000 leukocytes per cubic centimeter of blood, with 82 per cent of the cases giving a leukocyte count of less than 8,000. The mononuclear leukocytes were 8 per cent or above in 38 per cent of the cases. The neutrophils varied from 40 to 80 per cent, the average being 61 per cent. A communicable factor was present, since the disease developed following contact with patients in eight nurses, four interns and three of the attending staff of Baylor Hospital. Two of the patients had a relapse, one four weeks and one three months after discharge from the hospital. The x-ray appearance of the lesions was usually infiltrative in character. They had feathery, indefinite edges with moderate homogeneous density toward their inner portions. The size of the lesions varied from those that were barely demonstrable in the roentgenograms to an almost complete involvement of both lung fields. Those cases with involvement of more than one lobe showed no increase of symptoms. There was a wide variation in the location and appearance of the lesions. Therapy was of a symptomatic and expectant nature. However, tincture of benzoin inhalations, steam inhalations, sulfanilamide, blood transfusions, nonspecific protein therapy and opiates for pain and persistent cough and the like were used. There were no mortalities. The duration of symptoms did not seem to be either shortened or lengthened by the type of treatment used. The author feels that the prognosis is good in all cases so long as the leukopenia exists and repeated bacteriologic studies fail to reveal typable pneumococci, tubercle bacilli, virulent streptococci or viruses of influenza, psittacosis or others. In the differential diagnosis typhoid, undulant fever, psittacosis, tuberculous pneumonia, influenza, influenzal pneumonia, tularemia and coccidioid granuloma should be considered.

Tularemia.—In reporting their case of tularemia, G. L. and Evelyn Powers wish to call attention to the fact that the disease occurs in all parts of the United States. They believe that theirs is the first case in which treatment with sulfanilamide and antiserum was successful.

Wisconsin Medical Journal, Madison

38: 709-840 (Sept.) 1939

- Gastrointestinal Disturbances Among Infants and Children. R. L. J. Kennedy, Rochester, Minn.—p. 727.
*Angina Pectoris and Tobacco Smoking: Presentation of Three Cases with Electrocardiographic Records. B. J. Birk and H. H. Huber, Milwaukee.—p. 733.
Perforating Hemorrhagic (Chocolate) Cysts of Ovary. C. B. Hatleberg, Chippewa Falls.—p. 736.
Results of Routine Examinations of Candidates for Teachers' Certificates at the University of Wisconsin, 1937-1938. L. R. Cole, Madison, and P. H. Schmiedekne, Mariette.—p. 740.
Significance of Hematuria. H. L. Kretschmer, Chicago.—p. 742.

Angina Pectoris and Tobacco Smoking.—Three patients exhibiting the syndrome of angina pectoris caused by smoking were seen by Birk and Huber. They obtained electrocardiograms when the patients sought relief from their symptoms and again when the underlying offending factor (smoking) was removed, after which the electrocardiograms were normal and the patients felt well. The changes noted in the electrocardiograms were definite. One of the patients with angina pectoris caused by tobacco smoking was a woman.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

36: 171-250 (July-Sept.) 1939

- Diphtheritic Infection of Umbilicus. A. R. Thompson.—p. 171.
Congenital Abnormalities of Gallbladder and Extrahepatic Ducts: Review of 245 Reported Cases with Reports of Thirty-One Unpublished Cases. E. Stolkind.—p. 182.

British Medical Journal, London

2: 631-670 (Sept. 23) 1939

- Significance of Auditory and Visual Hallucinations. P. K. McCowan.—p. 631.
Neurologic Aspect of Visual and Auditory Hallucinations. M. Critchley.—p. 634.
*Puerperal Sepsis and Hemolytic Streptococci. Amy M. Fleming.—p. 639.
Ophthalmic Services to Civil Population in National Emergency. A. Sorsby.—p. 641.
*Sulfanilamide in Treatment of Scarlet Fever. E. C. Benn.—p. 644.

Puerperal Sepsis and Hemolytic Streptococci.—Since evidence is accumulating that the upper part of the respiratory tract of the patient herself or her contacts is the most probable source of puerperal infection with hemolytic streptococci Fleming, with a view of preventing the transfer of these organisms to the genital tract of pregnant women immediately before, during and after childbirth, determined the incidence of group A hemolytic streptococci in 120 women medical students before they began their work in the maternity wards of the obstetric and gynecologic unit of the Royal Free Hospital. In each case the throat swab was taken about three weeks before the student was due for her two and a half months of resident training in the hospital. If a growth of streptococci was found, McLeod's test was carried out to see if it showed soluble hemolysin, and, if it did, the Lancefield group to which the hemolytic streptococci belonged was ascertained by the precipitin reaction. A growth of hemolytic streptococci was obtained in 22.5 per cent of the cases. In only five of the 120 students examined—that is, in 4.2 per cent—did the hemolytic streptococcus belong to the Lancefield group A. The series, spread over two years, gave no evidence of any seasonal variation in the frequency of the carrier rate of all hemolytic streptococci or of Lancefield group A. There was no evidence of any relation between the incidence of hemolytic streptococci in the throat belonging to group A and the presence of tonsillar tissue. Complete tonsillectomy had been performed in about 50 per cent of the students. Hemolytic streptococci were absent in as large a proportion of students with tonsils or remnants of tonsils as of those in whom complete tonsillectomy had been performed. Each student with hemolytic streptococci was given leave of absence, and moderate exercise in the open air, painting or gargling of the throat or the administration of sulfanilamide compounds was recommended. Whenever it ceased to be possible to grow group A streptococci from their throat swabs the students were considered fit to begin their residence. The time required for treatment varied, but the persistence of the positive throat swab was noticeable in those students whose nasopharynxes were in an unsatisfactory condition. From an inquiry into the medical work previous to obstetrics there seems ground for the suggestion that the curriculum of medical students should be so arranged that work in the children's wards should not immediately precede or be contemporary with work in obstetrics unless special steps are taken to control the carrier rate in the children's wards. Those in contact with respiratory ailments should exercise particular care, with the knowledge that their own susceptibility to act as carriers of group A hemolytic streptococci may be an important factor in the transmission of the infecting organism of puerperal fever. Only on four occasions during these two years, when throat swabs were examined because puerperal pyrexia had developed in a patient, were hemolytic streptococci found in the patient's throat. The same strain of hemolytic streptococci was isolated from the cervix of one of the patients and also from the throats of a student and a nurse in contact. In only one of the other cases was a student found to be a carrier. It appears that routine examination of throat swabs of the medical and nursing staffs is indicated.

Sulfanilamide for Scarlet Fever.—Since January 1937 Benn treated 256 patients with scarlet fever with sulfanilamide (Bayer), and 261 control patients were simultaneously treated

without the drug. Antiscarlatinal serum was given to those patients in both groups who were thought to require it, irrespective of the sulfanilamide. It was realized that sulfanilamide has little or no effect in the acute febrile stage of scarlet fever, except perhaps in patients with a frankly septic type of the disease; therefore it was thought that the incidence of complications (which occur more often in children less than 10 years of age) would probably give the best indication of the value of the drug. The general treatment of the patients did not differ in the two groups. The amount (divided into three equal doses in twenty-four hours) of sulfanilamide, after a previous trial period, was fixed at 0.75 Gm. for children less than 2 years of age, 1.5 Gm. for children from 3 to 7 and 3 Gm. for those from 8 to 10. Administration of the drug was continued until the temperature had been normal for a week in uncomplicated cases. If complications developed, administration was prolonged for as long as was indicated. Signs of sulfanilamide toxemia were seen infrequently and in no case gave rise to anxiety. All patients suffered from simple scarlet fever, and no death occurred in either series. The early acute stage of scarlet fever seemed to be uninfluenced by sulfanilamide except in cases in which some septic element was apparent: The subseptic patients appeared to benefit from the drug. There were a total of forty-eight complications in the test group as compared to eighty-one in the control group. Individual complications, with two exceptions, showed a greater frequency in the control group than in the test group, and certain complications, including rheumatism, endocarditis and myocarditis, were absent from the test series but present in the control cases. The incidence of suppurative otitis media was greater in the control series than in the test series, 10.3 and 6.3 per cent, respectively. It appears that an important action of sulfanilamide in the mild type of scarlet fever is prophylactic in that it lowers the incidence of complications. For this reason seventy-nine patients have been given 1 Gm. of sulfanilamide daily, in four equal doses, from admission until the fourteenth day and again from the twenty-first to the twenty-eighth day. The results in these seventy-nine are sufficiently good (there were only four cases of suppurative otitis media, two of adenitis, two of paronychia and one of albuminuria) to encourage further prophylactic trial. The most striking effect is the comparative absence of the many minor septic sequelae. Cyanosis was not encountered in this group, but a maculopapular erythema of morbilliform type, which first appeared on the extremities, then on the face and finally on the body, occurred in two cases. In one patient this was accompanied by pyrexia, which subsided within forty-eight hours after the drug was withdrawn. No other toxic effects were encountered.

Lancet, London

2: 675-722 (Sept. 23) 1939

- Inoperable Carcinoma of Rectum. D. C. L. Fitzwilliams.—p. 672.
*Treatment of Epilepsy with Sodium Diphenyl Hydantoinate. D. Williams.—p. 678.
Chemotherapy of Experimental Anthrax Infection. J. C. Cruickshank.—p. 681.
Action of Sulfonamides in Experimental Anthrax. H. B. May and S. C. Buck.—p. 685.
Complete Heart Block in Young People: Report of Two Cases. H. J. Bower.—p. 686.
*Stilbestrol and Anhydro-Oxyprogesterone: Their Effects on Menstruation and Lactation. R. Wenner and K. Joël.—p. 688.

Sodium Diphenyl Hydantoinate in Epilepsy.—Williams decided to try treatment with sodium diphenyl hydantoinate in ninety-one patients with chronic epilepsy who had ceased to respond to other anticonvulsants. The patients all lived at home and had been under regular observation and treatment with other drugs for an average of 6.4 years. The longest continuous period of treatment with sodium diphenyl hydantoinate was ten months and the shortest six weeks, the average duration in eighty-three cases being 4.1 months. Sodium diphenyl hydantoinate was given in capsules of 0.1 Gm. An initial daily dose of 0.2 or 0.3 Gm. was slowly increased, and 0.6 Gm. daily was given in some cases. Phenobarbital and bromides were continued in decreasing doses during the period of substitution, and it was sometimes necessary to reduce the dose of sodium diphenyl hydantoinate and to supplement it with other anticonvulsants. After trial of the drug alone the following medications were found to give an optimum therapeutic effect: sodium diphenyl hydantoinate alone in fifty-two cases, combined with

phenobarbital in nine cases, with bromides in sixteen cases and with phenobarbital and bromides in six cases. As a result of this treatment the fits were reduced in frequency in 79 per cent of the subjects with grand mal and in 63 per cent of those with petit mal. In 19 per cent the improvement was dramatic and has been maintained for over five months. Toxic symptoms arose in 36 per cent, and two patients died in status epilepticus while receiving the drug. The drug seems to be of value in the treatment of epilepsy in some cases when other forms of treatment have failed, but there are no indications that it should supersede the less toxic anticonvulsants in the initial stages of treatment. Its administration requires careful observation of the patient.

Stilbestrol and Anhydro-Oxyprogesterone in Menstruation and Lactation.—Wenner and Joël say that although all investigators agree about the similarity of the properties of stilbestrol to those of the estrogenic hormone, emphasis is constantly laid on the yet unresolved question of dosage. They sought to ascertain (1) the minimal dose necessary to produce proliferation in a resting or atrophic endometrium, (2) the dose necessary to induce a hyperproliferation (in the sense of glandular cystic hyperplasia), and (3) the doses necessary to prevent and to inhibit lactation in the puerperium. At the same time they tried to ascertain the oral dose of corpus luteum hormone (anhydro-oxyprogesterone) necessary to produce the stage of transformation of the endometrium with subsequent menstruation. The authors studied the effect of stilbestrol and of anhydro-oxyprogesterone on the endometrium of one woman who had attained the climacteric thirteen years earlier and on eight women who had been castrated by means of roentgen treatments two or three years previously, when they were over 45 years of age. Each woman was subjected to three curetages: one before treatment was begun, the second after the administration of stilbestrol and the third after treatment with anhydro-oxyprogesterone. They found that in order to obtain proliferation of a resting or atrophic endometrium, it is necessary to give 25 mg. of stilbestrol by mouth or 15 mg. by intramuscular injection. If from 50 to 60 mg. of stilbestrol is given by mouth, a glandular cystic hyperplasia can be produced. The stage of transformation and the menstruation following proliferation can be produced by the oral administration of from 220 to 300 mg. of anhydro-oxyprogesterone. In only two cases did the administration of stilbestrol cause slight secondary symptoms, and even these disappeared rapidly. In the second part of this report the authors describe their studies on the effects of stilbestrol on lactation. Since several investigators had succeeded in either preventing the influx of milk or inhibiting lactation by the administration of estrogenic hormone, the authors decided to use stilbestrol for the same purpose. In six cases (four stillbirths, one case of tuberculosis and one of depressed nipples) they administered stilbestrol on the first day after confinement to prevent the secretion of milk. In three of these cases one tablet (5 mg.) was given and in the other three, two tablets (10 mg.). The treatment was successful in all of these cases; no milk was secreted, and the breasts remained flaccid. In fourteen cases stilbestrol was given to inhibit established lactation, the indications being hypogalactia, bleeding fissures, mastitis, eczema of the breasts and tuberculosis. It was found that to arrest lactation, from 5 to 10 mg. of stilbestrol is usually effective, but in some cases larger doses are necessary (not more than 20 mg.). All women took stilbestrol without difficulty, and no secondary symptoms were observed.

Medical Journal of Australia, Sydney

2: 345-382 (Sept. 2) 1939

- Emotional Factors in General Medicine. Anita M. Mühl.—p. 345.
Review of 120 Cases of Bronchiectasis in Children in New South Wales. C. Selby.—p. 352.
General Paralysis of Insane in Victoria. F. G. Prendergast.—p. 361.

South African Medical Journal, Cape Town

13: 587-632 (Aug. 26) 1939

- "As Others See Us: Doctors and Patients." E. G. D. Drury.—p. 589.
The Hospital Dietitian. G. M. Sedgwick.—p. 595.
Alcohol Injection of the Gasserian Ganglion. A. J. de Villiers.—p. 598.
Incidence of Appendicitis in the Bantu: Some Observations on Its Pathology as Seen in Series of Cases. J. F. P. Erasmus.—p. 601.
Congenital Defect of Sternum. C. J. H. Brink.—p. 606.
Current Views on Gallbladder Disease. J. S. Alexander.—p. 608.
Luxation of Innominate Bone: Case. S. V. Humphries.—p. 611.

Strasbourg Medical

99: 291-302 (Aug. 5) 1939

- *New Conceptions on Essential Epilepsy, Its Pathogenesis, Familial Existence and Prophylactic Measures. J. Wertheimer.—p. 291.
Tumor of Left Frontal Lobe: Case. Hélène Weiss.—p. 297.

New Conceptions on Essential Epilepsy.—According to Wertheimer, the term essential or idiopathic epilepsy does not designate a nosologic entity but is generally applied to all cases of epilepsy in which neither the clinical examination nor the history reveals exogenic factors as cause of the attacks. He concludes that essential epilepsy is a sequel of obstetric intracranial lesions, especially of intracranial hemorrhages, which may have escaped observation because their symptoms were slight. Intracranial hemorrhages are often caused by the use of forceps, that is, in extremely retarded deliveries, but they occur also as sequels of extremely rapid deliveries. Studies on the course of labor in epileptic women revealed a high incidence of the precipitate type of deliveries. Thus the infants from epileptic mothers are especially predisposed to intracranial hemorrhages and their consequences. The author shows that this circumstance may give rise to the familial and apparently "hereditary" appearance of epilepsy. However, he maintains that a hereditary epilepsy in the biologic meaning of the term "hereditary" does not exist, the apparent heredity being a result of a vicious circle. After giving the clinical histories of five children he stresses that, as a result of the dorsal position of the nursing, the blood discharged during the cranial hemorrhages settles in the occipital region and remains there like a foreign body until it gradually becomes organized, which may require several months. The cicatrization resulting from this process may produce epileptic attacks. The ventral position of the nursing, on the other hand, facilitates cranial circulation, favors the resorption of the sanguine effusion and thus avoids the cicatrization and the subsequent epilepsy. Placing the nursing in the ventral position is a prophylactic measure against the frequently disastrous sequels of obstetric meningo-encephalic hemorrhages.

Helvetica Medica Acta, Basel

6: 415-524 (Aug.) 1939

- Spinal Funiculitis in Endemie Sprue. H. W. Hotz and F. Lüthy.—p. 415.
Perforation of Interventricular Septum by Infarct. G. Bickel and J. J. Mozer.—p. 427.
Insuloma of Extremity of Pancreas: Case; Can Carcinoma be Caused by Induction? H. Dubois-Ferrière.—p. 458.
*Quantity and Distribution of Hepatic Glycogen in the Newborn. J. Fopp.—p. 466.
Demineralization of Bone Extremities After Trauma Incurred in Accidents as Partial Symptoms of Dystonia and Dystrophy of Extremities. U. Frutiger.—p. 480.

Hepatic Glycogen in the Newborn.—Fopp studied the glycogen content and distribution in late fetal and neonatal livers in eighty cases: twenty-four fetuses with an intra-uterine existence from seven to nine months, the remainder (fifty-six) consisting of infants either stillborn or dying within the first twenty-four hours. The majority of the necropsies were performed during the second or third day on bodies kept in refrigeration. Portions of the liver 0.5 cm. in thickness were steeped in a 95 per cent solution of alcohol, embedded in celloidin and tinted according to the Bestsch method. In addition, control analyses were made on fifteen infants who had died within the first month. The results obtained showed glycogen content in the combined late fetal and neonatal livers (eighty) in the following proportions: no glycogen 26 per cent (twenty-one), little glycogen 24 per cent (nineteen), intermediate group 25 per cent (twenty), much glycogen 25 per cent (twenty). The glycogen content for the fetal group taken by itself (twenty-four) indicated about the same percental proportion as for the combined group: no glycogen 21 per cent (five), little glycogen 29 per cent (seven), intermediate group 25 per cent (six), much glycogen 25 per cent (six). These results warrant the inference, confirmatory of the studies made by others, that the glycogen content is often high in fetal livers but give no support to the assumption that high glycogen presence is the "norm." In comparison with the data obtained for the livers of unslected healthy adults accidentally killed, the glycogen content was more frequent and pronounced. On the other hand, tests on the fifteen controls clearly indicated

loss of glycogen, only five attaining to intermediate and high rating. These indications, according to the author, point to a special stability of glycogen retention in neonatal livers and were confirmed by consecutive testings especially made on the liver of another newborn infant at intervals between one and one-half and forty-eight hours. Morphologically, the author finds a close analogy between the glycogen in fetal and neonatal livers and that of adults, with the exception of a complete absence of nuclear glycogen, which he accounts for by the absence of acidosis. Observations made on the hepatic cells of adults could be verified in the livers of the newborn. Evidence for glycogen distribution in the lobule was too conflicting to admit of generalized inferences. Differences between neonatal and adult livers may be due to pathologic processes in adult livers. The author does not seek to explain the great loss in the glycogen content of neonatal livers on a uniform basis. Factors such as prolonged labor, intra-uterine antepartum death, premature detachment of the placenta, febrile infection, marked fatty degeneration and blood congestion in the liver, causing enlargement of the central veins and capillaries, may all cause glycogen impairment while congenital goiter, thymus hyperplasia, sex and the number and size of hemopoietic hepatic centers, except in fetal myeloblastosis, seem not to affect the glycogen content. The evidence for the effect of the size of the liver on glycogen is too meager to justify conclusions.

Schweizerische medizinische Wochenschrift, Basel

69: 805-824 (Sept. 9) 1939. Partial Index

- Marble Bone Disease. A. Willi.—p. 805.
*Effects of Ketogenic Diet. M. Julez and E. Winkler.—p. 807.
Diazotization Speed of Blood Serum. A. Gigon and M. Noverraz.—p. 811.

Ketogenic Diet in Asthma.—Julez and Winkler studied the effects of a ketogenic diet on fourteen patients (twelve asthmatic) with four healthy persons as controls. Concluding from earlier experiences of their own and others that neither acidification nor dehydration was the key to the problem, the authors turned from investigating the bicarbonate content of the blood to the analysis of ammonia secretion, with the purpose of obtaining a better insight into the metabolic disturbances caused by asthma and into the processes whereby effects are secured through a ketogenic diet. The conditioning of the controls included a standard diet, administration of phosphoric acid, a ketogenic diet for from one to two weeks and repeated tests for ammonia and alkali reserve. In their preliminary assays the authors discovered, on the average, no quantitative difference in ammonia secretion between the controls (650 mg.) and the asthmatic patients who had been put on a standard diet for three days (630 mg.); according to the literature ammonia elimination varies between 400 and 600 mg. Neither did phosphoric acid have any appreciable effect on the daily quota of ammonia excretion. In their study of the effect of a ketogenic diet on ammonia excretion the authors found that in the non-asthmatic controls ammonia elimination during the ketogenic diet was increased by 45 and 50 per cent as compared with the standard diet, continued for from one to two weeks with acetoneuria and then decreased, at which time not even increased ketosis could enhance ammonia excretion. The authors differentiate four kinds of ketogenic diet effect on ammonia secretion of asthmatic patients: 1. In patients with normal ammonia secretion under conditions of normal diet, the ketogenic diet increases ammonia secretion considerably. 2. In patients in whom absolute ammonia elimination is normal, the ketogenic diet does not increase it. 3. In patients whose ammonia elimination on a standard diet is subnormal, the ketogenic diet considerably increases it. 4. In patients whose ammonia elimination is subnormal, the ketogenic diet does not affect it. A ketogenic diet was found effective only in patients belonging to groups 1 and 3. Those in groups 2 and 4 were patients affected with serious forms of asthma and were not benefited by the ketogenic diet. In their investigations of the ketogenic diet on the alkali reserve—the latter being defined as the sodium bicarbonate content in the plasma expressed in cubic centimeters of carbon dioxide obtained from 100 cc. of plasma—the authors ascertained that the ketogenic diet diminished the alkali reserve both of

asthmatic and of nonasthmatic persons by from 1 to 20 per cent. The exceptional detection of an increased alkali reserve after from one to two weeks of the ketogenic diet, amounting in one case to 24 per cent, is explained by the authors on the assumption that the organism, under the influence of the ketogenic diet, adjusts itself so much to neutralizing acidity by means of ammonia that after a time it impairs its power to neutralize with bicarbonate. They appeal for confirmation of their assumption to the results obtained from the phosphoric acid administration during the conditioning period and to the abnormal reaction of some of the asthmatic subjects.

Archivio Italiano di Chirurgia, Bologna

56: 237-338 (May) 1939. Partial Index

- Regional Enteritis. E. Ragnotti.—p. 237.
Importance of Circulation on Formation of Bone Callus: Experiments. M. M. Reggiani.—p. 272.
*Abdominal Syndromes from Adenopathies of Mesentery. A. Parini.—p. 314.

Abdominal Syndromes from Mesenteric Adenopathies.—According to Parini there are certain acute forms of adenopathies of the mesentery with symptoms simulating those of acute appendicitis and also forms with abscess formation and possible rupture of the abscess and consequent peritonitis. The condition is generally found in children and adolescents, although it may be seen in adults. The enlarged mesenteric lymph nodes can be felt by palpation only in rare cases. The differential diagnosis of mesenteric adenopathies with acute appendicitis is made from the type of pain, which is of an intermittent character and located in the ileocecal or periumbilical region rather than in the appendicular region. The presence of leukocytosis with lymphocytosis is of diagnostic value. Mesenteric adenopathies may be secondary to tuberculosis, chronic inflammation of certain abdominal organs, or else chronic infection of the throat, teeth, respiratory tract or intestine. The treatment is etiologic, namely chemotherapy, especially sulfanilamide, in infection and medical, physical and other treatments in tuberculous adenopathies. In the latter the treatments indicated are administration of iodide, exposure of the patient to sun irradiations, administration of roentgen irradiations, sojourn of the patient in the proper climate and proper diet and general hygiene. Surgical intervention is indicated only in acute forms in the presence of (1) intestinal obstruction or stricture from compression of the enlarged lymph nodes or from adhesions, (2) acute suppuration, especially if there is a menace of rupture of a lymphatic abscess, or (3) peritonitis from rupture of an abscess. It is advisable to establish ample drainage after the operation. It is also advisable to resort to surgical intervention only in the specified conditions mentioned, since removal of enlarged lymph nodes may be followed by production of hemorrhages or development of necrosis, suppuration or formation of adhesions. Five cases of either the tuberculous or the infectious etiology are reported by the author.

Giornale Medico dell'Alto Adige, Bolzano

11: 241-308 (May) 1939. Partial Index

- Roentgen Examination in Study of Intestinal Occlusion from Ascariasis. A. Barbieri.—p. 241.
Variations of Glycemia in Relation to Peristalsis and Gastric Tonus. A. Baue.—p. 260.
*Treatment of Open Fractures. A. Chintellino.—p. 283.

Treatment of Open Fractures.—Chintellino has treated more than fifty cases of open fractures in the course of the last four years. The group included open fractures of the large bones (with exposure of the articular cavity in some cases) and open and comminuted cranial fractures. There were some diabetic and old persons in the group. The treatment, a modification of Böhler's, consists of surgical disinfection of the soft parts of the wound and of the bone tissues followed by complete suture of the wound. The operation is performed in the following manner: General care is given to the patient to prevent development of traumatic shock. The local region of the skin is sterilized with iodine (without any previous irrigation on the wound and nearby tissues). Anesthesia by infiltration is abundantly administered by using a 0.25 per

thousand solution of nupercaine. A roentgenogram of the fracture is made. All contused and contaminated tissues of the wound are removed and the edges of the wound are cleansed and made regular. The bone fragments are surgically disinfected, the small fragments are removed and those of moderate and large size are replaced. Ligation is done only when there are sectioned nerves or sectioned blood vessels. No foreign matter (of osteosynthesis or sutures) is left in the focus of the fracture. The skin is then sutured with silk stitches. In some cases it is advisable to leave one or various draining tubes. If so, they are placed in an inclined position. In fracture is then reduced and the limb immobilized in a cast with a window over the wound. In some cases transskeletal traction can be resorted to for the first twenty days, after which the fracture is managed as a closed fracture. In some of the author's cases the articular cavity was open and was treated by detersion with swabs soaked in ether. Cranial fractures were complicated in four cases by opening of the frontal sinuses, which were properly treated during the operation. Osteomyelitis of the bone fractures did not take place in any case, the process of healing was uncomplicated and both healing and regaining of use of the limb took no longer than when treated by any other method employed in open fractures. The author considers this the treatment of choice for open fractures.

Deutsches Archiv für klinische Medizin, Berlin

- 184: 369-488 (Aug. 1) 1939
*Anemia in Renal Diseases: Catabolism of Blood in Patients with Pale Hypertension and in Transitional Forms from Red to Pale Hypertension. H.-E. Bock and Lotte Weyand.—p. 369.
Modification of Mineral Economy and of Lead Content in Acute and Chronic Lead Poisoning by Sodium Thiosulfate. Frida Schmitt and H. Lossie.—p. 405.
Clinical Significance of Weltmann's Coagulation Band. B. Brendel.—p. 433.
Formation of Fat from Carbohydrate in Fat Organs. K. Felix and W. Eger.—p. 446.
Value of Biologic Reactions in Alveolar Echinococcus. F. Henri.—p. 458.
Pneumonia Caused by Thomas Slag Meal. A. Kahlstorf.—p. 466.

Catabolism of Blood in Hypertension.—Bock and Weyand studied the exchange of the blood pigments of patients with pale hypertension, in whom the renal function was impaired, and in those who had transitional forms from red to pale hypertension. They employed Heilmeyer's method, which determines the urobilin elimination per hundred grams of circulating hemoglobin and designates the result as the "index of urobilin catabolism." However, they complemented Heilmeyer's method by determination of the resistance and by measuring the median diameter and the volume of the erythrocytes, the thickness determined the iron content of the serum and bone marrow and examined myelograms and the circulatory conditions. Summarizing their observations they say that five cases of malignant nephro-angiosclerosis (Volhard's pale hypertension) in which there was an average blood pressure of 213/129 mm. of mercury and with typical angiospastic retinitis showed a noticeable increase in the catabolism of the blood. The total mass of erythrocytes was decreased but the plasma was increased. The values for hemoglobin, erythrocytes and the color index indicated anemia. The erythrocytes were pale and thin; their volume was reduced although the plane diameter was normal. Since the increased catabolism of the blood was accompanied by only a slight increase in the percentage of reticulocytes and since they were all comparatively old cells with vital granulation, the authors assume rapid aging of the reticulocytes and a retarded elimination from the bone marrow. The tendency toward augmentation of the index of urobilin catabolism and toward the reduction in the total quantity of erythrocytes was the greater the more severe was the impairment of the renal function. In seven patients with an average blood pressure of 192 systolic, 98 diastolic who, on the basis of the changes in the fundus oculi, had to be regarded as belonging to the group with transitional forms from red to pale hypertension, the catabolism of the blood was found to be near or noticeably above the upper limits of normality. The total mass of erythrocytes was decreased, but there was hardly any compensatory increase in plasma and no increase in the total quantity of blood. In contradistinction to the patients with pale hypertension, these patients with the

transitional forms show no impairment of the hemoglobin content or the erythrocyte count. Their erythrocytes resemble morphologically those of the patients with pale hypertension. The reticulocyte numbers are higher and there are more young forms than in typical malignant sclerosis, that is, the compensatory functions are more favorable. In a patient with red hypertension in whom the pressure was 180/90 and the renal function good, the blood exchange was near the upper limit of normality and the mass of erythrocytes and of plasma was normal. There was no anemia and the percentage of reticulocytes was normal, as was also the form of the erythrocytes. Three patients with chronic glomerular nephritis with an average blood pressure of 160/88 and with a normal fundus oculi showed a greatly increased hematic catabolism, like the patients with nephro-angiosclerosis, and a greater reduction in the total mass of erythrocytes and plasma. The anemia of these patients was more severe than that of patients with malignant sclerosis, although the retention of urinal substances was less or even lacking. The authors believe that the factor which is most important for an increase in the catabolism of the blood is not the impairment of the erythrocytes in the presence of contracted vessels but rather the retention of urinal substances. They found that the greater the increase in indican, the greater is also the index of urobilin catabolism. To be sure, observations in several cases of nephritis and malignant sclerosis indicate that the factor of "renal insufficiency" is not necessarily delayed until after the indican test of the serum is positive. The author observed an increase in the catabolism of the blood and a decrease in the mass of circulating erythrocytes even in the absence of indicanemia. In cases of chronic nephritis the increased hematic catabolism was accompanied not only by an insufficient replacement of erythrocytes (as in cases of malignant nephrosclerosis) but also by an inadequate restoration of plasma.

Endokrinologie, Leipzig

22: 1-80 (July) 1939

- Pars Intermedia of Human Hypophysis and Remarks on Origin of Hypophysial Hormones. W. Berblinger.—p. 1.
Influence of Hypophysectomy on Minimal Dose of Testicular Hormone in Male Castrates. C. Müller.—p. 14.
*Investigations on Hormone of Lactation of Anterior Lobe of Hypophysis. K. Ehrhardt and H. F. Voller.—p. 19.
Investigations on Modification of Structure of Thyroid by Vitamin C. M. Schöber.—p. 24.

Lactation Hormone of Anterior Lobe of Hypophysis.—The investigations presented by Ehrhardt and Voller concern the presence of the hormone of lactation in the blood and urine. The hormone was extracted according to the method of Lyons and Page and was injected under the skin of the crop of young pigeons. In contradistinction to other investigators, the authors did not regard the appearance of so-called crop milk as indicator, but rather the microscopically demonstrable hypertrophy of the cutaneous papillae of the crop and the formation of secondary papillae. They first examined specimens of blood and urine, which were obtained from nulliparous women who had a regular twenty-eight day cycle. Further they investigated the occurrence of the lactation hormone in pathologic processes, such as abortions, and finally they tested the action of the hormone of lactation in guinea pigs. Summarizing their results, they point out that the occurrence of the hormone of lactation in blood and urine shows two maxima in the course of the menstrual cycle, one at the onset of menstruation and one at the time of the rupture of the follicle. Investigations in connection with the hormone of lactation appears in especially large quantities during processes of decomposition in the genital organs. In pregnant guinea pigs the hormone was found to have an abortifacient effect, but it was also possible to influence the inammary glands of pregnant guinea pigs in that they were brought prematurely into that stage which physiologically coincides with the "shooting in" of the milk. The authors suggest that the hormone of lactation not only exerts a specific action on the mammary tissue but probably has functional significance also in the menstrual process. This raises the question of the relationship of the hormone of lactation to the estrogenic hormone and to the corpus luteum hormone. The authors found that the hormone of lactation appears when the action of the two other

hormones ceases, which would seem to indicate that the processes in the female genitalia are influenced not only by the estrogenic and the corpus luteum hormones but at times also by the hormone of lactation. On the basis of their observations the authors suggest that lactation hormone of the anterior lobe of the hypophysis acts not only on the mammary gland but at times also on the ovary and the uterine mucosa in that it is involved in the rupture of the follicle and in the menstrual decomposition of the uterine mucosa.

Folia Haematologica, Leipzig

62: 337-480 (No. 4) 1939

- *Myelogenic Osteopathy: Clinical and Experimental Study. N. Markoff.—p. 337.
Cholesterol Content of Erythrocytes in Human Subjects. G. C. Brun.—p. 367.
Complex of Symptoms of Pannmyelophthisis During Childhood. T. Illing.—p. 369.
Experimental Changes in Opsonic Index. V. Papilian and I. G. Russu.—p. 392.
*Blood Picture During Alarm Reaction. A. J. Dalton and H. Selye.—p. 397.
Problem of Megaloblasts. H. E. Bock and B. Malamos.—p. 408.
Experiences with Coagulation According to Weltmann at Medical Clinic of University of Zurich. T. Keller.—p. 430.

Myelogenic Osteopathy.—Markoff directs attention to recent advances in the knowledge on the relationship between osteal and medullary structure and functions, pointing out that the intravital examination of the bone marrow according to Arinkin's method permits an evaluation of the morphology and function of the medullary tissue. A comparison of the osteal structure and of the morphology and function of the medullary tissue shows a coupling between medullary and osteal changes under physiologic and under pathologic conditions. This connection is designated by the author as the medullary-osteal relation. Functional activity and morphologic aspects run parallel under physiologic conditions, though a study of the various forms of osteopathy reveals a diverging development between osteal and medullary changes. The author gives his attention to the medullary-osteal relationship in various forms of osteopathy. He demonstrates that in osteoporotic processes the marrow is not atrophic and hypo-active but rather hyperplastic and hyperactive. In studies on different forms of osteopathy, he shows that the myelogenic factor is of decisive influence in the pathogenesis of these forms of osteopathy. If the functional relationship between the medullary and osteal tissues is impaired, there develops a syndrome which can be designated as myelogenic osteopathy. The author thinks that the syndrome of myelogenic osteopathy represents a proof of Naegeli's hypothesis of the medullary origin of osteomalacia. He further shows that the idea of hematic dysplasia, which Gänsslen formulated for the age of growth, applies in a slightly different form also to adults, except that here there is not a single functional direction from bone marrow to bone but relations between cellular marrow and osteoporosis and between fibrous marrow and osteosclerosis.

Blood Picture During Alarm Reaction.—Dalton and Selye say that it has been shown that acute damaging stimuli (such as exposure to cold, muscular exercise, toxic doses of drugs, hemorrhage and surgical intervention) elicit a group of typical symptoms. The most characteristic among these are enlargement of the adrenal cortex with a decrease in its lipid content, loss of chromaffinity of the adrenal medulla, acute involution of the thymus, the lymph nodes and the spleen, formation of ulcers in the gastrointestinal tract, hemoconcentration, and characteristic changes in the chemical composition of the blood. The fact that, irrespective of the type of damaging agent, the resulting symptoms are always approximately the same, led to the conclusion that they are merely the somatic expression of the response of the organism; that is, a hitherto unrecognized generalized reaction of the body. These considerations, and the fact that the reaction can be elicited only by the first exposure and disappears in subsequent exposures, suggested the name "alarm reaction." Since previous investigations had shown that one of the best indexes of an alarm reaction is the blood count, the authors decided to investigate the hematologic changes of the alarm reaction in experiments on animals. They found that following exposure to an agent such as formaldehyde, which elicits a typical alarm reaction, there is an initial decrease in the total white cell count followed by an increase which is

mainly due to neutrophil leukocytosis. At the same time the red cell count rises because of the accompanying hemoconcentration. This rise may be preceded or interrupted by a transitory decrease during the first hour of the experiment. In the case of an alarm reaction produced by muscular exercise, the changes in the white cell count are similar to those elicited by formaldehyde but the red cell count shows a progressive and prolonged decrease, which has not as yet returned to normal even seventy-two hours after the one hour period of exercise. During the neutrophil leukocytosis, eosinophilia develops in most cases, the eosinophils reaching their lowest level (they almost disappear from the blood) before the neutrophils reach their peak. After this, eosinophilia ensues at a time when the neutrophils are returning to normal. Reticulocytes increase in number during the alarm reaction, this increase being much more obvious after exercise than after treatment with formaldehyde. It appears that the so-called nonspecific leukocytosis, preceded by a decrease and followed by an increase in eosinophils, is a constant feature of the alarm reaction.

Klinische Wochenschrift, Berlin

18: 1077-1108 (Aug. 12) 1939. Partial Index

- Structural Analysis of Coagulation of Blood. C. Wolpers and H. Ruska. p. 1077.
*Behavior of Gastrointestinal Tract in Lead Poisoning: Intestinal Disturbances. H. Otto and F. Kuhlmann.—p. 1081.
Electrolytic Equilibrium of Serum in So-Called Serum Inflammation. E. Poli.—p. 1084.
Alimentary Fluctuations in Leukocytes and Acidity Conditions of Stomach. B. G. Hager.—p. 1087.
Investigations on Albucid (Sulfanilamide Derivative) Contents of Blood and Urine After Administration of Albucid in Gonorrhea and Their Significance for Therapeutic Result. W. Gertler.—p. 1089.
Extraction of Protein Substances from Diphtheria Bacilli. K. Soehring.—p. 1093.
Disturbances of Mitosis in Tissue Cultures Produced by Carcinogenic Hydrocarbons and by Sex Hormones. W. von Moellendorff.—p. 1098.

Gastrointestinal Tract in Lead Poisoning.—Otto and Kuhlmann first discuss the different ways by which lead can enter the human organism, mentioning absorption by the lung, the mouth and the skin. Whether the severity of the gastrointestinal disturbances depends on the mode of intake of the lead has not been determined as yet. The oral changes, although of diagnostic significance, do not greatly trouble the patient, whereas the esophageal symptoms have been known to do this. Lead esophagitis, for instance, causes retrosternal pressure, pyrosis and, in rare cases, regurgitation. Spasmodic contractions and even paralysis of the esophagus have been observed as the result of lead poisoning. Inflammatory changes of the internal wall of the stomach are a frequent symptom of lead intoxication. Moreover, gastritis and ulcers have been known to develop in lead poisoning. Reviewing the intestinal disturbances resulting from lead poisoning, the authors give their attention especially to the localization of the lead colics. They reject the generally accepted opinion that the lead colics are localized exclusively in the colon and show that the small intestine is involved. They point out that the patients often localize the spasmodic pains in the region of the umbilicus and of the hypogastrium and that the intestinal pains fail to subside after complete evacuation of the colon. The roentgenologic observations demonstrate even more clearly that the small intestine is involved. For instance, in patients with lead poisoning who were troubled with continuous and severe colics roentgenoscopy failed to reveal colonic spasms but disclosed segmental constrictions and spasms of the small intestine. Cases of definitely established ileus of the small intestine are further proof of the significance of lesions of the small intestine in lead intoxication. The authors further discuss the different modes of development of the disturbances in the small intestine. They consider (1) the direct irritation of the mucosa and of the muscular layers, (2) the irritation of Meissner's and Auerbach's plexus, (3) the impairment of the vagus and sympathetic, (4) lesions of the brain and spinal cord, (5) vascular crises and (6) increased hepatic elimination of porphyrin into the small intestine. The differential diagnosis of lead colic must consider such conditions as biliary and renal calculi, perityphilitis, pancreatic disorders, embolism of the mesenteric vessels, gastric crises and acute porphyria. In the treatment of colic of the small intestine it is necessary to differentiate between the acute and chronic forms

of lead poisoning. The severe pains of acute colic should be counteracted by opium and atropine preparations. Since vascular spasms are involved, amyl nitrite, sodium nitrite and glyceryl trinitrate are advisable. The treatment of constipation is difficult, because the purgatives may increase the intestinal pains. The authors advise against castor oil and croton oil and prefer purgative teas and salts. In case of chronic lead poisoning, removal of the lead depots by means of iodine preparations is an important factor. To be sure, this mobilization of lead may bring on acute attacks. If this is the case, the iodine therapy should be interrupted. The diet of these patients should consist chiefly of vegetables, fruits and eggs. The quantities of food should be moderate.

Novyy Khirurgicheskii Arkhiv, Dnepropetrovsk

- 44:1-96 (No. 173) 1939. Partial Index
*Ether Oil Injection Method of Treatment of Biliary Lithiasis. M. A. Topchibashev.—p. 11.
Electrocoagulation Treatment of Angioma. D. A. Barkov.—p. 20.
Strumectomy as Cosmetic Operation. A. P. Gridnev.—p. 32.
Endemic Goiter in Northeast Portion of Kubashev and in Northeast Portion of Orenburg Provinces. A. A. Brzhozovskiy.—p. 44.
One Stage Operation for Bilateral Ureteral Stones. S. P. Portugalov. —p. 49.
Gas Phlegmon. A. M. Barbolin and A. I. Shechekoturov.—p. 56.

Ether Oil for Biliary Lithiasis.—According to Topchibashev, a pure cholesterol stone placed in a test tube containing ether became dissolved in one and one-half hour's time. Combined stones required from three to four hours. Of 120 stones experimented with, 7 per cent failed to dissolve. When sectioned, these stones displayed several layers. When the upper crust of such a stone was removed, solution of the rest took place in from three to four hours. It was further established that stones dissolved in ether vapor as well as in fluid ether. Gallstones kept in bile removed from the gallbladder of a dog did not undergo any change. Stones from the same clinical case were placed in the gallbladder of a dog and 1 cc. of ether was administered hypodermically for the next fifteen days. The stone removed at the end of the period showed definite changes and diminution in size. A control experiment showed no alterations in the appearance and size of the stone. Gallstones placed in 5 cc. of blood removed from a patient before ether narcosis showed no alteration, whereas stones of the same origin placed in 5 cc. of blood from the same patient after he had been etherized dissolved completely in the course of a few hours. Between 1933 and 1939 the author treated 150 cases of biliary lithiasis by daily hypodermic or intramuscular injections of an emulsion of 3 cc. of ether and 2 cc. of olive oil. This was continued for from fifteen to thirty days. A favorable result was obtained in 132 (88 per cent) of the cases.

Acta Medica Scandinavica, Stockholm

- 101:105-320 (Aug. 27) 1939. Partial Index
Aneurysm of Cerebral Arteries and Polycystic Kidney. I. Snapper and P. Formijne.—p. 105.
*Eosinophilic Leukemia. S. Thomsen and P. Pluun.—p. 116.
*Osteomalacia of Spinal Column from Deficient Diet or from Disease of Digestive Tract: I. From Deficient Diet. E. Meulengracht.—p. 138.
*Id.: II. Osteomalacia Achylia. E. Meulengracht.—p. 157.
*Id.: III. Osteomalacia and Abuse of Laxatives. E. Meulengracht.—p. 187.
*Cardiovascular Changes in Essential Hypertension, with Special Reference to Electrocardiogram in Hypertension. H. Rasmussen and R. Thingstad.—p. 237.
Histopathologic Investigations in Icterohemorrhagic Spirochetosis and A. J. C. Haxx.—p. 256.
Influence of Urethane on Metabolic Action of Thyroxine and Diutrophinol. N. Alwall and S. Sylvan.—p. 290.
*Basophil Stippling of Erythrocytes in Sulfanilamide Anemia. H. Myhre.—p. 315.

Spinal Osteomalacia from Deficient Diet or Disease.—Meulengracht presents a series of three articles on osteomalacia of the spinal column. In the first one he reports observations on six patients who had lived on a diet which was more or less unbalanced and qualitatively poor or incomplete. In the second one he describes observations on eight patients who

had lived on a somewhat insufficient diet and who in addition to this had gastric achylia. In the group of patients presented in the third report the diet may have been unbalanced, but these patients are of interest especially because their histories revealed the continual use or abuse of laxatives. The osteomalacic changes were located chiefly in the spinal column. The subjective symptoms were pain in the back and loins, sometimes occurring in acute attacks. In the majority of the cases, external examination disclosed collapse of the back and in some this was associated with kyphosis. A considerable reduction in the height of the body was often noted as well. X-ray examinations revealed calcium deficiency of the skeleton, which was most marked in the spinal column. The vertebrae were narrow, biconcavely excavated or more irregularly deformed. In several cases roentgenoscopy disclosed secondary osteoarthrosis of the lumbar spinous processes due to collapse and shortening of the lumbar vertebral column. The author thinks that he is right in regarding osteomalacia as the result of dietetic deficiencies, more especially of an insufficient amount of, or an unsuitable proportion between, the calcium, phosphorus and vitamin D in the food. In this connection he cites several investigators, who pointed out that the diet of the Danish population is deficient in calcium, phosphorus and vitamin D. He believes that osteomalacia is by no means a rare disease and stresses that it must be borne in mind that, as is the case in other diseases due to dietetic deficiencies, in addition to the few manifest cases there is a large number of latent cases. Dietetic deficiencies were considered. Abnormal conditions in the digestive tract, such as gastric achylia or the abuse of laxatives, which impaired the absorptive processes, contributed to or were the chief causes of the malady. Treatment with calcium salts and vitamin D improved or banished the pain and disablement caused by the spual osteomalacia.

Cardiovascular Changes in Essential Hypertension.

Rasmussen and Thingstad examined 100 patients with essential hypertension as regards cardiovascular changes. They investigated the cardiac function, the size of the heart, the electrocardiogram, the breadth of the aorta and the calcareous deposits in the aorta and the tibial arteries. Only 8 per cent of the patients were free from pathologic changes in the cardiovascular system. The degree of cardiac enlargement and of the electrocardiographic changes was found to be independent of the height of the blood pressure. A study of the relationship between important points regarding the pathogenesis of the electrocardiographic changes in hypertension. The authors show that the four distinct types, characterized by various alterations in the QRS complex, the ST segment and the T wave. The types seem to represent different stages of the same evolution. A closer examination of the relation between these four electrocardiographic types and the cardiac enlargement revealed a strong correlation between these types and the size of the heart. Thus types I and II with comparatively small changes in the electrocardiogram corresponded to slight changes in the enlargement of the hearts, while the patients with gross enlargement of the electrocardiogram, type III ("left ventricular preponderance curves") and type IV ("electrocardiogram of the bundle branch block of the common form") had the largest hearts. Consequently the authors believe that the electrocardiographic changes described as characteristic of the electrocardiogram of hypertension are due to varying degrees of left ventricular enlargement (dilatation and/or hypertrophy) and are not due to disease of the coronary arteries. The electrocardiogram of the bundle branch block of the common type (type IV) was observed in seven of 100 hypertensive patients. An analysis of the seven cases together with another group of twenty-one cases with this electrocardiographic picture revealed that all twenty-eight cases with "electrocardiogram of the bundle branch block of the common form" were characterized by gross left ventricular enlargement. The chief cause of "electrocardiogram of the bundle branch block of the common form" (classic terminology: right bundle branch block) is supposed to be severe left ven-

Basophil Stippling of Erythrocytes in Sulfanilamide Anemia.—According to Myhre it is a well known fact that anemia may occur in connection with sulfanilamide treatment. Having observed basophil stippling of the erythrocytes in studying the blood of a woman who developed granulocytopenia after taking 19 Gm. of sulfanilamide, the author decided to examine the blood of patients with slowly developing sulfanilamide anemia for basophil stippling. In the first patient the highest count of stippled cells was 3,200 per million erythrocytes. In the second patient, a girl aged 17, who was given large doses of sulfanilamide in the course of meningitis, after having previously received it in an attack of tonsillitis, the stippled cell count reached the maximum of 6,500 per million erythrocytes. Two other patients who had received sulfanilamide for pyelitis showed a moderate increase in stippled cells (1,000 and 700 per million erythrocytes, respectively). In two other patients, in whom the total dose of sulfanilamide was unknown, the treatment having begun previous to hospitalization, the stippled cells reached a total of 3,000 per million erythrocytes. The author counted the stippled cells by means of Schmidt's method. He says that the phenomenon of stippling is an acknowledged sign of blood regeneration but that he has never seen it in connection with anemias secondary to infections but only in toxic anemias. Lead poisoning, the most common cause of stippling, could be excluded in the reported cases. In these patients, who had received sulfanilamide, the stippling was unusually fine. The stippled cells are not identical with reticulocytes but may appear simultaneously. The author suggests that the rapid increase in stippled cells (6,500) and reticulocytes observed in one of the patients may have been the result of the treatment with liver extract. He never observed stippling after the customary doses of sulfanilamide. Nevertheless, the reported cases show that sulfanilamide may have a profound influence on the hemopoietic system, even if no alarming anemia occurs.

Nordisk Medicin, Helsingfors

3: 2305-2374 (July 29) 1939. Partial Index

Hospitalstidende

- *Treatment of Pneumonia in Adults and Children with Acetyl Sulfapyridine. A. Eldahl.—p. 2309.
- Investigations on Active Spectral Range in Phytogetic Photodermatosis Due to *Pastinaca Sativa* (Oppenheim's *Dermatitis Striata Bullosa Pratisensis*). T. Jensen and K. G. Hansen.—p. 2314.
- Eleven Cases of Incomplete Menstruation. Karen Røjel, née Formann.—p. 2319.

Treatment of Pneumonia with Acetyl Sulfapyridine.—Eldahl says that of the fifty-five patients treated with acetyl sulfapyridine thirty-four were adults and twenty-one were children. *Pneumococcus* types I, III, VI, VII and XIX were found respectively in ten, five, eight, seven and five cases (21, 10.4, 16.4, 14.6 and 10.4 per cent). The average amount given adults was 40 Gm. and children 25 Gm. In twelve patients (22 per cent) the temperature dropped to 38 C. (100.4 F.) during the first twenty-four hours of treatment, in twenty-five (45 per cent) in the course of the second day. Two patients with *pneumococcus* types III and XVIII respectively died in the acute stage, with a resulting mortality rate of 3.6 per cent. The toxic symptoms were vomiting in thirteen cases, hematuria in one; whether the jaundice which occurred in one instance was due to the drug or to an acute infectious hepatitis could not be determined.

Norsk Magasin for Lægevidenskaben

- *Infraclinoidal Aneurysm of Internal Carotid—Ophthalmoplegic Migraine. B. Nyquist, S. B. Refsum and A. Torkildsen.—p. 2325.
- Treatment of Pellagra with Nicotinic Acid: Clinical Review with Report of Case. A. H. Brinchmann.—p. 2335.
- Several Kinds of Block, Interference and Paroxysmal Tachycardia in Same Person. J. H. Vogt.—p. 2337.
- Significance of Material for Degree of Sensitivity of Single Pirquet Reaction with 1 Mg. Tuberculin. G. Hertzberg.—p. 2340.

Infraclinoidal Aneurysm of Internal Carotid—Ophthalmoplegic Migraine.—Nyquist and his associates say that the accepted conception of the syndrome of ophthalmoplegic migraine as due to infraclinoidal aneurysm was expressed by the Norwegian Eduard Bull in 1877. Six cases of infraclinoidal aneurysm associated with typical symptoms are reported. In five the symptoms began with pain corresponding to the first branch of the trigeminal nerve, followed by palsy of the oculomotor

nerve. Exophthalmos was present in all but one case. One case, with bilateral aneurysm, is believed to be the fifth of its kind to be reported. The symptomatology is marked by two phases, (1) the acute episode due to rupture of the aneurysm and (2) symptoms due to pressure of the aneurysm on the neighboring structures. The history is often characteristic of a vascular disorder and suggests the diagnosis. Verification of the diagnosis depends on arteriographic, operative or postmortem establishment of the aneurysm. Treatment consists of ligation of the artery central to the aneurysm, the primary aim being to prevent future ruptures. This possibility is always at hand and the prognosis as far as life is concerned is doubtful.

3: 2375-2460 (Aug. 5) 1939. Partial Index

Hospitalstidende

- Bacteriologically Controlled Experiments to Change Abnormal Intestinal Flora by Administration of *Bacillus Acidophilus* (*Thermobacterium Intestinalis*, Orla-Jensen) in Therapeutic Doses. E. Mejlbø and F. Nygart.—p. 2383.
- *Studies on Certain *Pneumococcus* Antibodies (Agglutinin and Capsular Swelling Antibodies). Emilie Faber.—p. 2391.
- Symptoms and Treatment of Roentgen Climacteric. Johanne Christensen.—p. 2295.
- Autochthonous Sinus Thrombosis as Postoperative Complication. K. E. Petersen.—p. 2398.

***Pneumococcus* Antibodies.**—In her investigations on the *pneumococcus* agglutinins and capsular swelling antibodies of types I to XXXII in serums from 100 healthy persons, Faber found antibodies against one or more types, with titers of from 2 to 16, in 18 per cent. The presence of antibodies of a certain type in the postcritical serum of a pneumonia patient, she says, does not establish this *pneumococcus* type as the etiologic factor in the pneumonia unless antibodies of this type were demonstrated in the blood before the crisis.

3: 2461-2516 (Aug. 12) 1939. Partial Index

Hospitalstidende

- *Hematuria in Treatment with Sulfapyridine. N. I. Nissen and C. R. Roesgaard.—p. 2461.
- Inhibiting Action of Liquid Petrolatum in Utilization of Substances with Active Vitamin A. T. K. With.—p. 2468.

Hematuria from Sulfapyridine.—Nissen and Roesgaard state that on examination of the daily urine of forty-one patients, mostly with various types of pneumonia, all treated with sulfapyridine, hematuria was demonstrated in fifteen: macroscopically in five and microscopically in ten. In two cases the hematuria was accompanied by subjective symptoms of kidney disease (renal colic and anuria respectively). As a rule the hematuria lasted only a day or at the most a few days; there was no lasting symptom of any kidney lesion in the surviving patients. As the urine after a few days intensive treatment with sulfapyridine often changes from a dark brown to a reddish brown, a slight hematuria may easily escape observation unless daily tests of the urine are made. If the indication for continuation of the treatment is not vital, discontinuance of the drug is advised on the slightest sign of hematuria.

3: 2517-2592 (Aug. 19) 1939. Partial Index

Hospitalstidende

- Diagnosis of Gastritis: Comparative Investigation of Gastroscopy and Other Diagnostic Aids. K. Lundbæk.—p. 2517.
- *Studies on Type III *Pneumococcus* Pneumonia. G. Allsted.—p. 2523.

Type III *Pneumococcus* Pneumonia.—Alsted reports thirty cases of type III pneumonia (sixteen of the lobar form, fourteen of bronchopneumonia) treated in Bispebjerg Hospital in the same period with twenty-four cases of type I pneumonia (all lobar) and nineteen of type VII pneumonia (eighteen of lobar form, one of bronchopneumonia). He says that type III apparently predominates in women and in older persons, although the mortality rate is highest among the middle aged. In type I and type VII pneumonia two thirds of the patients were under 40. Type III is regarded as a special clinical and pathologic entity, differing distinctly from types I and VII, which generally have a less dangerous course and may be more easily influenced by specific treatment. The most rational treatment at present for type III pneumonia appears to be an energetic chemotherapy, instituted as early as possible in the course of the disease; specific therapy, however, seems to be without notable effect in bronchopneumonia.

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VASOMOTOR CHANGES IN THE CORONARY ARTERIES AND THEIR POSSIBLE SIGNIFICANCE

CHAIRMAN'S ADDRESS

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Just what might be "the nature and the cause" of angina pectoris has been a subject of interest and of varied opinion from the time of Heberden. Huchard, in the last quarter of the last century, listed some sixty-three various theories as to the cause. This list covered the possibilities so thoroughly that the only addition since that time has been that ascribing the source of pain to the esophagus and stomach—and not to the heart at all. Each theory has won adherents in its time, only to lose them again and then to revivify them in later decades. Each theory has had as its exponents some of the most distinguished physicians of the period. It may be said of angina pectoris in general what W. Townsend Porter said of the experimental work on the coronaries: "Seldom have the results of physiological studies been more at variance. The attentive reader will find no statement that is not denied, no fact not in dispute."

Today little essential difference of opinion remains. Clinicians and physiologists alike agree with Huchard's dictum: "There are not several anginas of the breast; there is only one—coronary angina." He was considering as instances of angina, however, only those cases in which definite anatomic changes in the coronary arteries could be assumed from the history and from physical examination or demonstrated at autopsy. Other cases, even though symptomatically identical, were classed as nervous, toxic or reflex. There still exists, to some extent, this same reluctance to consider as angina pectoris conditions which are apparently free from demonstrable changes in the heart or its vessels. In other than angina, attention has also been fixed on the effects of decrease in flow consequent on structural changes, and little attention has been paid to the possible effects of transient decrease in flow consequent on vasomotor changes.

The symptoms of angina pectoris result when the blood supply to the heart muscle is inadequate for its needs at that moment. In most cases this is due in whole or in part to anatomic changes in the vessels which render them unable to meet the increased demands which accompany increased work of the heart.

However, a similar disproportion between supply and demand would result if the vessels failed to increase in caliber in response to the increased needs, even though they might be adequate anatomically to furnish a sufficient blood supply. This same disproportion would result also in cases in which the needs of the muscle remained constant, increased or even decreased, but in which the blood flow was diminished in consequence of a vasoconstrictor action.

From clinical observation there is reason to assume that in some cases angina may be due to vasomotor factors which are responsible for the lack of equilibrium between supply and demand. One would have to consider a failure of the vasodilator mechanism to respond to increased needs, a failure of relaxation of the vagus tone which Rein¹ has shown to be present or, in some cases, an actual vasoconstriction. Theoretically, one or the other mechanism might be the determining factor in different cases.

Such clinical concepts find some confirmation in experimental work on animals. Porter² and Maass³ demonstrated a vasomotor control of the coronary flow. This work has been confirmed and extended by Anrep,⁴ Greene,⁵ Rein¹ and others. Reflex changes in coronary flow have been demonstrated by these same authors. That such changes in coronary flow may result clinically from factors occurring in daily life is evidenced by the coronary vasoconstriction which Anrep,⁴ Greene⁵ and others have shown to result from an increase of cephalic blood pressure past a certain point. In the cases reported by Lewis⁷ in which anginal attacks occurred after a rise in pressure past a certain point, it seems probable that some such mechanism was present. The effect of gaseous distention or hiatus hernia in provoking attacks has long been a common observation. Von Bergmann⁸ has shown that the inflation of a balloon in the stomach of the dog produced a coronary vasoconstriction abolished by atropine or vagus section. Fenn, LeRoy and I have confirmed this work in the last few months and will report on it later.

1. Rein, Hermann: Die Physiologie der Herz-Kranz-Gefässe, Ztschr. f. Biol. 92: 100-114 (Nov. 30) 1931.

2. Porter, W. T.: The Vasomotor Nerves of the Heart, Boston M. and S. J. 134: 39-40, 1896.

3. Maass, Paul: Experimentelle Untersuchungen über die Innervation der Kranzgefässe des Säugthierherzens, Arch. f. d. ges. Physiol. (Pflüger's) 74: 281-306, 1899.

4. Anrep, G. V.: Lane Medical Lectures: Studies in Cardiovascular Regulation, Stanford University, Calif., Stanford University Press, 1936.

5. Greene, Charles W.: The Nervous Control of the Coronary Circulation and Its Clinical Significance, South. M. J. 29: 478-483 (May) 1936.

6. Greene, Charles W.: An Analysis of the Relations of the Coronary Constrictor and Dilator Nerves in the Cervical Vagosympathetic of the Dog, Am. Heart J. 11: 592 (May) 1936.

7. Lewis, Thomas: Material Relating to Coarctation of the Aorta of the Adult Type, Heart 16: 205-261 (June 14) 1933.

8. von Bergmann, G.: Das "epiphrenale Syndrom," seine Beziehung zur Angina pectoris und zum Kardiospasmus, Deutsche med. Wchnschr. 58: 605-609 (April 15) 1932.

Hall⁹ and de Takats and Fenn¹⁰ have recently reported on reflex vasomotor changes in the coronary arteries following coronary occlusion and following pulmonary emboli.

It seems probable also that there is such a thing as toxic vasoconstriction, as Huchard predicated, resulting either from a direct effect on the vasomotor mechanism or reflexly from other visceral effects of the agent. That some drugs have a vasoconstrictor effect is known, and considerable evidence is accumulating against tobacco.

The assumption of vasomotor changes in the caliber of the coronary arteries is not new, dating well back into the last century. Such reflex vasomotor response or lack of response is not a normal physiologic process and is not to the advantage of the organism. In that respect it is not unique, sharing a place with esophageal or gastric neuromuscular disturbances, spastic colon, bronchial asthma and allied symptomatic disorders. It is necessary to predicate some alteration in the normal physiologic background which renders nerves and tissues more amenable to subversive propaganda. Deviations from the physiologic normal involving hyperactivity or hypoactivity of the autonomic nervous system are matters of daily observation in clinical practice. They are the basis of many of the disorders on which the physician is called to give advice.

If one assumes that the lack of equilibrium between the needs of the heart muscle and the blood supply can result from vasomotor changes or from lack of such changes, as well as from anatomic changes, one will explain a great many of the observations regarding not only angina pectoris but degenerative changes in the heart muscle which it is difficult to explain on a purely structural basis.

It is recognized, for example, that angina pectoris frequently occurs in patients of whom there is no clinical reason to suspect pathologic changes in the heart or its vessels and in whom there is no clinical or laboratory evidence of such changes. At autopsy such persons frequently show only such alterations as would be expected at the age at which they die. It must always be borne in mind that most persons will have very definite coronary changes by the age of 45, as shown by Brooks.¹¹ Also, as Allbutt puts it, "few elderly persons die without as much coronary disease as would content a coronarian disputant," and yet only a portion will have had angina.

The assumption of a vasomotor factor would also explain why angina seems to be more frequent in a group of persons who appear to be more highly organized or less stable nervously or who have what Houston¹² referred to as the "spasmogenic aptitude." In such a group, autonomic imbalance is frequently expressed in many ways.

In this connection the observations of Gregg¹³ are of interest. In a study of a psychotic group as compared with the normal population, he found coronary disease one-fourteenth as frequent and ulcer of the stomach one-third as frequent in the psychotic group. He stated the belief that this is because in the normal

person there is a more prolonged physiologic response to autonomic stimuli, while in the more primitive pattern of the psychotic person such reactions are brief and the organism is relatively immune to the results of emotional stress and fatigue. It is possible also that emotional phenomena express themselves in behavioristic activity rather than in a physiologic equivalent.

The assumption of such vasomotor phenomena would also explain the frequent occurrence of angina pectoris in patients working tensely, under conditions of stress and strain, with inadequate rest and relaxation. There is reason to think that fatigue and emotional stress also tend to produce an autonomic imbalance, just as during the World War the aviators showed evidence of an overlabile autonomic system as the result of staleness. This condition would be relieved by a period in the rest camp.

It would also explain why the patient who suffers daily attacks of angina of effort under the strain of his daily work is able to undergo much more physical effort without attacks while he is away on vacation. On his return to what Dr. Bucknill, in his reply to Thomas Arnold, referred to as the "anxiety and eager competition" of his business life, he experiences the return of the attacks. Certainly the anatomic condition of the coronary arteries does not change back and forth between city and country.

It would explain also the occurrence of anginal pain in the so-called effort syndrome, or neurocirculatory asthenia. Whatever the group with this condition may or may not be, it is a group of younger persons characterized by an overlabile autonomic system, responding to smaller stimuli than normal and over-responding to such stimuli. This condition frequently follows as the result of fatigue or of physical or psychic trauma. It may follow such trauma in normal persons, if the trauma is severe enough or exerted over a long enough period. It will result more readily in the group which Campbell¹⁴ classified as "constitutionally inferior."

It is my own impression also that such an assumption of a vasomotor factor might explain in part the age incidence of angina. Several years ago I attempted to show that the autonomic response as measured by digital pressure on the carotid sinus increased with age up to the middle or late fifties and then showed a decrease, with a curve approximating the morbidity curve of angina pectoris.¹⁵

Quite apart from angina pectoris, however, I think that one should bear in mind the possible results of such frequently repeated vasomotor changes on the structure of the cardiac muscle and their part in heart failure.

Hall, Ettinger, Banting and Manning¹⁶ have shown the anatomic changes produced in the heart muscle of the dog by a prolonged or repeated vagus stimulation. Blumgart and his co-workers¹⁷ have shown that temporary arrest of the blood flow in a single coronary artery leads to anoxic electrocardiographic changes

9. Hall, G. E.: Arch. Int. Med., to be published.
10. de Takats, Geza, and Fenn, G. K.: The Mechanism of Death in Pulmonary Embolism. Arch. Int. Med., to be published.
11. Brooks, Harlow: A Preliminary Study of the Visceral Arteriosclerosis, Am. J. M. Sc. 131: 778-786, 1906.
12. Houston, William R.: The Art of Treatment, New York, Macmillan Company, 1936.

13. Gregg, D. C.: The Relative Immunity of Psychotic Cases to and Other Diseases, Tr. Am. Neurol. A., 1938, pp. 121-126.

14. Campbell, C. Macfie: The Role of Instinct, Emotion and Personality in Disorders of the Heart, J. A. M. A. 71: 1621-1626 (Nov. 16) 1918.

15. Gilbert, N. C.: The Increase of Certain Vagal Effects with Increased Age, Arch. Int. Med. 31: 423-432 (March) 1923.

16. Hall, G. E.; Ettinger, E. H., and Banting, F. G.: An Experimental Production of Coronary Thrombosis and Myocardial Failure, Canad. M. A. J. 34: 9-15 (Jan.) 1936. Manning, G. W.; Hall, G. E., and Banting, F. G.: Vagus Stimulation and the Production of Myocardial Damage, ibid. 37: 314-318 (Oct.) 1937. Ettinger, E. H.; Hall, G. E., and Banting, F. G.: Effect of Repeated and Prolonged Stimulation of the Vagus Nerve in the Dog, ibid. 35: 27-31 (July) 1936.
17. Blumgart, Hermann L.; Hoff, Hebel; Landowne, Milton, et al.: Schlesinger, Monroe J.: Experimental Studies on the Effect of Temporary Occlusion of Coronary Arteries, Tr. A. Am. Physicians 47: 210-217, 1937.

in one minute. Arrest of flow for from twenty-five to forty-five minutes resulted in areas of necrosis.

As I have said previously, the assumption of such vasomotor influences on the coronary flow is by no means new and is a clinical concept accepted in whole or in part by a large number of clinicians today. In attempting to emphasize its importance, I do not wish to appear to minimize at all the importance of anatomic changes. The physiologic factors are frequently superimposed on such anatomic changes. Nor do I wish to minimize the importance of the many other factors of which the volume of coronary flow is the resultant. Among these are included the observations of Dr. Kerr,¹⁸ confirmed as they are by his therapeutic results, and the work of Kountz¹⁹ and others.

Such vasomotor phenomena constitute only one factor in many. The primary importance of such physiologic factors lies in the place which they hold in therapy and in future lines of investigation. Dr. J. B. Murphy used to say: "Listen to the patient's story. He is telling you the diagnosis." And, one might also add, the patient is giving you hints as to treatment. The necessity of avoiding any stimuli which might tend to produce any vasomotor changes in the coronary blood supply is obvious. There is also the possibility of avoiding or minimizing such stimuli by therapy directed toward that end. Because of the nervous background in so many cases, what Kipling once referred to as "the therapeutic value of words" is often quite as important as any one form of therapy.

Because a patient has typical anginal pain does not always mean that conditions are present in the heart which absolutely preclude any possibility of an adequate coronary flow. Changes in the coronary arteries are undoubtedly present in the usual case of angina pectoris, just as such changes are present also in any normal person of a similar age. In many cases the anatomic changes in the coronary arteries are the largest single factor, or even the one single factor, responsible for the symptoms. In a great many others, such arterial changes are only one of many anatomic and physiologic factors. Just what these other factors are must be sought for in the patient's history and in the physical and laboratory examinations.

Treatment must depend on an evaluation of just what conditions are valent in producing a disproportion between cardiac needs and cardiac blood supply. In spite of all that has been said and written, a great deal still remains to be learned with regard to the physiologic background of anginal pain and with regard to therapeutic means to offset or combat whatever conditions may be responsible for angina pectoris.

104 South Michigan Avenue.

18. Kerr, W. J.: *Tr. A. Am. Physicians*, to be published.

19. Kountz, W. B.: *The Coronary Flow in Dilated Human Hearts*, *Proc. Am. Soc. Clin. Investigation* 15: 453, 1936.

Ideal Weight.—The amount of fat which an individual should normally carry can only be stated vaguely. The ideal quantity is undoubtedly that which allows the maximum of physical enjoyment and mental happiness. Every one should be acquainted with the weight which is best for himself, remembering the figure in stones and pounds just as readily as he remembers his size in hats, gloves, shoes and stockings. For most people the best weight is that which they held in the twenties, but as age advances many leave it gradually behind; most people look back to those years as the fittest of their existence.—Christie, W. F.: *Ideal Weight: A Practical Handbook for Patients*, London, William Heinemann, 1938.

POLYPS OF THE COLON AND RECTUM AND THEIR RELATION TO MALIGNANCY

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AND

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During the past ten years the treatment of carcinoma of the colon and rectum has been vastly improved. At this clinic the resectability of lesions of this type has risen from 50 per cent in 1928 to 89.9 per cent for the year 1938. In the same period the operative mortality has also been greatly reduced. A mortality of 36 per cent in 1928 has been lowered to 10 per cent in 1938. These figures are but an index of what has occurred generally when there has been an especial interest in this subject. The improvements have been due largely to the better preparation of these patients for operation, improved anesthesia, increased experience in the actual removal of these lesions and better post-operative care. The end results following the removal of malignant lesions of the colon and rectum are among the most satisfactory of any group of patients with malignant disease. In this clinic at the present time 42 per cent of the patients who have undergone radical resection for carcinoma of the colon and 47 per cent of those who have undergone radical operation for carcinoma of the rectum are alive and well, without evidence of recurrence, five years after operation. However, last year, in reviewing a series of 300 patients with carcinoma of the colon and rectum, we were a little discouraged to find that the average duration of symptoms at the time of resection was nine months. This was the same duration that was revealed by a similar study five years previously. We believe that the early diagnosis of malignant disease in the large bowel has not been sufficiently emphasized and that there is a need for further study and discussion of the development and early stages of carcinoma of the colon and rectum.

It is our purpose in this paper to review a series of 156 patients with benign and malignant polyps of the colon and rectum who have been operated on at this clinic during the past eight years. By this study we hope to bring about a more widespread understanding of the development of malignant disease in this region and emphasize factors that will bring these patients to operation earlier than in the past.

In this analysis of polypoid disease of the large bowel the premalignant nature of polyps of the colon and rectum will become evident. The etiology of this disease will be briefly discussed. The transition of benign polyps into carcinoma will be reviewed from a clinical and histologic standpoint. Criteria will be discussed for the diagnosis of malignancy in polypoid disease of the large bowel. The plan of management in both the study and the treatment of these patients as employed in this clinic will be presented.

The term polyp has been defined as a tumor arising from mucous membrane and attached to that mucous membrane by a pedicle. In this study the term polyp will include not only those pedunculated tumors arising

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from the wall of the large bowel but also those sessile tumors arising from mucous membrane which have no demonstrable pedicle. We refer to these polyps as mucosal polyps; the majority are true adenomatous polyps, although in a few fibromatous and papillomatous characteristics may predominate. Thrombosed internal hemorrhoids, hypertrophied anal papillae and other

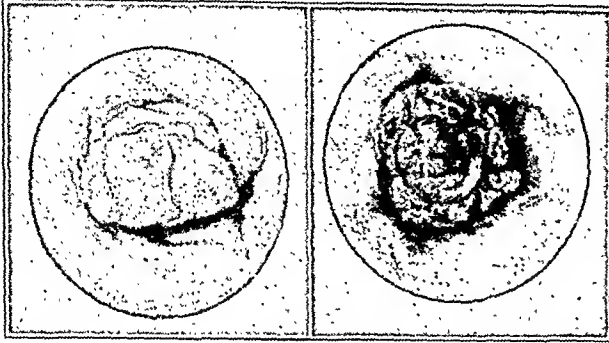


Fig. 1.—Benign mucosal polyps of the rectum seen through the sigmoidoscope.

fibrous tumors arising distal to the true rectal mucosal segment have been erroneously referred to as rectal polyps. We have never seen malignant disease develop in tumors of this type, and such polyps are not included in this study.

Polyps of the colon and rectum may be single or multiple and may be found in any portion of the large bowel. They may involve the entire colon and rectum. Clinically, we classify mucosal polyps as benign or malignant, single or multiple, and refer to cases of multiple polyps as multiple polyposis. Buie¹ has pointed out that this use of the term multiple polyposis is fundamentally incorrect; nevertheless it has been



Fig. 2.—Benign polyp in sigmoid demonstrated by contrast air enema technic.

generally accepted. The cases of polypoid disease of the entire colon and rectum, demonstrated by McKenney² to be congenital in character, we refer to as congenital multiple polyposis of the colon and rectum.

1. Buie, L. A.: *Practical Proctology*, Philadelphia, W. B. Saunders Company, 1937.
2. McKenney, D. C.: *Multiple Polyposis of Colon: Familial Factor and Malignant Tendency*, *J. A. M. A.* 107: 1871-1876 (Dec. 5) 1936.

Histologically, the structure of polyps varies markedly. A fairly typical polyp may be described as an epithelium covered stalk of connective tissue, moderately vascularized and usually provided with a muscularis mucosae continuous with that of the intestinal wall, and it may contain scattered smooth muscle fibers in its deeper substance. This stalk may be single and fairly straight or it may be frondlike. Multiple closely adjacent stalks may make up a single sessile polyp. The covering epithelium ranges from the normal mucosa of the large intestine to irregular glands, variable in size and shape and lined with tall columnar epithelium with large, vesicular nuclei and prominent nucleoli frequently containing mitotic figures. Many times the normal mucosa is absent or is present only along the base of the stalk. The amount of mucous secretion varies greatly; goblet cells may be numerous. Masses of mucus may occur on the surface of the polyp and may penetrate into its stroma. Occasionally no mucous secretion is apparent.



Fig. 3.—Malignant adenoma of transverse colon.

In the sessile type of polyp with broad base there may be multiple small prolongations of the submucosa of the intestine with any of the aforementioned types of mucosa covering them. In these the strands of connective tissue are never so long as in the more common type and the amount of muscularis mucosae varies greatly, sometimes being entirely absent. In all polyps the mucosa is of fairly even thickness and usually shows well defined boundaries from the stroma.

In either type of polyp there is usually no evidence of inflammatory reaction other than a slight lymphocytic infiltration at the base. Rarely focal ulceration or necrosis may be present, usually at the tip. Owing to the marked vascularity, small hemorrhages may occur and hemosiderin-laden macrophages appear in the stroma as evidence of past trauma. The mucosa of the polyp always merges smoothly with that of the adjacent normal intestinal wall and frequently it will be noted the normal mucosa continues well out along the stalk.

It is possible in our series to demonstrate histologically all stages in the sequence of change from normal colonic mucosa to actual adenocarcinoma.

The etiology of polyps of the colon and rectum has not been accurately established. McKenney has made a careful study of a group of patients with polyps, one of whom was an infant aged 2 years. He obtained convincing evidence of the congenital nature of the cases of multiple polyposis of the entire colon. Erdmann and Morris³ classified all cases as either congenital or acquired. The reported frequent observation of the development of multiple polypoid-like structures in cases of ulcerative colitis suggests the "acquired" nature of some of these tumors. From a microscopic study of a large series of intestines from patients with chronic ulcerative colitis, both specimens removed surgically at varying lengths of time after onset of the disease and specimens obtained at autopsy, we believe that chronic ulcerative colitis is not a factor predisposing to the development of polyps. While the very extensive ulcerations may at times fuse and leave elevated strips of mucosa, or may actually undermine strips of mucosa communicating with one another so that bridges or free tags of mucosa may be left, examination of these bridges or tags which may simulate polyps shows a definitely different type of structure. The mucosa is

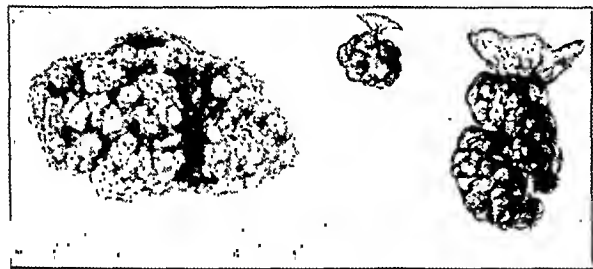


Fig. 4.—Large benign mucosal polyps successfully removed from sigmoid by colotomy.

never normal, nor is there the usual hyperplastic change seen in polyps. Instead, there are atrophy of the mucosa and varying amounts of chronic inflammatory reaction, often with fibrosis—a marked contradistinction to the neoplastic type of polyp.

In our patients with ulcerative colitis we have observed another interesting fact. Following healing of the acute ulcerative process, we have known these pseudopolypoid tumors to regress and disappear. After ileostomy and total colectomy in multiple stages in patients with severe ulcerative colitis in which tumors of this type have developed, examination of the removed sections of colon and rectum has frequently revealed the complete disappearance of these mucosal irregularities. We have never observed the regression or disappearance of true polyps of the large bowel except in rare instances in which the polyp has broken away from its pedicle. This, of course, also definitely suggests that the pseudopolypoid tumors resulting from known irritation and infection have different fundamental growth characteristics than the discrete and multiple polyps which are not the result of known infectious processes. It must be recognized that, in cases of extensive polypoid disease of the large bowel, bleeding and discharges will frequently be observed. The marked

3. Erdmann, J. F., and Morris, J. H.: Polyposis of the Colon, Surg., Gynec. & Obst. 40: 460-468 (April) 1925.

increase in epithelial surface and the increased activity of the mucosa of the polyp account for the increased mucus in the stool. The numerous thin-walled vessels in the stalk are easily traumatized and are the source of frequent small hemorrhages. The differentiation between ulcerative colitis in which polypoid changes

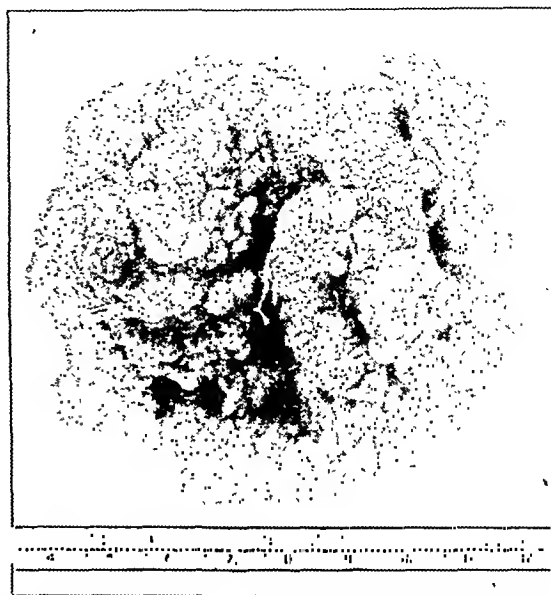


Fig. 5.—Malignant adenoma originating from mucosal polyp removed by modified Mikulicz resection.

have taken place in the mucous membrane and multiple polyposis associated with blood and increased amounts of mucus in the stool must be recognized. We have never observed the polypoid changes seen in ulcerative colitis progress to a malignant stage.

Because of these facts and because of the well demonstrated congenital nature of the cases of multiple polyposis of the entire large bowel, we believe that the majority of polyps of the large bowel are true tumors and are the result of some inherent defect in cellular growth.

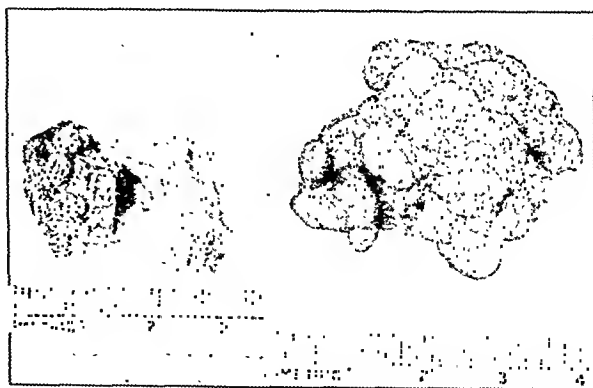


Fig. 6.—Adenocarcinoma of the colon arising in benign mucosal polyps removed by modified Mikulicz resection.

There is no way in our series of cases of polypoid disease to determine the true incidence of colonic and rectal polyps. Buie has reported that about one in thirty-five patients on whom proctoscopy was performed for colonic and rectal disorders had polyps. Lawrence,⁴

4. Lawrence, J. C.: Gastrointestinal Polypos, Am. J. Surg. 31: 499-505 (March) 1936.

reporting a series of 7,000 autopsies from the Cook County Hospital, found an incidence of polyps in the colon of 2.37 per cent and in the rectum of only 0.42 per cent. Lawrence quotes Susman as finding an incidence of polyps in the colon of 6 per cent in a series



Fig. 7.—Section of benign mucosal polyp of pedunculated type. Note normal mucosa on one side of stalk and abnormal mucosa on other; reduced from a photomicrograph with a magnification of 8 diameters.

of 1,100 autopsies. This low incidence of polypoid disease in the rectum as compared with that in the colon does not agree with our experience, as our figures

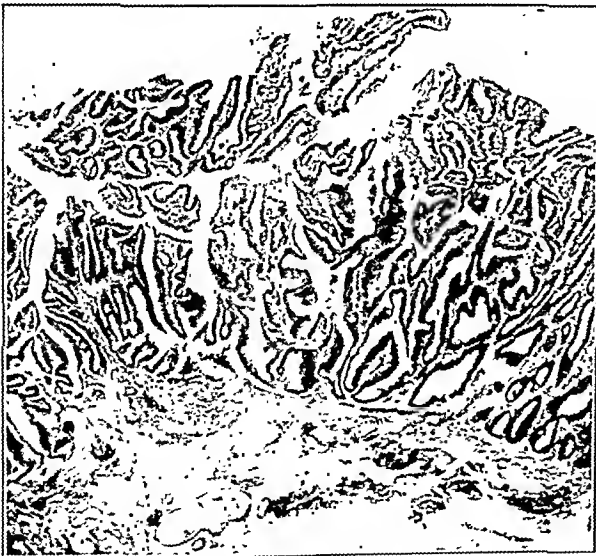


Fig. 8.—Mucosal polyp of sessile type. Note multiple prolongations of the submucosa of the intestine.

will demonstrate. As our interest in polypoid disease of the colon and rectum has increased and our indications for proctoscopic and roentgenographic examinations have widened, we have found more and more polyps in this region, and we believe that the incidence of polyps of the rectum and colon is much greater than has been recognized.

The location of the polyps found in this series of patients is identical with the generally recognized distribution of carcinoma in the colon and rectum. Seventy per cent of the polyps in this series were visualized through the 10 inch sigmoidoscope. In this study we have included only those cases in which histologic sections were made of the removed polyps. There have been an additional number of instances of polyps that were small and were destroyed by fulguration in which no sections were taken for microscopic examination. Actually the incidence of polypoid disease in our series that could be demonstrated on sigmoidoscopic examination was above 70 per cent.

In thirty-five cases in this series the polyps were benign. Single polyps were found in thirty-one and multiple polyps in four. Malignant polyps were encountered in 121 cases. A malignant adenoma alone was found in seventy-two cases and multiple malignant adenomas were noted in four other cases. The malignant adenomas were associated with either single or multiple benign polyps in forty-two additional cases. Three cases presented the congenital type of multiple polyposis, in two of which malignancy was present at the time of resection.

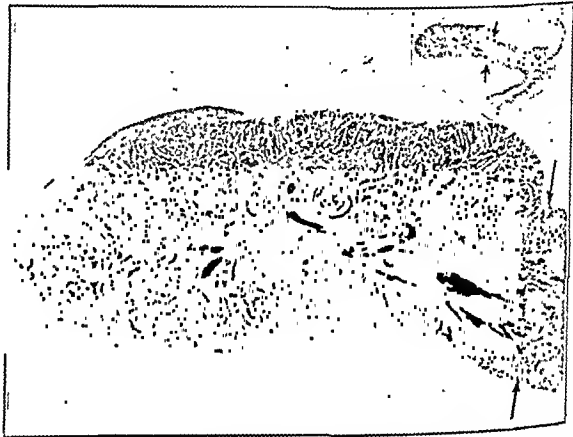


Fig. 9.—Adenocarcinoma arising in the tip of a benign mucosal polyp. Insert shows cross section of the entire polyp with its base and adjacent intestinal mucosa.

This high incidence of multiple polypoid lesions, both benign and malignant, must be recognized and emphasized. In this series of 156 patients the polypoid lesions were multiple in 35 per cent.

Polypoid disease may be found at any age. The patients with benign polyps in our series varied in age from 7 to 80 years. The average age was 53. In the malignant group the average was 57.7 years. The youngest patient with a malignant adenoma was 13 years of age and the oldest was a man of 76. We do not see a large number of children in this clinic and we do not believe that we have a representative age group to determine accurately the age incidence of polypoid disease in younger persons.

The proportion of males and females with either benign or malignant polyps was equal.

Unfortunately, polyps do not give rise to symptoms early in their development. Bleeding was associated with one half of the benign polyps in our series, and in the majority of these cases it would be difficult to determine whether the bleeding came from the polyps or from associated anal disease. Brust⁵ stated that in

5. Brust, J. C. M.: Solitary Adenomas of the Rectum and Lower Portion of the Sigmoid, Proc. Staff Meet., Mayo Clin. 9: 625-631 (Oct. 17) 1934.

his series the symptoms were referable to the polyp in only 20 per cent of the cases. In our series 76 per cent of the polyps were less than 1 cm. in diameter. It is inconceivable that small, discrete polyps of the large bowel frequently give rise to symptoms. As

orders of any type. Particularly is this important with patients giving a history of any abnormality of their stools or alteration in their normal bowel function. The fact that 70 per cent of all polypoid disease in the colon and rectum and 68 per cent of all malignant lesions in this region can be visualized with the 10 inch sigmoidoscope makes this type of examination in these patients imperative.

Roentgenographic studies of the colon should be carried out when the source of rectal bleeding is not obvious from sigmoidoscopic examination and likewise when nonobstructing lesions of any type are seen in the rectum or rectosigmoid regions, in order to determine the multiplicity of these lesions. Studies after administration of a barium enema must always be carried out when there is a history of altered bowel function or unexplained abdominal pain or when an unexplained abdominal mass can be palpated.

In the roentgenographic study of the colon for benign polyps and early malignant lesions, preparation of the colon is essential. At this clinic we give these patients 1 ounce (30 cc.) of castor oil the night before roentgenograms are taken and cleansing enemas the morning of such examinations. It is also necessary in localizing small organic lesions in the colon to employ the contrast air technic in addition to the usual barium enema studies.

When a polyp of the rectum or colon has been visualized, its benign or malignant nature must be established. One of the most important facts that we have learned from our experience with this group of tumors has

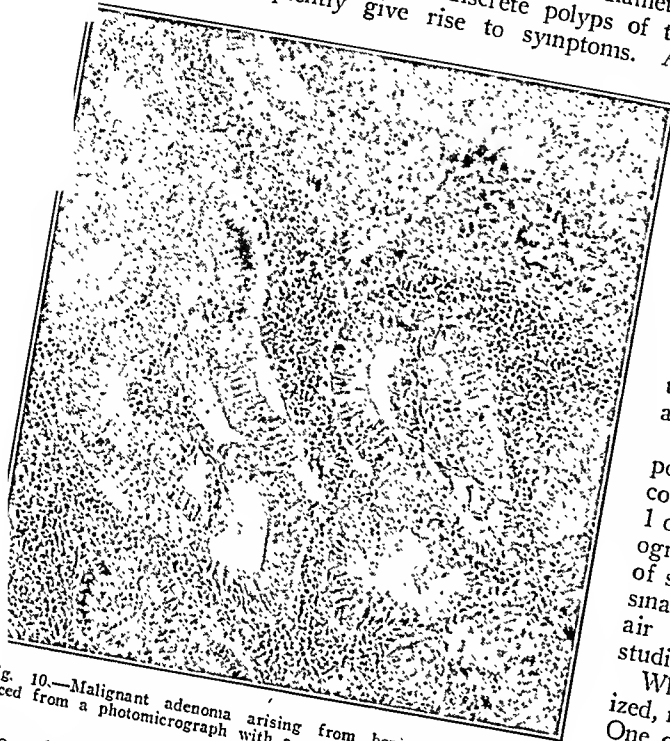


Fig. 10.—Malignant adenoma arising from benign mucosal polyp; reduced from a photomicrograph with a magnification of 250 diameters.

these polyps become larger, however, the incidence of bleeding, mucus and, in rare instances, obstructive symptoms will be more frequent. Likewise the more extensive the involvement of the colon and rectum with polypoid disease, the greater the glandular development and the higher the incidence of bleeding and mucous discharges. The three patients with congenital multiple polyposis included in this group were 19, 33 and 39 years of age; in two of these, malignant degen-

Symptoms of Carcinoma of the Colon and Rectum (300 Cases)

	Rectum, per Cent	Left Colon, per Cent	Right Colon, per Cent	Total, per Cent
Blood in stool.....	86	46	9	46
Altered bowel function.....	79	82	81	80
Abdominal cramps or pain.....	7	77	87	57
None.....	2	2	3	2.3

eration had taken place at the time of operation. These patients all presented symptoms of bleeding, discharge, abdominal cramps and pain, and two had severe anemia.

A review of the malignant polyps in this series shows that the symptomatology does not differ from that of the other types of malignant disease found in the large bowel. In the accompanying table are shown the symptoms presented by a group of 100 patients with carcinoma of the rectum, 100 with carcinoma of the left colon and 100 with carcinoma of the right colon, taken at random from our files. The importance of rectal bleeding, altered bowel function and the presence of unexplained abdominal pain in the early diagnosis of malignant disease can be seen from this table.

At this clinic it is our policy to do sigmoidoscopic examinations on all patients with rectal and colon dis-

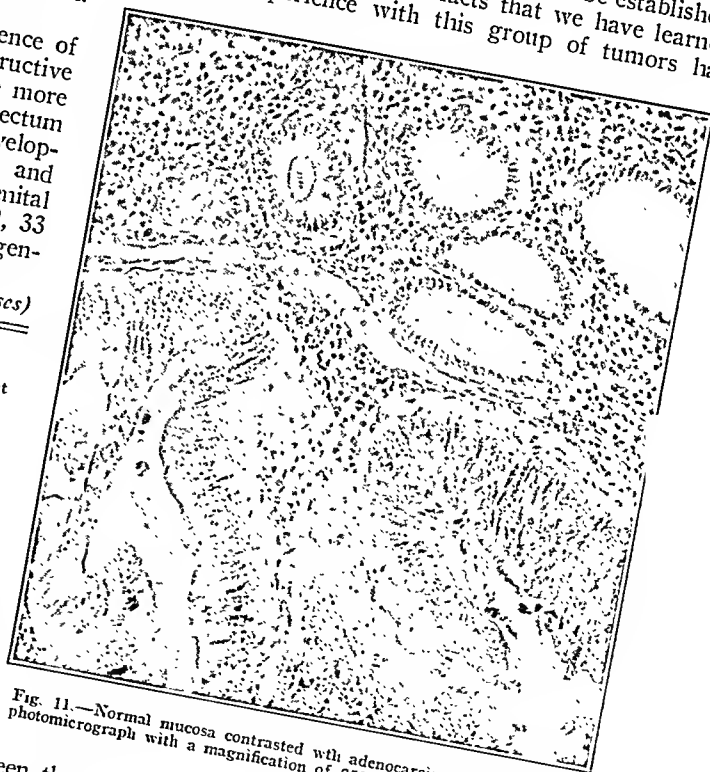


Fig. 11.—Normal mucosa contrasted with adenocarcinoma; reduced from a photomicrograph with a magnification of 250 diameters.

been that the preoperative diagnosis of malignancy in polypoid disease of the colon and rectum will not always be accurate if too much dependence is placed on the pathologist's report of the biopsy specimen. Microscopically, it is relatively difficult to determine the presence or absence of malignant change in intestinal polyps. While the fully developed carcinoma is easily

recognized by the anaplastic character of the cells, the irregularity of the glandular structure and the invasion of not only the immediate stroma but also the adjacent intestinal wall, there are many early or transitional forms that are difficult to classify. If one accepts three important criteria of malignancy—anaplasia, irregularity of architecture, and invasion—it is necessary to have at least two of these three factors present before making a diagnosis of malignant growth. It is possible for any one of these three criteria to be present without an actual malignant condition, with one exception: Definite lymphatic or intravascular invasion nearly always means a clinical malignant condition.

It is important, in attempting a histologic diagnosis, to recognize that different portions of the polyp may present entirely different histologic pictures. Therefore we feel that it is important to make a sufficient number of representative sections and to include an adequate representation of the base. It is particularly important to determine whether or not the base is

or malignant nature. Ulceration, nodular irregularities and a broad pedicle and base suggest malignant change. Firmness, induration and fixation to palpation are pathognomonic of malignant disease. Although it is probably true that a malignant condition is rare in polyps less than 1 cm. in diameter, during the past two years we have encountered malignant change four times in polyps smaller than a walnut. The size of a polyp is not an accurate index of its benign or malignant character.

In the last eight years we have operated on 82 patients with malignant tumors of the colon and rectum. In 32 per cent of this series the lesions were in the colon, and in 68 per cent the malignant condition was found in the rectum and rectosigmoid region of the colon. In 120 cases, or 14 per cent of this entire series, the lesions were true malignant adenomas. We believe that we can say from our study of this series of cases that 14 per cent of the malignant tumors of the colon and rectum can histologically be demonstrated to have

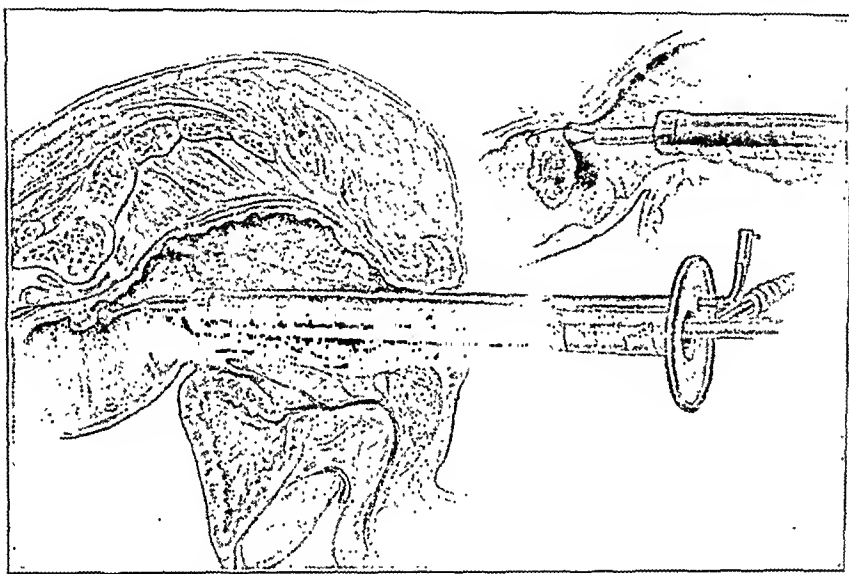


Fig. 12.—Method of fulguration of broad, sessile polyp and removal of pedunculated polyps with high frequency electric snare. The Buie type sigmoidoscope with built in suction is very useful for this work.

arisen in benign mucosal polyps. In the remaining cases of carcinoma of the colon and rectum the invading tumor was so extensive that the original architecture of the tumor could not be identified, but we believe that a much larger percentage of carcinoma of the colon and rectum arises from preexisting benign mucosal polyps. Fitzgibbon and Rankin,⁷ following the classification of Schmieden and Westhues,⁸ believe that certain polyps never undergo malignant degeneration. Although polyps that are entirely covered with normal mucous membrane may not become malignant, clinically we believe that this is a dangerous doctrine to follow. The facts that in 14 per cent of all our cases of carcinoma of the colon and rectum the malignant condition can be demonstrated to have arisen from mucosal polyps, that in our series it has been possible histologically

to demonstrate all stages in the sequence of change from normal mucosa to adenocarcinoma and that the distribution of polypoid disease in the colon and rectum parallels the distribution of malignant growths in this region are sufficient evidence to justify consideration of all polyps of the colon and rectum as pre-malignant lesions.

We believe that malignant change may begin anywhere in a polyp. Saint⁶ has pointed out that the youngest glands will always be found near the periphery of a polyp and that early malignant change in a polyp will be found near its tip. This cannot be depended on in determining malignancy in polypoid disease. In a patient recently examined, we removed fourteen sections of tissue from a large polyp before finding a region of malignant growth in the polyp near its base. The entire polyp together with its base must be examined microscopically for an accurate diagnosis of malignancy. However, in a few of the broad based polyps complete removal may not be feasible. In tumors of this type biopsy specimens should be taken from the firmest areas near the base of the polyp.

The visualization and palpation of polypoid structures are of the utmost importance in establishing their benign

7. Fitzgibbon, Grattan, and Rankin, F. W.: Polyps of the Large Intestine, *Surg., Gynec. & Obst.* 52: 1136-1150 (June) 1931.
8. Schmieden, V., and Westhues, H.: Zur Klinik und Pathologie der Dickdarmpolypen und deren klinische und pathologisch-anatomischen Beziehungen zum Dickdarmkarzinom, *Deutsche Ztschr. f. Chir.* 202: 1-124, 1927.

6. Saint, J. H.: Polypi of the Intestine with Special Reference to the Adenomata, *Brit. J. Surg.* 15: 99-119 (July) 1927.

polyp has been removed at frequent intervals for a period of months to be certain that the tumor does not recur. In polyps above the reflection of the peritoneum and in the rectosigmoid region of the colon, considerable care must be exercised to avoid perforation of the bowel. Troublesome hemorrhage may at times be encountered. We have never had to proceed with resection to control hemorrhage following fulguration, but particularly in polyps that lie at a high level this possibility must be borne in mind. The removal of large polyps and all polyps that arise above the peritoneal reflection should be carried out in a hospital where all facilities are available.

CONCLUSIONS

From this review of 156 patients with polypoid disease of the colon and rectum the following conclusions may be drawn:

1. Polyps in this region are not the result of diffuse inflammatory processes but are true tumors.
2. The incidence of polypoid disease in the colon and rectum is not known, but we believe that it is much more common than has been recognized.
3. Seventy per cent of the polyps in our series could be visualized through the 10 inch sigmoidoscope, but they may be found anywhere in the colon or rectum. This distribution is the same as that of malignant growths found in this region.
4. Thirty-five per cent of the patients in this series had multiple polyps.
5. Polyps may occur at any age and have an even distribution in the sexes.
6. Symptoms due to early benign polyps are rare. Symptoms due to malignant polyps are primarily an alteration in the stool, the presence of blood or mucus, an alteration in bowel function and abdominal pain.
7. The detection of polyps of the colon and rectum depends on sigmoidoscopic and roentgenographic studies. The importance of the preparation of patients for these examinations and the use of the contrast air enema must be appreciated.
8. Histologically, in this series all stages in the sequence of change from normal mucosa to adenocarcinoma can be demonstrated.
9. In the determination of malignancy in polypoid disease the importance of the inspection and palpation of these tumors is emphasized. Histologically, the diagnosis of malignant change depends on the study of the entire polyp together with its base.
10. In our series of 827 patients with carcinoma of the colon and rectum, 14 per cent can histologically be demonstrated to have arisen in benign mucosal polyps. We believe that a high percentage of malignant change in the colon and rectum arises in previously benign polypoid tumors.
11. From the data presented in this analysis we believe that polyps of the colon and rectum are true tumors which are premalignant lesions; that polyps in this area are much more common than has been appreciated and that if all physicians called on to treat disorders of any type of the colon or rectum will submit these patients to sigmoidoscopic and roentgenographic studies an increasing number of polyps will be found, the incidence of carcinoma of the colon and rectum will be reduced and patients with malignant lesions will be submitted to operation earlier than has been the case in the past.

THE ADVANTAGE OF PERINEAL OVER ABDOMINAL COLOSTOMY

WITH TECHNIC FOR TRANSFERRING THE ABDOMINAL OPENING TO THE PERINEUM

W. WAYNE BABCOCK, M.D.

PHILADELPHIA

In 1930, having observed marked advantages of a perineal colostomy in resections of the pelvic colon, I eliminated a permanent abdominal opening in any case in which the lesion was considered surgically removable. Since this change in technic 220 patients with cancer of the large intestine have been treated by operation. In twenty-six instances the disease was so advanced that only an exploration or colostomy was done. In 103 the rectosigmoid was resected with the formation of a perineal anus but without sphincter control. After the first three or four months of adjustment these patients have been very appreciative of the perineal opening, quite different from the attitude of many who have been left with an abdominal colostomy. An abdominal colostomy necessitates a pad or other protection. With an adequate perineal opening, although without sphincter control, 5 per cent of my patients require no local protection, special diet or other measure to prevent soiling; 50 per cent by regulated emptying of the colon and some restriction in diet are enabled to dispense with a pad much or all of the time; 30 per cent find the constant wearing of a pad desirable although it is infrequently soiled, while 15 per cent, chiefly those careless as to diet and personal hygiene and those with local recurrence, report frequent soiling.

But the person best able to evaluate the perineal as contrasted with the abdominal colostomy is the man who has had both. Such evidence is presented by four patients for whom I have moved an abdominal colostomy to the perineum. The abdominal colostomy had been present for from seven months to eleven years and in three instances it was well formed and uncomplicated.

CASE 1.—Dr. H. S., aged 47, in September 1936 had a one stage abdominoperineal proctosigmoidectomy for carcinoma. A well formed median abdominal colostomy resulted; evacuations were controlled by colonic irrigations every eight hours.

Nov. 27, 1937, transplantation was made of the colostomy with an attached ring of abdominal skin to a sphincterless perineum. The patient was ambulant and discharged from the hospital ten days later.

March 1939 he reported a gain of more than 15 pounds (6.8 Kg.), no incontinence, escape of gas only once or twice daily, and ability to use a more varied diet than with the abdominal colostomy. The colon is emptied every other morning by a plain or salt water enema, between which times he is free from soiling.

CASE 2.—Miss M. H., aged 58, had been treated for mucous colitis with diarrhea for eighteen months when vaginal bleeding from invasion of a rectal carcinoma developed.

April 21, 1938, a one stage abdominoperineal proctosigmoidectomy, panhysterectomy, vaginal resection and left inguinal colostomy were done. Small cancerous nodules were palpated in the liver.

By October 27 she had lost her cachectic appearance and had gained 8½ pounds (3.8 Kg.) but had had to give up her work in a bank because of offensive gaseous discharges from the colostomy.

Read before the Section on Gastro-Enterology and Proctology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

November 3 the colostomy was moved to the sphincterless perineum. The nodules in the liver had enlarged.

November 13 she was out of bed; the colostomy was nearly healed.

December 1 she reported that each enema is followed by freedom from movement for three days. There is much less discharge of gas, better control and warning and less care and more comfort than with the abdominal colostomy.

In April 1939 there was increasing weakness with enlarging liver.

CASE 3.—Mrs. F. H., aged 32, weighing 90 pounds (40.8 Kg.), had had increasing diarrhea for two years with occasional blood spotting, recurrent abdominal cramps for six months and rectal distress for four weeks. The diagnosis was cancer of the proctosigmoid, infiltrating the uterus, upper part of the vagina and the region of the right ureter.

March 31, 1938, a one stage abdominoperineal proctosigmoidectomy, panhysterectomy, partial colectomy, resection and anastomosis of the right ureter, incision of the bladder and left inguinal colostomy were done. Postoperative herniation of the ileum into an open drainage tube and secondary ileal, ureteral and vesical fistulas occurred.

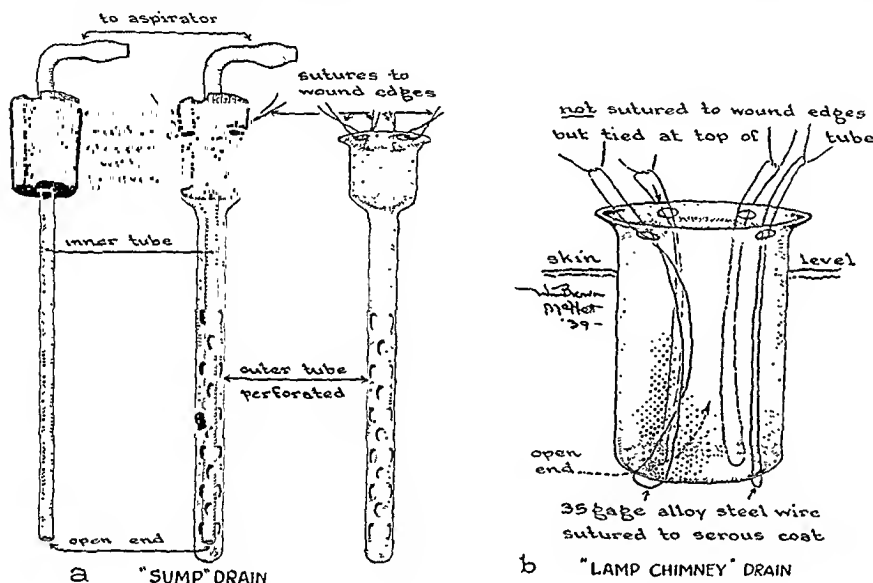


Fig. 1.—(a) The sump drain is valuable in the prevention of spreading peritonitis by keeping the peritoneal cavity free from blood, serum and contaminating fluids during and after the operation. Aspiration, most conveniently produced by a miniature electric pump and collection bottle, should be continuous for the two or three days after operation, that the general peritoneal cavity may be drained by glass. These tubes, of any desired diameter, length or curve, may be made by any glass blower. (b) Glass lamp chimney drain, to be anchored by four alloy steel wire sutures over intestinal suture lines or septic or necrotic areas. These glass tubes, from 2 to 6 cm. in diameter, enable the daily inspection of questionable healing processes within the body and provide a large vent for fecal and other drainage. Differing from gauze and rubber drains, the glass is not walled off by adhesions for several days. These drains should not be used unless they are so anchored that viscera will not enter and herniate.

In July 1938 abdominal closure of ileoperineal fistula was done.

Jan. 27, 1939, transplantation of the abdominal colostomy to the perineum was done, with closure of the vesical fistula and a secondary temporary ileostomy.

April 2 a right nephrectomy was done for the uteroperineal fistula.

April 13 she weighed 105 pounds (47.6 Kg.). She was in excellent condition. Evacuations were produced only by enema every third day. There was no evidence of recurrence. There was a marked improvement over the abdominal colostomy.

CASE 4.—S. B., a man aged 60, had a two stage proctosigmoidectomy for carcinoma with a left inguinal double barreled colostomy in 1927, followed by an incisional hernia and massive eventration of the proximal and distal loops through the colostomy opening. The colostomy required hours of attention daily. There were recurrent draining sinuses in the perineal scar for which six or more operations had been done. Pollakiuria and nycturia were present for two years following irradiation.

Dec. 5, 1938, the abdominal colostomy was transferred to the sphincterless perineum with excision of redundant bowel and distal loop. Repair of the incisional hernia was accomplished with buried alloy steel wire sutures. The adherent bladder in the perineal scar was entered and sutured.

April 1939 the condition is much improved. There are bowel movements only with enemas, without interval soiling. Pollakiuria is decreasing.

These four patients offer impressive evidence of the superiority of the perineal outlet. It is less messy and more convenient to care for. It requires little or no local protection. Fecal discharges are infrequent and occur with better warning and the expulsive effort of the abdominal muscles is more effective. Escaping flatus is not as obvious and apparently is better controlled, the pressure of the buttocks being an added restraining factor.

The perineal opening also enables the early detection of a pelvic recurrence by palpation. Thus in six cases a recurrent nodule was detected and excised at a relatively early stage. Three of these patients are now living without palpable recurrence from two to more than four years after the last operation. Without the diagnostic advantage of the perineal opening, such recurrences may reach an inoperable stage before detection.

The site of the colostomy may influence marriage, as in the case of the woman of 32 who insisted that the abdominal opening be moved to the perineum. A second patient after an abdominoperineal proctosigmoidectomy with perineal opening at 27 has married and is considering pregnancy at the age of 31.

As with an abdominal colostomy, the comfort of the patient with the perineal opening depends largely on determining and utilizing the storage function of the colon. If the patient regularly empties the colon just before its capacity has been reached he will, as a rule, have freedom from evacuation for from twenty-four to seventy-two hours. Most patients obtain the best results from a physiologic solution of sodium chloride or tap water enema

taken in the morning or evening every twenty-four to seventy-two hours. For the seventy-two hour schedule a low residue diet the day after the enema followed by a full diet the day preceding the enema often works well. About 20 per cent of the patients, however, prefer a small dose of a quickly acting saline laxative, such as one or two teaspoonfuls of sodium sulfate taken in a little cold water immediately on arising. Soon after breakfast, which includes a cup of hot coffee, the colon empties, after which constipation follows for the two or three days it is found feasible to wait before repeating the laxative. A few of the patients prefer the action of a small amount of castor oil, which with them leaves a more secure secondary constipation. Of course, liquid petrolatum or laxatives of delayed or prolonged action should not be used. In any case the perineal orifice should be of adequate size. A narrow or stricture!

PERINEAL COLOSTOMY—BABCOCK

1935

outlet prevents the rapid and complete emptying of the colon, and consequently small, frequent and annoying discharges from overflow result. This should be overcome by dilation, the patient daily inserting test tubes or other dilators. A redundancy or protrusion of the mucosa of the sigmoid may cause an unpleasant local moistness, easily corrected without anesthesia by linear galvanocauterization or the injection of a 5 per cent solution of quinine and urethane. A perineal hernia is apparently less common than the hernia often seen about an abdominal colostomy. In two of my cases, however, I have operated for such a perineal protrusion.

TECHNIC

In the formation of a perineal colostomy the method described in 1932¹ has been used with modifications. Since the bowel may be accidentally entered during the operation, the rectum should be cleansed by thorough irrigation and packed with three or four gauze sponges wet with one half strength tincture of iodine or with tincture of mercury bichloride immediately before the operation. A 14 F. soft rubber catheter should be fastened in the bladder to be removed after forty-eight hours.

Spinal anesthesia from an intradural injection of 10 mg. of pontocaine hydrochloride mixed with 50 mg. of procaine hydrochloride is favored on account of its prolonged action. Usually this is followed by from 100 to 250 cc. of a 1 per cent epinephrinized procaine solution, injected locally. During the operation, if the patient is asthenic, from 500 to 1,000 cc. of 5 per cent dextrose, possibly followed by typed citrated blood, is slowly run into a vein.

For the patient in very poor physical condition, the following method of anesthesia has been found of advantage: A slow intravenous infusion of 5 per cent dextrose is started and continued during the operation. As the patient slowly counts, a 2.5 to 5 per cent solution of evipal soluble is injected through the rubber tube close to the intravenous needle, at the rate of about 1 cc. every ten seconds. When the patient stops counting, the evipal soluble is discontinued, the abdominal incision is quickly made and the abdominal wall and subperitoneal layers are freely infiltrated with a 1 per cent solution of procaine hydrochloride containing 1 minim (0.065 cc.) of epinephrine to each 10 cc. With a pump syringe and a 20 or 22 gage needle from 250 to 500 cc. of the solution is injected. With this combination little additional amounts of evipal soluble may be required so that the patient may doze through an operation lasting an hour and a half from a total of only 0.6 or 0.8 Gm. of evipal soluble. If indicated, carefully typed citrated blood follows the infusion of dextrose. With these methods of anesthesia it is not uncommon to find the patient in better condition at the end than at the beginning of an extensive operation, and in no case as sufficient shock occurred to prevent the completion of a radical one stage operation.

In recent years most of my operations on the colon have been made through nearly transverse incisions of the muscle splitting, rectus retracting type. These incisions reduce the exposure and possible contamination of the general abdominal cavity and leave a stronger and better scar than vertical incisions. They are especially adapted for the exteriorization of the diseased loop in a Mikulicz-Paul operation. For an abdomino-

perineal one stage proctosigmoidectomy the incision usually is made parallel with and 3 cm. above the left inguinal ligament.

The liberation of the rectosigmoid follows the conventional plan with the peritoneum divided wide of the diseased pelvic colon and the inferior mesenteric and superior hemorrhoidal vessels doubly ligated and divided rather close to their points of origin. If there is evidence of invasion of the prostate or vagina, this part of the dissection is delayed and made through the perineal wound. A long tape of folded gauze is tied around the sigmoid at the level that will be used to form the perineal anus. This portion of free sigmoid should reach at least 12 cm. (5 inches) below the posterior brim of the pelvis. It should be viable as proved by pulsating vessels; otherwise the descending colon is mobilized sufficiently to enable living intestine to be brought to the perineum. Without forming a pelvic diaphragm, the tape is packed against the floor of the pelvis, the liberated rectosigmoid laid on it and the abdominal wound closed in layers with 32, 30 and 35 gage interrupted alloy steel wire sutures. With this suture material I have had better healing than with catgut in clean and especially in contaminated wounds, and there has been no eventration. If there has been pelvic contamination, a glass "sump" drain is introduced through the abdominal wound and connected with a suction pump while the patient is on the operating table, the aspiration being continued for the first two or three days.

With the patient changed to the lithotomy position the perineal part of the operation is made in one of the following four ways. In any case the anus is first closed with a strong purse string suture and in no case is the withdrawn sigmoid sutured to other tissues.

A. When the cancer has invaded the anorectal region and pelvic floor an anteroposterior elliptic incision wide of infiltrated tissue is made round the closed anus and carried through the pelvic floor to the gauze tape and liberated rectosigmoid, which are withdrawn and a 2 cm. perforated tubular glass drain is introduced posteriorly along the hollow of the sacrum. The wound is lightly closed around the withdrawn rectosigmoid, dressings are applied and the bowel and attached tissue then cut away. A 28 F. rectal tube is introduced and tied in the protruding sigmoid.

B. When the cancer is well above the pelvic floor and is freely movable, a nearly median incision is carried through the pelvic floor from the posterior border of the closed anus along the right side of the coccyx. With the wound well retracted, the tape and attached intestine are gently eased through, care being taken not to make traction on friable cancerous intestine. A perforated glass drain is inserted along the sacrum. Dressings having been applied, the protruding rectosigmoid loop is cut away and tubes are tied in the anal and sigmoid ends, after the anal purse string suture and neighboring gauze packing have been removed. A week later the partitions between the anus and the rectum and the rectum and the sigmoid are divided and the edges sutured, converting the three orifices into one.

C. A somewhat better result has more recently been obtained by dividing the rectal end of the loop just above the sphincters, dividing the anal ring posteriorly and placing the sigmoid in the anal gutter. The intestine is not sutured. The danger of infection from the antisepticized anal mucosa in contact with the wound is not great if there is adequate glass tube drainage.

1. Babcock, W. W.: The Operative Treatment of Carcinoma of the Rectosigmoid with Methods for Elimination of Colostomy, Surg., Gynec. & Obst. 55: 627-632 (Nov.) 1932.

D. When the cancer is attached to the prostate or posterior vaginal wall, an incision curving forward from one tuber ischii to the other is used. The traction tape has preferably been packed somewhat anterior to the rectum. In women an elliptic excision of the posterior vaginal wall is made. The attached vaginal wall or resected portion of the prostate is delivered *en masse* with the rectosigmoid. The rectum is divided by cautery between clamps just above the sphincters, the anal ring being divided anteriorly to avoid constriction and the sigmoid laid but not sutured in the anal groove.

ation is nearly finished. The tied-in rectal tube prevents fecal soiling of the wound until after the drain has been removed and primary adhesion obtained.

The operation may be so planned as to be very radical. From 25 to 65 cm. of intestine with attached lymphatics and soft tissues are delivered through the perineum and removed. In four cases an invaded uterus with appendages and part of the vagina were removed with the rectosigmoid. In others, portions of the vagina, prostate, bladder or small intestine have been resected. In two patients the ureter was divided or

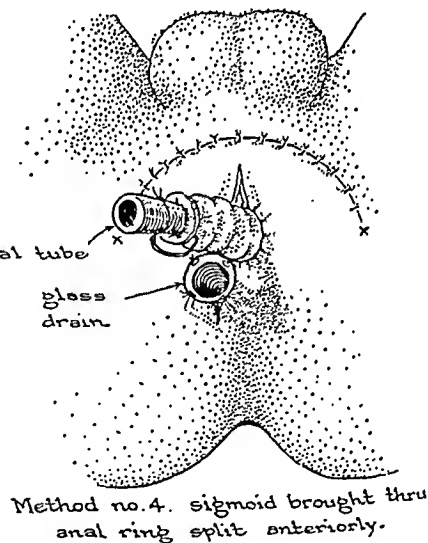
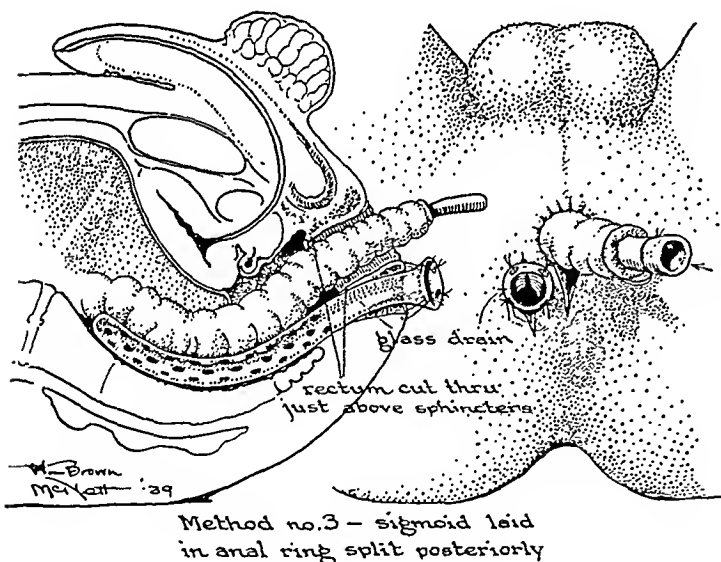
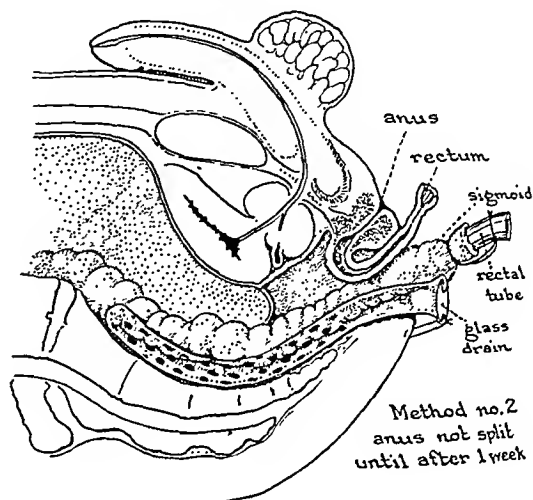
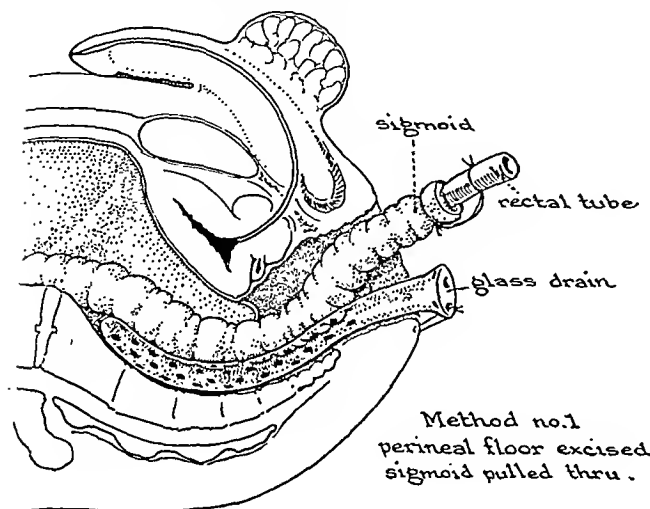


Fig. 2.—Methods of forming a perineal sigmoidostomy: The rectosigmoid, liberated through an abdominal incision, is pulled through the perineum with an attached tape. Method 1, for low lying carcinoma. The anorectosigmoid with lymphatics and pelvic floor has been withdrawn and excised after the placement of dressings. Method 2, the rectosigmoid loop has been withdrawn through a postanal incision. After one week the three openings will be made one by division of the two intermediate partitions. Method 3, the rectosigmoid has been delivered and removed through a postanal incision and amputated and the sigmoid laid but not sutured in the split anus. Method 4, for growths of anterior rectal wall attached to the prostate. The diseased tissues are delivered through an anterior curved incision and removed and the sigmoid end is brought through the anus, which is split anteriorly.

A 2 cm. curved perforated glass tube drain is carried through a stab wound at the right side of the coccyx along the sacrum. The anterior perineal wound and vagina are closed without tension, preferably with buried layer sutures of alloy steel wires. After the dressings are in place, the protruding sigmoid is cut away and a soft rectal tube tied in. It will be observed that the technic eliminates bacterial contamination from crushing or suturing the bowel and that the diseased segment need not be entered or excised until the oper-

ation is nearly finished. The tied-in rectal tube prevents fecal soiling of the wound until after the drain has been removed and primary adhesion obtained.

As the divided sphincters are often retained, a secondary plastic reconstruction of the anal ring was tried in a few of the early cases. Most patients, however, soon learn to regulate their evacuations so well that they consider such an additional operation unnecessary. In some the motor innervation of the muscles has been damaged. In any case a tight or strictural

anal opening gives much more trouble than a wide open one that is properly cared for.

Stage operations to divide the operation into steps or to enable what is at best an inadequate cleansing of the cancerous segment of intestine have not been found of advantage. To the dangers of the first stage there is added a second stage made more difficult by post-operative adhesions and complicated by the danger of contamination of the wound from the openings of the

TABLE 1.—Operations for Cancer of the Intestine, 1930-1939

Ages.....	20-29	30-39	40-49	50-59	60-69	70-74	75-79	Total
Number.....	3	17	50	75	53	15	7	220
Per cent.....	1.4	7.8	22.8	34	24.2	6.6	3.2	

colon on the abdomen. I have found that the single stage operation may be done with greater facility, in shorter time and with no greater shock than the second stage of the two stage operation. A preliminary enterostomy or an appendicostomy (which may be gradually dilated to admit a rectal tube) is, of course, important if there is preoperative intestinal obstruction.

Perineal proctectomy or proctosigmoidectomy with a perineal anus for cancers lying below the peritoneal reflection is a safer operation (mortality in forty-one cases, 4.5 per cent) than the abdominoperineal operation but has important disadvantages. It does not enable an abdominal exploration, radical removal of tributary lymphatics or, in many cases, an adequate blood supply to the retained bowel. If more than from 15 to 20 cm. of bowel is removed the end of the sigmoid brought to the perineum usually sloughs, and a stricture and cicatricial anal opening results. Nevertheless, on account of its greater safety I consider it the operation to be selected for the lower lying rectal cancers when, because of great obesity, senility or grave organic disease, the mortality of an abdominal operation would be high. An example is a man weighing 278 pounds (126 Kg.), who had an uncomplicated recovery from the perineal operation. As with the combined operation, a perineal glass drain is desirable.

After an abdominal colostomy a collateral circulation to the terminal bowel develops and the retained portion of sigmoid may elongate—conditions favorable to the transfer of an abdominal colostomy to the perineum. The opening is plugged with antiseptic gauze and closed with sutures. The liberated end of the intestine

injure the urethra or bladder, the perineal scar is opened from below and the tape and attached sigmoid are pulled through. A glass tube drain is introduced at the side of the coccyx or through the incision back of the sigmoid. If a ring of abdominal skin has been brought down with the bowel, it may be sutured to the edges of the perineal wound; otherwise the sigmoid protrudes through the perineal wound without suture. It is desirable to fasten a rectal tube in the sigmoid so as to prevent soiling during the first few days after the operation. The glass drain is usually removed in from twenty-four to forty-eight hours.

Palliative colostomy for advanced and inoperable carcinoma of the colon is to be deprecated. The post-operative hospital mortality in my experience is 27 per cent, and often it seems better to use simple decompressive methods or let the patient die obstructed, soothed by opiates and perhaps an intradural injection of alcohol, than to render his last days a burden and offense to himself and friends by a colostomy.

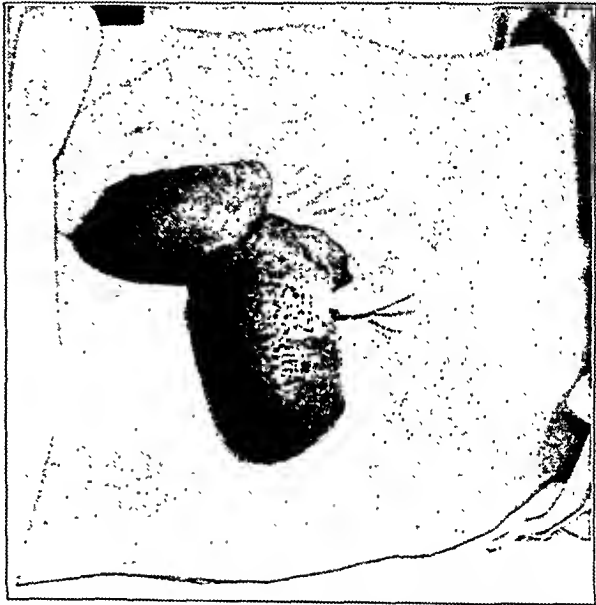


Fig. 3 (case 4).—Colostomy with incisional hernia and prolapse of proximal and distal segments, previous to resection and transfer to the perineum.

I have seen no worth while benefit, and much unnecessary suffering, from the use of x-rays or radium in large dosage in the treatment of well advanced carcinoma of the large intestine or as a prophylactic postoperative treatment.

Ileus is a fairly frequent complication after resection of the large intestine. When not due to diffuse purulent peritonitis, the mortality under proper treatment should be low, for recovery usually follows a simple but early decompression of the distended bowel. Rectal and duodenal tubes with aspiration are first used. If no relief follows, the most distended intestinal coil is carefully localized by physical signs and an overlying 3 to 6 cm. muscle splitting incision made. A small portion of the distended coil is withdrawn, occluded with a soft rubber covered clamp, and a fine silk purse string suture introduced, with which a 14 F. soft rubber catheter is tied in. The intestine is anchored to the edge of the incision, and the small wound is closed around the catheter. Gentle continued irrigations with warm saline solution are continued until the intestine is decompressed. After the decompression the obstruction usually disappears in from twenty-four to seventy-

TABLE 2.—Radical Operations for Cancer of the Colon and Rectum Since January 1930

	Deaths	Mortality
Resection and End to End or End to Side Anastomosis	13	25 %
Total cases, 34	3	5.8%
Early cases, 18	4	22 %
Recent cases, 16	1	6.2%
Mikulicz Operation		
45 cases	9	20 %

is covered by a cap of gauze and rubber dam securely tied on with a long tape. The sigmoid segment and, if necessary, the descending colon are then sufficiently mobilized from peritoneal and other attachments to slide at least 12 cm. (5 inches) below the posterior pelvic brim. The soft tissues in the midline close to the sacrum are divided and then tunneled to the pelvic floor until a channel is formed through which the sigmoid may easily be drawn. The tape is packed in this tunnel, the end of the sigmoid laid over the opening and the abdominal wound closed. With care not to

two hours, but the tube should be left in place a week or more. Common mistakes responsible for mortality are delay, prolonged exhausting procedures, as in using evacuants or the Miller-Abbott tube, large abdominal incisions with eventration, introduction of the hand into the abdomen, attempts to liberate adherent intestine, and the use of large caliber rubber tubes for the colostomy, which may cause perforation. If intestinal coils continue to be distended, additional simple enterostomies should be done. Thus in one case an ileostomy, cecostomy and finally a transversostomy was done before relief was obtained. With diffuse purulent peritonitis the mortality is, of course, much higher, but a percentage of the patients can be saved by a similar type of enterostomy or enterostomies and the use of "sump" drains.

Metastasis to the liver was found in twenty-nine cases at operation. In nine the invasion of the liver was far advanced or the primary lesion inoperable. A palliative colostomy was done in six and simple exploration in three. In the remaining twenty cases the

postoperative distention or distress. Not infrequently they were out of bed by the tenth or twelfth day and were discharged from the hospital a few days later. But 25 per cent of the patients died, usually from peritonitis. In separating and delivering cancerous colon, recognized or unrecognized breaks in the bowel or in overlying contaminated tissues frequently occur. The liberated bacteria multiply in residual blood and wound secretion and diffuse in the serum of the peritoneal cavity, causing a spreading peritonitis. Therefore it was found desirable to keep the abdominal cavity free from blood and fluid until isolating adhesions had formed. Four years ago I introduced a method of "internal exteriorization" by anchoring glass tubes of large caliber (lamp chimney drains) over septic intraperitoneal areas or lines of intestinal suture where leakage was feared. Through these open tubes I have observed day by day the very slight reaction of the human peritoneum to glass or air. With glass drains the general peritoneal cavity remains open, free from adhesions and drainable for from forty-eight to seventy-

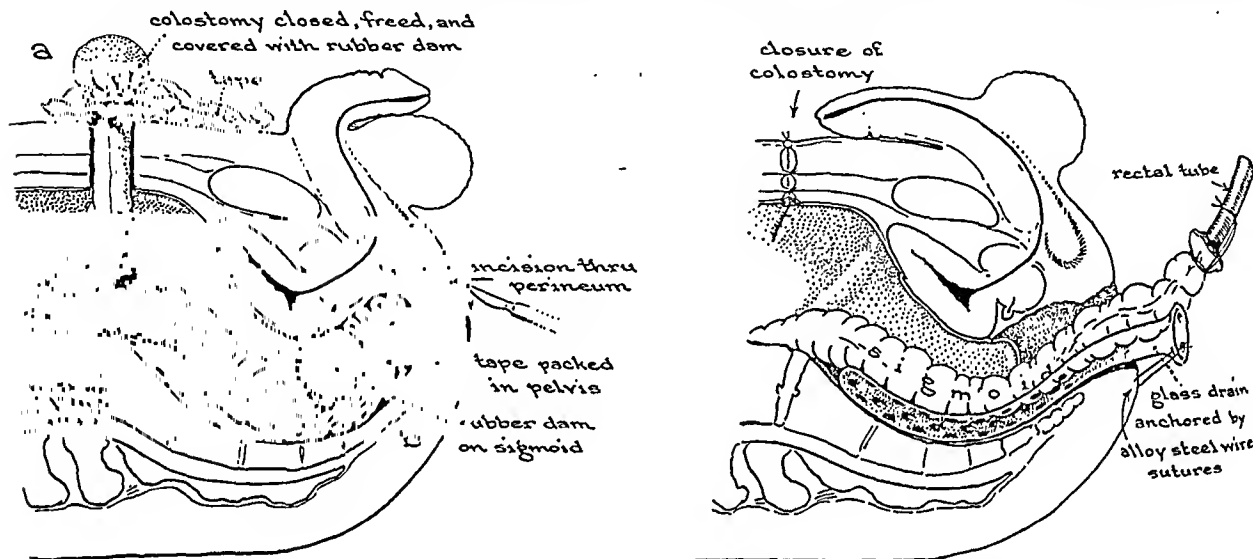


Fig. 4.—Transfer of an abdominal colostomy to the perineum. *a*, the colostomy is occluded by a cap of gauze and rubber tied on with a long gauze tape. The tape is then packed against the partly tunneled pelvic floor and the abdominal wound closed. *b*, through a perineal incision the tape is grasped and withdrawn with the end of the liberated sigmoid. A perforated glass tube drain is introduced along the sacrum and a rectal tube tied in the protruding sigmoid.

primary growth was resected, with three deaths (15 per cent mortality). A proctosigmoidectomy was done in thirteen, a Mikulicz-Paul stage resection in five and resection with end to end anastomosis in two. The radical operation relieves the patient of obstructive and toxic symptoms and the progressive involvement of the liver usually is painless and at times quite slow. Of the seventeen patients surviving the radical operation, most have survived more than one year and four more than two years. One woman at 75 considers herself in relatively good health more than four years after resection of the splenic flexure.

MORTALITY

Peritonitis has been the predominant cause of death after operations on the colon. By the methods described, the proctosigmoid may be liberated, exteriorized and opened and removed only after the wounds have been closed and dressings have been put in place. Thus the bacterial contamination incident to crushing, dividing or suturing the colon is eliminated. In my earlier experience the wound was closed with little or no drainage. Most of the patients after such a single stage operation then had a rapid recovery with little

two hours. In the dog's abdomen glass tubes and alloy steel wire were found entirely free at the end of two weeks, while gauze, rubber, catgut, silk, cellophane, lucite and wood were buried in plastic exudate and adhesions. Therefore I turned to glass drains and to alloy steel wire sutures and ligatures.

To be efficient, the drain must be dependent or be continuously aspirated by a nontraumatizing suction ("sump" drain). Large tubular glass "lamp chimney" drains anchored over insecure intestinal suture lines or purulent or necrotic areas were found very valuable but if the peritoneal end of the tube is not occluded, an intestinal coil may enter and strangulate, as occurred in three of my cases. With improvements in drainage, the mortality from the single stage proctosigmoidectomy has dropped from 25 per cent to 5.8 per cent, and the mortality from end to end anastomosis of the colon from 22 to 6.2 per cent (table 2). The mortality indicates postoperative deaths occurring during the patient's stay in the hospital. It does not include two deaths of patients with metastatic carcinoma of the lungs or of one patient who could not have the proposed proctosigmoidectomy completed on account of widespread cancerous infiltration in the pelvis. As indicating that

with better drainage peritonitis is not the predominant cause of death, the more recent mortality from proctosigmoidectomy has been due to thyroid crisis from massive intrathoracic goiter (one case) and pyoderma of the abdominal wall (one case).

Operations on patients with perforated carcinoma of the intestine with abscess, internal or external fistula and necrotic soft tissues usually carry a high mortality. This was an important factor in my mortality with the Mikulicz-Paul stage resection (20 per cent). Recent experience indicates that this figure also may be sharply reduced by well placed tubular and aspirating glass drains. In my general series the bladder was invaded in five, the uterus or ovary in five, the ileum in three, the pancreas and jejunum in one and the stomach and jejunum in one, while the vagina or prostate was invaded in several cases. As a rule, the invaded part was resected or removed.

SUMMARY

Superiority of the perineal over the abdominal artificial anus is evidenced by 103 operations in which the sigmoid was brought to the perineum and four operations in which an old abdominal colostomy was transferred to the perineum.

With a perineal colostomy most of the patients are able to dispense with pads or other local protection.

There is slight peritoneal plastic adhesive reaction to glass or alloy steel wire as contrasted with a marked reaction to gauze, rubber, catgut, silk and other substances.

Special glass drains are introduced which have proved of value in preventing and treating peritonitis following resection of the large intestine.

There is a simple and effective operation for post-operative ileus.

Colostomy and heavy irradiation should not be employed in the terminal stage of intestinal cancer.

Alloy steel wire is valuable in the abdominal and perineal closure of clean and contaminated wounds incident to the operations on the intestine.

1720 Spruce Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SWINTON AND WARREN
AND DR. BABCOCK

DR. C. F. DIXON, Rochester, Minn.: The paper dealing with colonic and intestinal polypi emphasizes what can be accomplished if several such lesions are diagnosed early. Robertson is of the opinion that 50 per cent of malignant lesions of the colon and rectum arise from polypi. The classification the authors have worked out seems sound. Polypi of the large intestine may be broadly classified in two groups: Those which stud the mucosa of the colon and rectum would comprise one group. Sometimes one encounters several patients having this condition among members of the same family; no doubt there is a familial tendency toward the disease. Not infrequently the predominant symptom of such patients is hemorrhage of a varying severity. Total colectomy is often indicated. Occasionally, however, the surgeon is able to perform subtotal colectomy and anastomose the ileum to the rectosigmoid and later fulgurate through a proctoscope the polypi within the lower bowel. It has been my experience that a malignant condition invariably develops if these patients do not receive radical surgical treatment. The second group is that in which one or more polypi invade the rectum or colon. The condition is not diffuse polyposis, as is that of the first group. In the case of discrete polyps of the pedicled type, the surgeon may make a trans-colonic approach, remove the lesion along with its stalk and feel sure that a sufficiently radical procedure has been carried out. If the polyp is sessile, as a rule a segmental resection is in order. Fulguration of rectal polypi is often sufficient. However, patients having such polypi should be examined at frequent

intervals. If recurrence is found, further treatment, such as fulguration or resection, should be carried out. The improvement in roentgenologic diagnosis has been a greater step forward in the detection of polypoid lesions of the colon than many realize. Formerly, even though the patient gave a history of bleeding by rectum, roentgenologic observation after a barium sulfate enema would not disclose the presence of a polypoid lesion. Now, by means of the contrast method, expert roentgenologists are able to determine the presence of a polyp which may be no larger than a pea. Regarding the other paper, perineal resection for carcinoma of the rectum and rectosigmoid, without the establishment of an abdominal colonic stoma, will of course not meet with the approval of every one. At present I do not feel qualified to make a definite statement to the effect that any one type of resection for cancer of the rectum or rectosigmoid should be employed as a routine.

DR. W. J. MARTIN JR., Louisville, Ky.: A few years ago it became apparent to me that a good many polyps were being found in my routine examinations of private patients. On collecting these cases it was rather astounding to find that sixty-three polypoid lesions had been found in 1,500 routine sigmoidoscopic examinations, giving an incidence of 4.2 per cent. This is ascribed to three or four factors. One is absolute cleanliness of the bowel. A great number of polypoid lesions are probably missed because so many sigmoidoscopic examinations are done on bowels which are not properly prepared. Another important factor is the position of the patient when one is examining him. The inverted position, with head down, which lowers the diaphragm and allows the lower bowel to be straightened and smoothed out, brings out more clearly any eminence that might be present. Another factor of great importance is proper lighting of the examining instrument. Reflected or proximal lighting is not thought to be as satisfactory as distal lighting. The distal lighting gives a cross light which makes the smaller masses stand out more clearly. Another factor of importance is the preparation of these patients for the roentgenologic examination. Absolute cleanliness is imperative because small amounts of waste material in the bowel may be mistaken for polypoid lesions or vice versa. In some cases of obscure pain or tenesmus in the bowel, with proper roentgenologic examination pedunculated lesions were demonstrated, which was thought to account for the pain. It is believed that if those factors are followed in routine sigmoidoscopic and roentgenologic examinations more of these polypoid lesions will be found.

DR. LOUIS J. HIRSCHMAN, Detroit: Too many of us have been prone to fit the patient to the type of operation rather than fit the operation to the individual patient. The ideal way in which to remove a carcinoma of the rectum and rectosigmoid is the type of operation in which one makes an abdominal incision and can see and feel not only the neoplasm but the surrounding bowel as well and get a good idea of where there are palpable metastases to the liver. When there are large nodules in the liver it is unfair to subject the patient to a great deal of surgery. In the past in some localities there have been many colostomies improperly performed, which have thrown colostomy into disrepute. When a patient is told "You have a carcinoma which should be removed and you must have a colostomy," he replies "I won't have it. So-and-so in my neighborhood has one and nobody will go near him." It is necessary to break down the prejudice of the individual to the colostomy, and there are few patients who absolutely refuse. What most of us consider the ideal is an abdominal colostomy. I prefer a centrally located colostomy to one in the lower left quadrant, for cosmetic reasons. The patient doesn't have a telltale bulge through the clothing, particularly if the patient happens to be a woman and happens to be thin. For this and other reasons a centrally located colostomy is much more to be desired. There are still a few patients who will not submit to an abdominal colostomy, and for those one must have an operation like Dr. Babcock's or the old James Tuttle operation to fall back on. I have performed them, and, strange to say, those patients seemed to get along pretty well. I don't think the incidence of recurrence was any worse and at least they were happy in having the colostomy where they wanted to have it. So far as I am concerned, if a patient wants to keep clean, he had better have it where he can see it rather than some place where he can't see it.

DR. FRANK H. LAHEY, Boston: I am sure that you as gastro-enterologists are interested in whether a colostomy in an operation for cancer of the rectum is in front or in back, but I am equally sure that that is not the problem I should discuss with you. After all, that is a technical problem for surgeons to have their individual opinions about. The most interesting part of Drs. Swinton and Warren's statistics has to do with the fact that they have taken 100 cancers of the rectum, 100 cancers of the left colon and 100 cancers of the right colon, all proved by removal at operation, and demonstrated that, in terms of pain, altered bowel function or blood in the stools, 97.7 per cent of these cases give such evidence. In other words, when but 2.3 per cent of 300 proved cases of cancer of the colon and rectum fail to have in the history the evidences of an alteration in bowel function, the diagnosis should be made earlier than it is. Another thing that ought to interest gastro-enterologists is figures of nonrecurrence after radical removal in malignant lesions in these locations. Forty-seven per cent of our patients with carcinoma of the rectum who have had the radical operation are alive and well over five years without recurrence, and 42 per cent of those whose colons were affected. Equally good figures have been reported by other surgeons who are particularly interested in this subject. They do demonstrate, however, that this is a particularly favorable lesion from the point of view of five year nonrecurrence. I do not want to discuss the technical side of surgery of cancer of the colon and rectum but I do want to present some convictions to you as gastro-enterologists which I think are important and which I definitely think have to do with increasing the number of patients who are cured or at least have long periods after operative procedures without recurrence of the lesion. At the Lahey Clinic we are seeing patients in considerable numbers with carcinoma of the colon and rectum, who have had their abdomens opened and have been closed as inoperable when we have proved by reoperation that they were not inoperable. I speak particularly of the matter of contact carcinomas.

DR. NEIL W. SWINTON, Boston: I was interested to hear Dr. Dixon's remarks on the comparison of these polyps. I think we are particularly indebted to Dr. Martin for his emphasis on the necessity for careful preparation of these patients for proctoscopy and sigmoidoscopy. Adequate preparation makes it possible to examine carefully all of the mucosa surface of the rectum and rectosigmoid so that no polyps will be missed.

DR. W. WAYNE BABCOCK, Philadelphia: Abdominal discomfort, usually not recognized as colic, which may follow intake of food or other exciter of peristalsis, is the common but often ignored first symptom of intestinal carcinoma. It may precede melena or obvious change in bowel habit by months or even a year or more. In my experience nearly all patients object to an abdominal colostomy, while those with a functional perineal opening are grateful that it is not on the abdomen. Those who have had the abdominal opening moved to the perineum tell us that they are now more constipated, have much less soiling or escape of offensive gas and better expulsive effort than before, and that the opening is much more conveniently cared for. The gas from the abdominal colostomy was so objectionable that the woman bank clerk mentioned had lost her job, while the physician as well as a business man who had found it necessary with the colostomy to irrigate several times a day now can go without a pad by emptying the colon by enema once every three or four days. With a perineal opening one young woman has married, while a second has had an abdominal colostomy transferred, apparently in the belief that she could then marry. Possibly evacuations and the discharge of gas are less frequent with the perineal opening because the colon can then be more conveniently irrigated or completely emptied. Irrigation and thorough emptying of the colon with the necessary use of large quantities of water is a messy procedure with the abdominal opening, even though the patient sits in a bath tub. The colon may be compared to a storage tank that overflows when filled. Thus soiling from a colostomy opening is a sort of "incontinence of overflow," which usually can be obviated by regulated emptying of the large bowel: the patient must find out for himself whether this should be every day or every three or four days.

Except with patients with stricture or recurrence or those of such social or mental status that they cannot or will not attend to personal hygiene, there should be little involuntary soiling with a perineal colostomy. However, usually it requires about three months after the operation for a regulated adjustment to be established. Finally, the expulsive action of the abdominal muscles is more effective when the opening is on the perineum than when it is above and then I think the apposed buttocks offer some bar to escape of gas, which therefore is retained and in part absorbed.

SOME PROBLEMS IN THE PATHOLOGY OF NEUROTROPIC VIRUSES

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With regard to virus infections of the nervous system, generalizations are of limited validity. In the study of any single disease, plurality of strains of the virus, relative susceptibilities of various experimental animal species and differences between natural and experimental hosts offer serious complications. And different diseases seem to behave in quite different fashion. Only isolated data are available, and inferences can be suggested rather than proved.

With this word of caution, three arbitrarily selected topics may be critically examined.

THE SIGNIFICANCE OF THE NASAL PATHWAY IN INFECTION.

The possible importance of the nasal pathway in poliomyelitis has received the attention of investigators for many years. In 1912 Flexner and Clark¹ showed that monkeys might be experimentally infected by the application of virus into the nose and that in such cases the virus localized first in the olfactory bulbs. Faber and Gebhardt² demonstrated the orderly progression of the virus through the neuraxis, following intranasal instillation, in a manner consistent with the hypothesis of nerve spread. If the nasal pathway is interrupted, instillation of virus is without effect. Brodie and Elvidge³ and Schultz and Gebhardt⁴ proved the effectiveness of surgical interruption, while Armstrong and Harrison and others⁵ showed a similar protective

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effect from chemical tanning of the nasal mucosa prior to attempts at infection. According to Lennette and Hudson⁶ intravenous administration of virus to animals whose olfactory paths have been surgically interrupted is without effect, although controls died. Armstrong⁷ showed that tanning of the nose greatly reduced the effectiveness of intravenous administration. This work suggests that virus in the blood stream is first deposited on the olfactory mucosa and from there passes into the brain.

It is of importance to recognize that most of the work just mentioned was done with strains of virus that are relatively noninfectious by subcutaneous or other methods of inoculation. Recently Sabin⁸ has shown that the tonsillopharyngeal region is more sensitive to injections of virus than many other regions of the body. This and the work cited, coupled with the observations of Aycock and Luther⁹ that in many cases bulbar poliomyelitis in man follows tonsillectomy, strongly implicate the nose and nasopharynx together as the normal portal of entry in the natural disease.

Strong and independent supportive evidence is furnished by the recovery of virus by numerous investigators from the nasal washings of human patients in various stages of the active or abortive disease or of healthy carriers. This work has recently been summarized by Kramer and his associates.¹⁰ Furthermore, virus has been recovered from the stools of human patients (work summarized by Kramer¹⁰). It has been shown experimentally by Levaditi and others¹¹ that virus which has been fed may be recovered from the stools. The recovery of virus from the stools with the naturally occurring disease has been attributed to the swallowing of virus-containing nasal secretions. This is generally considered as further evidence that localization on the olfactory mucosa is a stage in the pathogenesis of the natural disease.

There is, however, much evidence which does not harmonize with the idea of the nasal route as the pathway of entrance. Haber¹² showed that section of the olfactory bulbs did not always prevent infection after intranasal instillation, and others¹³ have demonstrated that the nasal pathway is not the only mode of entrance of the virus into the nervous system after intravenous injection.

Most of the experimental work has been carried out with strains of virus that had undergone repeated animal passage. Recently isolated strains may behave quite

differently. Trask and Paul¹⁴ have convincingly shown that strains of virus freshly isolated may be highly infectious by cutaneous inoculation, although this property tends to diminish or to be lost with repeated monkey passage. The long-passaged strains used to demonstrate the significance of the nasal pathway, for example the Rockefeller MV strain,¹⁵ are relatively harmless on cutaneous inoculation.

Another example of change in properties with passage is furnished by Kling and his co-workers.¹⁶ Simple feeding at first resulted in a high percentage of infection. But with repeated passage over a period of years the percentage of infection by this route sharply diminished. With the strains used by German and Trask,¹³ infection was not due to deposition of virus from the blood on the olfactory mucosa, with subsequent passage along the olfactory nerve. Bilateral olfactory neurectomy did not prevent experimental poliomyelitis after intravenous or intracutaneous inoculation. Infection even resulted from inoculation into completely denervated areas in which the blood supply was intact.

In the natural disease there is independent evidence against the significance of the nasal route. The epidemiology is one important aspect. The incidence of poliomyelitis does not harmonize with the incidence of known respiratory infections. Further evidence is furnished by pathologic studies. Experimentally infection by the olfactory pathway gives rise to characteristic pathologic features in the olfactory bulb, recently considered by Sabin and Olitsky.¹³ With regard to the human disease there are only a few observations on the histologic state of the olfactory bulbs, but these are all negative. Smith¹⁷ found "surprisingly little" change in a series of fifty-six bulbs from forty patients. Harmon¹⁸ obtained similar negative results. Sabin (a personal communication) also studied bulbs from twelve human patients, and in no instance was there evidence of the passage of virus. However, he stated that clinically most of these patients gave a history of the bulbar type of the disease. The negative evidence weakens the case for the importance of the olfactory pathway in the natural disease, a conclusion already reached by Smith. Further studies on this subject are urgently needed.

A point of considerable interest is the recovery of virus from nasal washings and stools of human patients. Clearly these observations in naturally occurring cases indicate a mode of excretion of the virus. A problem of theoretical interest is thereby posed. In opposition to earlier work considering poliomyelitis as a systemic disease, more recent work¹⁹ has considered that virus as strictly neurotropic, that is, not multiplying except in nerve tissue. If this is correct, the problem thus arises: How does the virus get out of the nervous system?

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21. Smith, L. W., quoted by Sabin and Olitsky.¹³
22. Harmon, P. H., in discussion on Toomey, J. A.: Active and Passive Immunity and Portal of Entry in Poliomyelitis, *J. A. M. A.* **109**: 402-406 (Aug. 7) 1937.
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In the olfactory mucosa it is possible that virus-charged nerve cells in the epithelium in some way discharge the virus into the secretions, while the nonnervous portion of the epithelium plays no part. A little reflection shows that the quantity of virus so discharged must be enormous if, say, enough is going to persist unchanged through the intestinal tract and be recovered in the stools. Considering the enzymatic action and the p_H alterations encountered on such a voyage, and considering the lack of sensitivity of the test animal, the amount of virus produced must originally be very great. If the virus multiplies only in nerve cells, the problem of excretion by nerve cells into a fluid medium is raised. One of the principal objections to accepting this point of view is that in the cranial cavity, where nerve tissue has free access to the cerebrospinal fluid, the virus can be demonstrated in this fluid only with the utmost difficulty, if at all. Considering the relative number of nerve cells in the brain and the ease with which concentrated spinal fluid may be gathered, it does not seem likely that nerve cells exude virus into their fluid environment. The relatively few nerve cells in the olfactory mucosa (and the greater technical difficulty of collecting nasal secretions to demonstrate virus) make it seem unlikely that the virus in the olfactory mucosa is restricted to the neural elements. This problem also awaits further investigation. It seems to me that there is no natural disease which can be called strictly neurotropic and that poliomyelitis, to some extent at least, is a systemic disease. In this connection Brodie and Elvidge,³ while claiming that experimental poliomyelitis is entirely a central nervous system disease, held it not proved that the natural disease is equally so.

The work so far presented indicates that in experimental poliomyelitis special ease of infection by the olfactory route, together with the general importance of this portal of entry, is a property of certain strains of the virus. But with fresh strains the subcutaneous route may be highly effective, a property that is readily lost. Since the monkey is at best a poor host, the production of disease by moderate doses given intracutaneously appears of great significance. Of equal significance is the fact that cutaneous infectiveness is impaired by repeated passage. It is possible that the relative importance of the nasal route in experimental poliomyelitis is purely an artificial condition, brought about by some degree of change in the virus and without necessary relation to the natural disease. There are other diseases which furnish suggestive analogies and parallels on this point.

Recent work²⁰ with equine encephalomyelitis virus may be briefly summarized. Both fresh and fixed²¹ strains of virus were used, both highly virulent after intracerebral inoculation. But with peripheral inoculation the behavior is different.

In adult mice, with the fresh strain, any peripheral route of inoculation is effective. Injections into the peritoneum, subcutaneous tissue or eye and instillation into the nose result in infection, with but little difference in virulence for any of these routes. On the other hand, fixed virus injected subcutaneously is nonpathogenic, although the same virus placed in the nares or

injected into the eye is active in high dilutions. Infection by the ocular or nasal route, while less effective than by the intracerebral pathway, is far more virulent than any other mode of peripheral inoculation. With the fresh, recently isolated strain this difference does not exist.

In guinea pigs,²² fixed virus injected into the eye could be traced with utter constancy along the appropriate nerve paths in the brain. When injected into the eye, the fixed virus first infects the ganglion cells of the retina. Once the cell body has become involved, the virus, in a manner yet unclear, passes along the axons constituting the optic nerve.

The anatomic considerations of the olfactory system provide a similar explanation of the effectiveness of intranasal instillation of virus. The cells of origin of the olfactory nerve are located directly in the olfactory mucosa, so that virus applied to the mucosa infects the cell body first. The axon, the prolongation of the cell body, becomes secondarily involved.

Primary infection of the axon with subsequent involvement of the cell body rarely occurs. Injection of fixed virus directly into the sciatic nerve produces infection infrequently, even with high concentrations of virus.²⁰

With fixed virus, the heightened susceptibility to intranasal as compared with, say, subcutaneous inoculation is due to several factors. One is that this strain of virus, to infect the nervous system with any but enormous doses, must first involve the cell bodies of the neurons; the second, that in the nose the cell bodies are superficial in the olfactory mucosa, with corresponding ease of infection. Similar considerations apply to intra-ocular injections. Nerve filaments or endings, such as are encountered with subcutaneous injections, are not the equivalent of nerve cell bodies.

Ease of infection by the nasal route, in the face of relative refractoriness of other peripheral sites, is found with other viruses. The neurotropic strain of yellow fever virus, produced by passage of the natural virus through mice, behaves similarly. Adult mice, demonstrated by Theiler²³ to be refractory to intraperitoneal inoculation, will succumb only if there is simultaneous brain injury.²⁴ Recently, however, Findlay and Clarke²⁵ showed that intranasal instillation of virus without brain injury is readily followed by encephalitis. Louping ill has been shown by Webster and Fite²⁶ to be infectious for mice when given intranasally, but subcutaneous or intravenous inoculation is without pathologic effect.²⁷ In the intact mouse the virus of St. Louis encephalitis infects only with difficulty after intraperitoneal inoculation but readily by the nasal route.²⁸

When, however, the natural diseases are studied, the direct nasal portal of entry is of no apparent significance. Louping ill in nature is transmitted by the tick

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Ixodes ricinus.²⁰ Equine encephalomyelitis, with overwhelming probability, is carried by mosquitoes.³⁰ Yellow fever in nature does not produce encephalitis, but the usual viscerotropic virus may be neurotropic for mice,³³ and for monkeys the virus has been shown to harbor a neurotropic component that can be disclosed by a suitable experimental method.³¹ Yellow fever, of course, is also insect borne. The mode of transmission of the St. Louis encephalitis B is not known; mosquitoes may be artificially infected but have not been shown to transmit the disease by biting.³² But the Japanese encephalitis B, which, though serologically distinct from the St. Louis type, has many points of similarity, has been shown susceptible of transmission by mosquitoes.³³ These few examples suffice to show that certain viruses which in their natural condition are highly infectious by subcutaneous inoculation may with altered conditions show a predilection for the olfactory pathway.

It is of interest that in fox encephalitis, which was studied in its natural host, strong evidence has been adduced by Green and his associates³⁴ that the nose, or at least the respiratory tract, may be the natural portal of entry for the virus. This evidence only shows, however, how the virus may gain access to the body. The modes by which it then reaches the brain have not yet been demonstrated.

Experimentally, under conditions not yet understood, the olfactory neurons may at times furnish an indirect mode of entrance into the nervous system. But at present there is little evidence that in naturally occurring virus diseases of the nervous system the nose is the direct portal of entry from which viruses pass into the brain. Under the conditions of experimentation this pathway has received great prominence, but the necessarily artificial character of the data must be kept in mind.

THE HEMATO-ENCEPHALIC BARRIER

There are relationships discernible between the action of certain viruses and that of certain vital dyes. With the acid dyes, such as trypan blue, it has been abundantly shown that the adult brain does not stain vitally under normal conditions. But brain trauma allows the dye to penetrate the injured tissue. Furthermore, in infant animals the dye will penetrate more easily into the brain than is the case with adults. This entire subject has been discussed at length elsewhere,³⁵ and certain exceptions to the statements just made have been noted.

There are striking parallels between these facts and the action of certain viruses. These may be considered under two headings:

The Facilitating Action of Brain Trauma.—Certain viruses are harmless if injected intraperitoneally into adult mice; but if at the same time there is a nonspecific brain injury, such as the injection into the brain of a weak starch solution, the intraperitoneal inoculation results in fatal encephalitis. This was shown for yellow fever virus by Sawyer and Lloyd.²⁴ A similar phenomenon occurs with the virus of St. Louis encephalitis.²⁸ Here, although the concentrated virus is lethal when given intraperitoneally, significant dilutions are fatal only after concomitant brain injury.

With other hosts and other viruses, comparable data are available. With poliomyelitis virus, Flexner and Amoss³⁶ first demonstrated the facilitating effect of meningeal irritation in producing infection after various routes of inoculation. Others³⁷ have shown that parenchymatous damage to brain tissue was similarly effective. German and Trask³⁸ found that peripheral injury, such as operations on the extremities, may facilitate infection. Here the central nervous system was not directly involved.

With Borna disease virus, Zwicky, Seifried and Witte³⁸ showed that cutaneous inoculation was regularly infective only after nonspecific brain trauma. Similarly, in rabies³⁹ there is a facilitating effect on peripheral inoculations if spinal fluid is pumped back and forth.

However, not all viruses show this behavior. Vesicular stomatitis and equine encephalomyelitis are highly infectious with direct intracerebral inoculation. Yet when injected peripherally their encephalitogenic power is not increased by concomitant brain injury.⁴⁰

Increased Susceptibility of the Infant Organism.—With certain viruses infant animals, especially mice, are much more susceptible to peripheral inoculation than are adults of the same species. This was first shown by Theiler²³ for the virus of yellow fever and by Andervont⁴¹ for certain strains of herpes virus. More recently the phenomenon has been studied by Olitsky and his associates⁴² with vesicular stomatitis viruses, in which the disparity between infants and adults was marked with the particular strains employed. Equine encephalomyelitis virus has also been studied from this standpoint.⁴³

That injury facilitates the passage of virus and of trypan blue into the brain, and that the infant brain

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41. Andervont, H. B.: Activity of Herpetiv Virus in Mice, J. Infect. Dis. 44: 383-393 (May) 1929.

42. Olitsky, P. K.; Sabin, A. B., and Cox, H. R.: An Acquired Resistance of Growing Animals to Certain Neurotropic Viruses in the Absence of Humoral Antibodies or Previous Exposure to Infection. J. Exper. Med. 64: 723-737 (Nov.) 1936. Sabin, A. B., and Olitsky, P. K.: Influence of Host Factors on Neuro-Invasiveness of Vesicular Stomatitis Virus: I. Effect of Age on the Invasion of the Brain by Virus Instilled in the Nose, *ibid.* 66: 15-34 (July) 1937; II. Effect of Age on the Invasion of the Peripheral and Central Nervous Systems by Virus Injected into the Leg Muscle or the Eye, *ibid.* 66: 35-57 (July) 1937.

43. Sabin, A. B., and Olitsky, P. K.: Age of Host and Capacity of Equine Encephalomyelitis Viruses to Invade the CNS, Proc. Soc. Exper. Biol. & Med. 38: 597-599 (May) 1938. King.²⁹

is more receptive to some viruses and to trypan blue than is the adult organ, are rather surprising parallels, which may be merely unrelated coincidence or may suggest some deeper uniformity.

The reasons why a cerebral trauma facilitates infection after peripheral inoculation are not at all clear. The simple explanation of a "barrier" which has been broken down, as if a hole had been knocked in a fence, seems scarcely tenable. If such a rupture in the "barrier" were correct, one would expect that brain trauma, with peripheral injection, such as by the intravenous route, would allow any virus to pass in readily, making a situation comparable to intracerebral injection of virus. With some viruses this does not occur. The situation is undoubtedly much more complicated.

With vital dyes, the most satisfactory explanation for staining of an injured area is a change in the binding power, or "affinity," of the tissue toward the dye.³⁵ It seems likely that a comparable explanation may apply in the case of certain virus infections. As a substrate for virus activity, tissue which has been altered by injury presents different properties from normal tissue. Virus in contact with this altered tissue may behave differently from virus in contact with normal healthy tissue. But experimental work is necessary to establish the validity of this speculation.

With respect to the special behavior of infant animals, especially mice, toward some viruses, differences in the tissue must also be kept in mind. From the anatomic and biochemical standpoint the immature nervous system of infant animals of most species is distinctly different from the adult stages. The role of these factors for vital staining has been emphasized elsewhere.³⁵ The intrinsic differences between immature and mature nerve tissue may constitute the alterations in substrate required to explain the variation in behavior of infant and adult animals toward some viruses.

Although this subject is clearly in need of detailed study, one fact stands out, namely, that some change in the character of nerve tissue is the one connecting link between (a) the increased susceptibility of infants as compared with adults and (b) the increased susceptibility of injured as compared with normal animals. The changes in the two instances are obviously not the same. It is possible that there is nothing in common between the two sets of phenomena or between the action of some viruses and that of certain vital dyes; but the parallelism between virus and dye action exists and should be pointed out. Only future work can determine the significance of this parallel.

CONSIDERATIONS ON HISTOPATHOLOGY

There are three cardinal points in the pathology of virus diseases of the nervous system: inclusion bodies, cellular necrosis and inflammation. These three need not all be present. In pseudorabies in the rabbit, for example, inclusion bodies may be the only sign of disease, and inflammation as well as frank necrosis may be absent. Furthermore, none of these features are in any sense specific for virus diseases. Nevertheless they furnish a constantly recurring pattern which must be explained.

Viruses are generally considered as obligatory intracellular parasites. The question has been raised whether neurotropic viruses primarily attack the nerve cells. Many viruses have been shown to travel along nerve paths. Injury to the cells harboring the virus might logically be expected as the first step. In some cases,

under experimental conditions, nerve cell damage has been shown to precede any inflammatory change. This damage may take the form of inclusion bodies as, for example, in poliomyelitis,⁴⁴ where changes in anterior horn nerve cells may precede any inflammation; or there may be extensive loss of neurons without significant reaction, such as occurs in the cerebellum in louping ill.⁴⁵ The whole subject has been well reviewed by Hurst.⁴⁶

There are observations, however, which do not harmonize with the view of primary attack on neurons. In experimental St. Louis encephalitis²⁸ and equine encephalomyelitis⁴⁷ the first alterations are clearly inflammatory and interstitial. This is of special interest in equine encephalomyelitis, for this virus may invade the brain directly through the blood stream but may also travel along nerve paths.⁴⁸ It may attack the tissue after axonal transmission or attack through the blood vessel wall, but in either case it provokes an interstitial reaction as the first response.

With reference to the cell damage found in virus encephalitis, it is important to remember that selective neuronal necrosis occurs in nonvirus diseases such as various circulatory and toxic disturbances. The most familiar examples include the selective loss of pyramidal cells in the hippocampus, the granule cells of the fascia dentata remaining intact; the selective destruction of Purkinje cells in the cerebellum, and the scattered areas of neuronal loss, or "verödungsherden," in the cerebral cortex. To this type of damage inflammatory response may be absent or insignificant. The occasional inflammatory cells that are inconstantly seen in such reactions are considered by neuropathologists as "secondary" inflammation, in the sense of a reaction to necrotic tissue however produced. In marked contrast to this is the vigorous inflammatory change seen in various forms of encephalitis, even where there is no necrosis of tissue.

When forms of virus encephalitis are compared with other forms of pathologic alteration of the brain, it is clear that cellular necrosis and inflammation may vary quite independently of each other. Either one may occur with little or no indication of the other. As a class, the virus encephalitis are primary inflammatory conditions. The degree of neuronal damage is totally inadequate to account for the mesodermal response on the basis of a nonspecific reaction to injury however produced. The distinction between a secondary inflammation clearly dependent on extensive necrosis and a primary inflammation which may be quite independent of necrosis is valid.

It might be suggested that in virus encephalitis there are both inflammatory and necrotizing components. It would be misleading to call either one primary and the other secondary. Although, of course, sufficient inflammation however produced will invariably

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46. Hurst, E. W.: The Newer Knowledge of Virus Diseases of the Nervous System: A Review and an Interpretation, *Brain* 50: 1-13 (March) 1936.

47. King, L. S.: Studies on Eastern Equine Encephalomyelitis. I. Histopathology of the Nervous System in the Guinea Pig, *J. Exper. Med.* 68: 677-692 (Nov.) 1938.

48. King, L. S.: Studies on Eastern Equine Encephalomyelitis. II. Pathogenesis of the Disease in the Guinea Pig, *J. Exper. Med.* 69: 67-690 (May) 1939.

injure cells, while extensive necrosis from whatever cause may provoke a slight inflammatory reaction, nevertheless these two components have no necessary connection with each other. In some diseases and in some hosts one type may prevail; in another host the same virus may provoke an entirely different response. This is well illustrated in louping ill, with which, according to Brownlee and Wilson,⁴⁹ the pig shows an intense inflammation with insignificant cellular necrosis, while in other hosts abundant necrosis is present. The difference in behavior can only be ascribed to host factors. These two components must be considered as correlative in their action, one predominating under certain conditions, the other under different circumstances.

In relation to the neuronal changes found in many virus diseases, the reaction produced by a nontransmissible nonviral agent is of considerable significance. This agent, present in monkey bone marrow as well as in other tissues of other animals, is widely known as a result of the Gordon⁵⁰ test for Hodgkin's disease. On injection into guinea pigs or rabbits it causes a characteristic encephalopathy.⁵¹ The principal and invariable feature is a selective loss of Purkinje cells of the cerebellum. In the early stages cells show well marked intranuclear acidophilic inclusion bodies, indistinguishable from those described for poliomyelitis or equine encephalomyelitis. At a slightly later stage ectodermal glial nuclei also show acidophilic inclusion bodies. A change less constant than Purkinje cell loss is a symmetrical necrosis of the pyramidal cells of the hippocampus, again with absent or insignificant inflammatory changes. It is of interest, then, that a nonviral agent can cause selective necrosis of nerve cells, with formation of inclusion bodies as a stage in the process, by action that appears to be indirect.

Comparison may be made with certain virus diseases. Hurst⁴⁶ commented on the frequency with which hippocampal necrosis occurs in rodents in a variety of diseases. Selective loss of Purkinje cells is pronounced in louping ill⁴⁵ and somewhat less marked in many other diseases. The similarities between some virus diseases and the encephalopathy from bone marrow extract are striking.

Although it is not known how viruses act on the brain, a tentative separation into direct and indirect action seems plausible. By direct action is meant the immediate interaction between virus and tissue. The nature of this reaction varies according to the animal host. With equine encephalomyelitis virus in the guinea pig, for instance, the direct action would be exemplified by disseminated focal lesions, in which inflammatory changes appear first with more or less cell necrosis later.

By indirect action is meant the initiation of a train of events leading primarily to cell necrosis, effected by means shared by nonvirus agents. The type of massive hippocampal necrosis, for example, found after intracerebral injection of equine encephalomyelitis is too similar to that produced by normal monkey bone marrow to be dismissed as a coincidence. An underlying common factor, not specific to either, must be assumed.

Similar considerations may apply to the sequence of intranuclear inclusions followed by neuronal necrosis, as shown, for example, by poliomyelitis and this same bone marrow agent, or to the phenomenon of selective Purkinje cell necrosis.

It would be premature to speculate on the underlying bases of such changes. It is worth noting, however, that in many virus encephalitis there occur disseminated areas of damage that may be called primary and other types of injury that may be called secondary and indirect. Such a distinction may not be valid for all viruses or for all susceptible hosts, but the possibility of such a distinction must be kept in mind in the study of any virus pathology.

CONCLUSION

The material of this paper does not lend itself to summary. From all the data here presented, the only conclusion that can satisfactorily be drawn is that but little is known of the interaction between viruses and the nervous system. As yet there is only fragmentary evidence. Only future work, with unremitting critical examination of data and doctrine, can lead to a sound basis of understanding.

ABSTRACT OF DISCUSSION

DR. ROBERT G. GREEN, Minneapolis: The problem of determining the mode of passage of the viruses into the central nervous system has been well considered by Dr. King. The reverse process also has a critical bearing on the subject. A virus, like any other biologic parasite, after reproduction must escape to a new host to perpetuate its species. It may be that many viruses which produce disease of the central nervous system grow sufficiently for species perpetuation in some surface area such as the upper part of the respiratory tract and that invasion of the central nervous system is entirely accidental. Regardless of whether or not a virus must escape from the central nervous system, a demonstration of its actual passage to the exterior and of the manner in which it progresses must be valuable in the solution of this problem. From a closed intramuscular or intracranial injection, the virus of fox encephalitis soon appears in the nasal cavity. Since the virus is found in the blood stream and since it does not attack nerve tissue, the virus must be blood borne to the nasal location. The complexity of the hemato-encephalic barrier is clearly shown in the special case of the fox encephalitis virus. In the natural disease this virus is distributed throughout the brain but only in association with endothelial cells. It never penetrates sufficiently to involve the ependymal cells lining the cerebrospinal circulatory system. If the virus is introduced into the cerebrospinal fluid, it at once attacks the ependymal cells. It may be that the early inflammatory reaction of viruses discussed by Dr. King is, as he suggested, an extracellular effect of viruses; or the early growth of the virus in the cell may produce disturbances in the cell metabolites which call forth an inflammatory response. In my experience the same virus may produce cell destruction with no inflammatory response in some animals and in other individuals of the same species may provoke an intense inflammatory response with few cells showing any specific effect of the virus. However, as viruses seem to be incomplete microbes, some of those less highly adapted and simplified might be considered to carry on their parasitic processes between cells in close proximity to the cell membrane rather than within the host cell protoplasm.

DR. RICHARD B. RICHTER, Chicago: I am gratified at the remarks about the significance of the olfactory pathway. In this country, at least, the experimental evidence that suggested the olfactory pathway to be the significant one in natural disease has been emphasized at the expense of the evidence against it, especially for poliomyelitis. I think Dr. King's conclusion that this route is unimportant in the natural disease is valid for the group of diseases which he is considering, particularly polio-

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50. Gordon, M. H.: Remarks on Hodgkin's Disease, *Brit. M. J.* 1: 641-644 (April 15) 1933.

51. Kelser, R. A., and King, L. S.: Studies of a Paralysis Syndrome Produced in Rabbits and Guinea Pigs by Extracts of Normal Primate Bone Marrow, *Am. J. Path.* 12: 317-352 (May) 1936. King, L. S.: Encephalopathy Following Injections of Bone Marrow Extract, *J. Exper. Med.* 70: 303-314 (Sept.) 1939.

myelitis, St. Louis encephalitis and equine encephalomyelitis. These are diseases which have similar epidemiologic manifestations, which are seasonal in late summer and in which there is virtually no evidence of any contact communicability. But the possibility of natural infection by way of this pathway may be of great significance for other types of encephalitis, notably for lethargic encephalitis, a disease attacking by preference in the winter months and notoriously associated with respiratory infections. There is some reason to believe that here direct contact infection occurs. The speculation which Dr. King has made about the hemato-encephalic barrier is interesting. When Nissl first introduced this conception his idea was that the barrier was represented anatomically by the adventitia of the cerebral blood vessels and it is now spoken of as a brain-blood barrier and the idea has been gradually formed that it is sort of a mechanical wall. Undoubtedly the situation is more complicated than this, but I do think that there are some considerations which point to the pial-glial apparatus of the brain as being a true biologic barrier and the site of much of the defense of the brain against toxins and infectious agents. I cite the older experimental results of injecting micro-organisms into the blood stream with and without concomitant trauma to brain or cerebral vessels. Without such trauma there is relatively little involvement of the brain. With it there is much and the infectious process becomes precisely localized at the point of injury to the tissue. Dr. King's suggestions as to the nature of damage to nerve cells from viruses is also of great interest. In the light of such clear-cut experiments as those of Goodpasture, for example, on the transmission of herpes and rabies virus along axons with direct involvement of the nerve cells, it is hard for me to give up the idea that such direct action is the most important feature.

DR. L. S. KING, Princeton, N. J.: I am glad that Dr. Green raised the point of the invasion of the central nervous system as merely an incidental factor in infections. Poliomyelitis has been given as an example of a purely neurotropic disease which invades only the nervous system. I feel that Dr. Green does not agree with this, and I do not agree with it. In all probability there is no such thing as a purely neurotropic virus; all encephalitis are systemic diseases, and the invasion of the nervous system is more of an incidental factor which may occur in some cases and may not occur in others. The reason the central nervous system is involved in some persons and not in others is as yet unknown. I am glad that Dr. Green does not believe viruses are necessarily intracellular parasites. Viruses can multiply only in the presence of living cells, but that is different from saying that viruses can multiply only in living cells. I feel that probably viruses are not necessarily intracellular parasites. They can multiply only in the presence of living cells, but multiplication may, of course, be extracellular. Dr. Richter raised the point of von Economo's encephalitis. The point he has raised is a valid one, but this virus is lost, and there is no way of carrying on experimental studies. The hemato-encephalic barrier probably has a locus in the sense of an interface. The capillary endothelium marks the interface between the blood and the brain tissue. But that is quite a bit different from saying that the barrier consists of the capillary endothelium, which is the point against which I wish to protest. The barrier, in my mind, lies in an interaction between three substances: the blood, the membrane (that is, the capillary endothelium) and the brain. Obviously the membrane, the capillary, is the division between the two systems. Although that is the site, it is not the barrier in the sense of a structure which of itself keeps things out. Concerning the transmission of virus along the nervous system, demonstrated in the experiments of Goodpasture and others, the property of living only inside nerve tissue is frequently a property only of a fixed virus. Viruses which primarily travel up nerves are those which, by modification, can multiply only inside of nerve tissue. Some viruses will multiply in many kinds of tissue. Under certain altered conditions, such viruses retain the faculty of multiplying only in nerve tissue and have lost the power of affecting other tissues. The strains of herpes virus which travel up nerves seem to be precisely those strains which have lost the faculty of multiplying in non-nervous tissue and multiply only within the nerve tissue.

MAPHARSEN IN TREATMENT OF SYPHILIS IN OFFICE PRACTICE

A STUDY BASED ON 2,342 INJECTIONS OF
113 PATIENTS

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Our purpose in this paper is to discuss the value of mapharsen in the treatment of syphilis by the physician in his private practice.

It is known that the majority of syphilitic patients undergoing treatment in private practice are in the late asymptomatic stage and that the diagnosis of syphilis is frequently made solely on serologic evidence.

Now that most states have, or soon will have, legislation requiring routine premarital and antepartum blood tests, many more latent asymptomatic syphilitic persons will be detected and will undergo treatment in clinics or in private practice. It has been estimated that between 50 and 90 per cent of syphilitic patients treated in private practice are asymptomatic. It is especially with regard to this large group that the determination of the diagnosis rests, in large measure, on the outcome of the serologic examination.

One of the great difficulties encountered in private practice is to convince patients with latent syphilis that sustained treatment must be carried out. Aside from economic considerations, one of the most important reasons for irregular and haphazard attendance and eventually for complete relinquishment of treatment is the production of various untoward reactions by the standard arsenical preparations in common use. Such reactions—often alarming and at times dangerous—in patients who before therapy had no symptoms relative to their infection play an important role in discouraging them from continuing the necessary treatment.

It is therefore an indispensable part of treatment to avoid the therapeutic reactions which so often are stumbling blocks in the path of an otherwise uneventful series of injections and handicap the practitioner in the free use of the arsenicals. If, for these asymptomatic patients, a preparation that produced a minimum of untoward reactions was used, it would be an added inducement toward faithful adherence of the patient to the prescribed courses of therapy.

Such a preparation is available in the form of meta-amino-parahydroxyphenylarsine oxide hydrochloride, a trivalent arsenical identical with arsenoxide and designated by Tatum and Cooper¹ as mapharsen. This preparation has been thoroughly investigated and many reports have been published to attest its effectiveness in producing early sterilization and disappearance of spirochetes in open primary lesions, with rapid healing of concomitant and later clinical manifestations, and in

The mapharsen used in this study was supplied by Parke, Davis & Co., Detroit.

Dr. Girsch Astrachan and Dr. Samuel B. Frank furnished some of the material used in this study.

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effecting and maintaining a reversal of serologic reactions within a reasonable length of time.²

We were especially interested in reports pertaining to the relatively low toxicity of therapeutic doses, the absence of severe nitritoid reactions, and freedom from reactions, except those affecting the gastrointestinal tract. Moreover, up to the present time no fatalities have been encountered which resulted from therapy with mapharsen.³

CLINICAL MATERIAL

This report embraces observations of all patients who received mapharsen over a period of thirty-four months. A total of 113 patients received 2,342 intravenous injections, with an average of 20.7 injections per patient. This series consisted of sixty-five males and forty-eight females. Their ages ranged from 13 to 70 years, with an average age of 37.7 years.

The initial dose was 20 mg., and this was increased to 40 mg. for females and 60 mg. for males. (Some of the heavier females received as much as 60 mg., while some of the slighter males were maintained at a 40 mg. dosage.)

Of these 113 patients, eighteen (15.9 per cent) applied for treatment because they had clinical evidences of syphilis, manifested individually as chancres, secondary eruptions or gummas. Twenty-three patients (20.3 per cent) consulted their physicians for a serologic recheck because they knew they had, or had had, syphilis and wanted to determine their present serologic status. Of these twenty-three patients, the condition of approximately 50 per cent was originally diagnosed as syphilitic by routine blood tests. For the remaining seventy-two patients (63.7 per cent) the diagnosis of syphilis was made solely by routine serologic examinations. When these patients were carefully questioned regarding their infections, eighteen admitted knowledge of a previous infection and treatment. The remaining fifty-four patients stated that they never knew they had the disease.

In this group of 113 patients, eighty-three were asymptomatic. Eighteen patients presented clinical evidence of cutaneous syphilis, and five instances of cardiovascular syphilis were detected by electrocardiographic studies, while spinal fluid examinations disclosed that seven patients had asymptomatic syphilis of the central nervous system.

THE THERAPEUTIC EFFICACY OF MAPHARSEN

Owing to the fact that most of the patients treated in this series were in the latent or asymptomatic stage (that is, they had no symptoms referable to their dis-

ease), we had to depend on the serologic observations to determine the efficacy of the drug. Blood tests were made on all patients before the institution of mapharsen therapy. Twenty-four patients (21.2 per cent) discontinued treatment before we were able to recheck the blood tests. In sixty-five cases (57.5 per cent) there was complete or partial reversal of the serologic reactions. In twenty-four cases (21.2 per cent) the serologic reactions remained unchanged.

The Kline diagnostic and exclusion tests and two cholesterinized Wassermann tests were made on all patients. When the Kline reactions were strongly positive (4 plus) the blood specimens were diluted in order to determine the reagin titer, and the results were recorded in units of reagin. Some specimens had a titer of more than 400 units; after a series of mapharsen injections the titer was reduced to 20 units. If the samples of blood had not been recorded, those taken at both times would have been recorded as 4 plus, but according to the titration method there was an evident marked response to therapy.

The therapeutic effect of mapharsen on the cutaneous manifestations of syphilis was striking. In the primary lesions there was rapid sterilization and healing. The patients with active secondary manifestations showed early disappearance of the lesions. Those with gummatous lesions of the skin showed a similar rapid healing.

TABLE 1.—Effect of Mapharsen Therapy on the Serologic Reactions

Serologic Reaction	Number of Cases	Percentage of Cases
Became and remained negative.....	19	16.8
Improved.....	46	40.7
Not improved.....	24	21.2
Test not repeated.....	24	21.2
Total.....	113	

Many patients with cardiovascular and central nervous system syphilis, who had symptoms referable to the affected organs, volunteered the information that a marked improvement or disappearance of disturbing symptoms occurred soon after therapy was begun. Although such subjective symptoms are relatively of little significance, it is nevertheless noteworthy that many patients remarked that they "felt better," "improved in appetite," "gained weight," "slept better," or progressed in other ways.

The prompt healing of cutaneous lesions, the complete or partial reversal of serologic reactions and the improvement of subjective symptoms following mapharsen therapy compare favorably with the response to arsphenamine and neoarsphenamine therapy.

In this series the majority of patients received alternating courses of mapharsen and of bismuth compounds consisting of twelve injections each per course. Others received treatment by the concurrent method—that is, mapharsen each of a bismuth compound and of mapharsen alone—that is, a few were treated with heavy metal.

The clinical and serologic response to mapharsen therapy was much more favorable in patients who were treated by the concurrent method, i. e., a combination of mapharsen and a bismuth compound. An experiment in which we attempted to assess the effect of mapharsen alone in a single patient proved disappointing.

A man aged 37 developed a penile chancre three weeks after exposure. Serologic reactions were doubtful with Wassermann and Kline diagnostic and exclusion tests at the first examina-

2. The investigators include:
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Forster and others.⁴
3. Cole, H. N.: The Use of Antisyphilitic Remedies, J. A. M. A. 107: 2123 (Dec. 26) 1936.
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Traenkle, H. L.: Reactions to Mapharsen, with Special Reference to Its Use in Patients Who React to the Arsphenamines, Arch. Dermat. & Syph. 36: 1158 (Dec.) 1937.
Appel, Bernard: Mapharsen in the Treatment of Cardiovascular Syphilis, New England J. Med. 217: 992 (Dec.) 1937.

tion, but all tests became strongly positive in forty-eight hours. He received intravenous injections of mapharsen daily for sixteen days. The dosage varied from 0.03 to 0.06 Gm. with a total of 0.88 Gm. (0.055 Gm. per injection). Regression of the chancre was very slow and the reduction of the serologic titer was equally retarded. At this juncture, the patient received five intramuscular injections of a bismuth compound and four additional mapharsen injections. Even after the first injection of bismuth a noticeable regression of the chancre was apparent. At the termination of this concurrent series of mapharsen and bismuth injections the chancre had healed completely and Kline diagnostic and Wassermann tests were negative.

This isolated experiment, meager as it is in significance, suggests two things: first, that mapharsen is relatively nontoxic and may even be given daily without producing serious untoward reactions; second, that despite daily administrations of conventional doses, when unsupported by a heavy metal it was not effective.

For two women with secondary syphilis, two methods of treatment illustrating the efficacy of combined therapy were employed. The first patient received three injections a week of mapharsen for a total of thirty-nine injections, with an aggregate dosage of 1.44 Gm. (0.037 Gm. per injection). During this period she received only two intramuscular injections of bismuth. Although the cutaneous eruption disappeared within the first two weeks, the blood tests were still positive at the end of this course. She then received four weekly injections of bismuth, at the end of which there was a marked reduction of the reagin titer. After this she received additional treatment of thirty-one mapharsen injections (1.43 Gm., or 0.046 Gm. per injection) and eight intramuscular bismuth injections, at the end of which all the blood tests were negative, as they have remained to the time of the last examination, i. e., for an interval of sixteen months. Cardiovascular and spinal fluid examinations also were negative. This patient with secondary syphilis therefore required a total of seventy-one injections of mapharsen (2.85 Gm. of mapharsen) and fourteen intramuscular injections of bismuth to produce and maintain a complete serologic reversal.

The second patient with secondary syphilis received one intravenous injection of mapharsen and one intramuscular injection of bismuth concurrently once a week. She received sixteen injections of mapharsen (0.58 Gm., or 0.036 Gm. per injection). At the end of the twelfth injection all tests were completely negative, as they have remained for the past twenty-eight months.

Two men with primary lesions also were compared. The first, aged 29, had a chancre on the chin and positive blood tests. He received three injections of mapharsen and one intramuscular injection of a bismuth compound each week, for a total of twenty-eight injections of mapharsen (1.51 Gm., or 0.054 Gm. per injection). At the end of three weeks the primary lesion was completely healed, but at the conclusion of twenty-eight injections he developed an arsenical eruption simulating pityriasis rosea. Mapharsen was stopped temporarily. On resumption of mapharsen the dermatitis recurred. He then was given eighteen additional weekly injections of bismuth, at the conclusion of which all tests were completely negative; they have remained so to the present time (twenty-one months). The spinal fluid and cardiovascular examinations were also negative.

The other patient, aged 34, presented a penile lesion with a positive dark field examination and positive blood tests. He received three injections of mapharsen on three successive days and then concurrent injections

of mapharsen and bismuth, one of each once a week, for a total of seventeen injections of mapharsen (0.9 Gm., or 0.053 Gm. per injection) and fifteen injections of a bismuth compound. All the blood tests became negative after the fourteenth injection of mapharsen and have remained negative ever since (twenty-three months).

These five cases, although inadequate to permit definite conclusions, at least suggest that:

1. Mapharsen is relatively nontoxic and may be given daily without producing serious untoward reactions.

2. Mapharsen alone in such frequent administrations may produce rapid healing and disappearance of early cutaneous syphilis but does not produce an early serologic reversal.

3. Mapharsen used concurrently with a heavy metal (bismuth) not only produces more rapid healing of early cutaneous lesions but also effects and maintains an early complete reversal of the serologic reactions.

We feel that the more frequent administration of mapharsen (from three to seven injections a week), although well tolerated by patients with normal renal, cardiac and hepatic functions, does not add to the efficacy of treatments as manifested by more rapid sterilization and healing of early cutaneous lesions or by producing and maintaining an early complete serologic reversal.

Massive initial doses of mapharsen did not increase the effectiveness of treatment in early syphilis, a fact already noted by Foerster and his collaborators.⁴

UNTOWARD REACTIONS

The majority of investigators draw attention to the fact that mapharsen is relatively less toxic than the commonly used arsenicals and stress the point that there has not been a single report of hemorrhagic encephalitis or of death attributed to the use of mapharsen. The toxic effects of mapharsen are commonly classified as immediate or delayed reactions. The former group consists of (1) venous spasm, (2) mild gastrointestinal disturbances associated with nausea, vomiting and abdominal pain, (3) headache, (4) weakness or collapse and nitritoid reactions. The delayed reactions include such conditions as (1) nausea and vomiting, (2) fever and chills, (3) dizziness and fainting (4) precordial pain, (5) blood dyscrasias, (6) hemorrhagic encephalitis, (7) urticaria, (8) herpes (simplex and zoster), (9) dermatitis, (10) fixed eruptions, (11) plaquelike eruptions, (12) crustaceous lesions, (13) jaundice, (14) delayed nitritoid reactions, (15) exacerbations of preexisting eruptions, (16) ninth day erythema of Milian, (17) ocular disturbances, (18) renal damage and (19) neuritis.

Venous Spasm.—Early in our experience with mapharsen we noticed that several patients developed pain along the course of a vein due to venous spasm. This occurred during or immediately after the injection, especially if it was administered slowly. Sometimes these pains would extend as high as the shoulder; they would persist from a few minutes to twenty-four hours. When the drug was administered more rapidly, this reaction was eliminated almost entirely. Schoch⁵ has shown that the application of cold wet compresses over the vein is rapidly effective. Perivascular infiltration and extravascular seepage of small amounts of

4. Foerster, O. H.; McIntosh, R. L.; Wieder, L. M.; Foerster, H. R. and Cooper, G. A.: Mapharsen in the Treatment of Syphilis, *Arch. Dermat. & Syph.* 32: 868 (Dec.) 1935.
5. Schoch, A. G.: Treatment of Venous Spasm Resulting from Injection of Mapharsen or Arsphenamine, *Arch. Dermat. & Syph.* 31: 131 (Dec.) 1936.

mapharsen occurred in a few cases. This was associated with a burning pain and followed by a slight local inflammatory reaction but never resulted in local necrosis or sloughing.

Herxheimer Reactions.—Cole and Palmer⁶ reported that the Herxheimer reaction following the use of mapharsen was to be guarded against. They stated that with an initial dose of 30 to 40 mg. this reaction was frequently severe and advised that, in cases in which vital organs are affected by syphilis, extreme caution and a conservative initial dose should be employed. In our experience reactions of this type due to mapharsen were of mild and transitory character. Two patients with secondary syphilis had an exacerbation of the eruption accompanied by a slight elevation of temperature. The initial dose of mapharsen in all our cases was never more than 20 mg. Foerster and Herxheimer⁴ observed similar mild and transitory reactions in their series.

Nitritoid Reactions.—Most clinicians⁷ stress the complete absence of true nitritoid reactions. Swartz⁸ mentioned one specific case and Cole and Palmer⁶ observed four instances of a vascular crisis or a reaction of some sort which closely resembled the nitritoid reaction. In our series we did not encounter a single instance which could be classified as a true nitritoid reaction.

"Ninth Day Erythema."—Milian has called attention to a morbilliform or scarlatiniform eruption which may appear on the ninth day after treatment is instituted. This eruption is self limited, disappearing within three to four days without an aftermath and in spite of continued arsenical treatment. One patient in this series had such an eruption from mapharsen. The following case history is of interest because it is the first recorded instance of ninth day erythema of Milian resulting from the administration of mapharsen:

A man aged 34, first seen on April 9, 1938, had a penile ulcer of twelve days' duration. He was sexually exposed thirty-six days before he noticed the primary sore. Examination revealed a pea-sized indurated ulcer at the urethral orifice and enlarged inguinal lymph nodes. Blood tests were positive. The following treatment was given:

April 11, mapharsen 0.02 Gm. and bismuth salicylate 1.5 cc.

April 13, mapharsen 0.04 Gm.

April 15, mapharsen 0.06 Gm.

April 18, mapharsen 0.06 Gm. and bismuth salicylate 1.5 cc.

April 20, a generalized morbilliform eruption developed, associated with a temperature of 101 F. (nine days after the first injection of mapharsen).

No treatment was given for the rash.

April 22, the eruption had almost completely disappeared. Mapharsen 0.02 Gm. was administered.

April 25, mapharsen 0.04 Gm. and bismuth salicylate 1.5 cc.

April 27, mapharsen 0.04 Gm.

April 29, mapharsen 0.06 Gm.

The patient continued to receive mapharsen and bismuth therapy without having any more untoward reactions. There was no recurrence of the eruption.

Jaundice.—Although jaundice as a complication of mapharsen therapy has been reported, it is not a com-

mon occurrence. Cole and Palmer⁶ reported two cases of jaundice for which mapharsen may have been wholly or partially responsible. In one case the condition was complicated by the presence of malaria; one injection of neoarsphenamine had been given. Foerster⁴ reported that jaundice developed in four cases in his series (5 per cent) after mapharsen therapy. Three patients had received mapharsen only; one had received arsphenamine, mercuric salicylate and bismuth subsalicylate during a period of twelve months and had no treatment during the six months prior to treatment with mapharsen. In our present study, one patient had jaundice after mapharsen therapy:

A man aged 30 had a penile chancre in 1929 and received irregular treatment consisting of seventy injections each of neoarsphenamine and a bismuth compound. From December 1937 to July 1938 he received twenty-four intramuscular injections of bismuth salicylate. On September 7 an initial injection of mapharsen 0.02 Gm. was administered. This was followed by injections of mapharsen at weekly intervals for a total of eight injections (0.35 Gm.). After the third and each subsequent injection some nausea developed, but not of sufficient severity to warrant discontinuance of mapharsen therapy. Eight days after the eighth injection the patient became quite ill. Examination showed mild jaundice associated with an

TABLE 2.—Hematologic Reports of the Patient with Fatal Aplastic Anemia

Date	2/11	2/14	2/17	2/18	2/21	2/23	2/25	3/6	3/10
Red blood cells	1.5	2.0	2.5	2.0	2.4	3.1	2.5	2.7	2.2
Hemoglobin, %	42	58	62	55	61	50	50	55	50
Color index	1.4	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.1
Platelets	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
White blood cells	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100
Polymorphonuclears, %	24	24	24	21	2	2	2	2	2
Segmented cells, %	72	72	72	79	96	96	96	96	96
Lymphocytes, %	4	4	4	0.5	2	2	2	2	2
Monocytes, %	..	..	..	..	..	..	..	..	..
Transitionals, %	..	..	..	..	..	..	..	..	..
Reticulocytes, %	..	..	..	..	..	..	..	..	..
Normoblasts	..	..	..	..	..	..	..	..	..

enlarged tender liver. All antisyphilitic treatment was discontinued and sodium thiosulfate therapy (intravenous and oral) was instituted. He made an uneventful recovery, and the jaundice had completely disappeared in eight weeks.

Aplastic Anemia.—In the numerous reports in the literature dealing with untoward reactions following mapharsen therapy there is not a single recorded instance of aplastic anemia or death which could be attributed to mapharsen. Cole and Palmer⁶ reported one case in which acute nephrosis developed with fatal termination. The patient was a chronic alcoholic addict who tolerated both mapharsen and bismuth therapy without apparent reaction. The pathologist believed it impossible to define the cause of nephrosis and thought it conjectural that the nephrosis was due to mapharsen. In our series one patient developed aplastic anemia which terminated fatally; this is the first recorded death probably due to mapharsen therapy:

A woman aged 30 was referred to us for antisyphilitic therapy. Routine blood tests were strongly positive for syphilis. Physical examination showed no clinical evidence of syphilis. The patient stated, however, that she had been exposed sexually to only one man during the past three years. This contact had positive blood tests and was receiving antisyphilitic therapy. Our patient received four intramuscular injections of an insoluble bismuth preparation at five day intervals, followed by thirteen injections of mapharsen and the same bismuth preparation, one of each once a week. The initial dose of mapharsen was 0.02 Gm. and the total dose 0.36 Gm. (average dose 0.028 Gm.). The patient ate some fish, after which she experienced marked nausea and vomiting. The fol-

6. Cole, H. N., and Palmer, R. B.: Mapharsen in the Treatment of Syphilis, *Arch. Dermat. & Syph.* 36: 561 (Sept.) 1937.
7. Wieder, L. M.: Foerster, O. H., and Foerster, H. R.: Mapharsen in the Treatment of Syphilis: Further Studies, *Arch. Dermat. & Syph.* 35: 402 (March) 1937.
8. Swartz, J.: In discussion on Wieder, Foerster and Foerster, *Arch. Dermat. & Syph.* 35: 599 (April) 1937.
9. D.: Mapharsen, *Canad. M. A. J.* 36: 172 (Feb.) 1937.
10. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
11. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
12. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
13. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
14. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
15. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
16. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
17. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
18. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
19. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.
20. G. D.: Mapharsen, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.

lowing morning she developed generalized giant urticaria. She remained nauseated for twenty-four hours after the fourth injection of mapharsen (0.06 Gm.). The fifth injection was reduced to 0.02 Gm. and was followed immediately by the ingestion of 5 drops of compound solution of iodine in a glass of water (in an attempt to prevent nausea). The patient experienced no nausea after the injection. When the dose of mapharsen was increased above 0.02 Gm. the injection was followed by nausea, regardless of whether or not the compound solution of iodine was administered. At no time was it felt that the nausea was of sufficient severity to warrant the discontinuance of mapharsen. Following this first course of treatment (thirteen injections of mapharsen and seventeen of a bismuth compound) there was a marked reduction of the serologic titer. The patient then received twelve more injections of bismuth at weekly intervals (the last given on Jan. 19, 1938). On January 26 she received an injection of mapharsen (0.02 Gm.), which was followed by slight nausea but no vomiting. One week later a second injection of mapharsen (0.02 Gm.) was given, followed again by nausea but no vomiting. When she returned the following week for her third injection

TABLE 3.—Results of Special Tests of the Patient with Fatal Aplastic Anemia

Test	Result
Fragility tests	Initial hemolysis 0.45% NaCl Complete hemolysis 0.20% NaCl
Bleeding time	4 minutes
Clotting time	5 minutes
Icteric index	5.5
Blood plasma	Albumin 4.28% Globulin 1.88% Fibrin 0.226%
Sedimentation rate	15 min., 10 min.; 60 min., 130 min.
Serology, Blood	Kahn ++ Wassermann strongly positive
Spinal fluid	Cells 3 Sugar 58 mg. Globulin not increased Colloidal gold, slight syphilitic curve Alcoholic Wassermann 4 plus Cholesterinized Wassermann 4 plus Kahn 4 plus
Blood chemistry	Normal
Friedman test	Negative
Cervical smear	Negative for gonococcus
Feces	Positive for occult blood

she was very pale and complained of marked weakness, dizziness and faintness. The hemoglobin determination on that day was 30 per cent.

Immediate hospitalization was advised but the patient did not enter the Metropolitan Hospital, Welfare Island,⁹ until forty-eight hours later (February 11), at which time she submitted the aforementioned history of antisyphilitic treatment. She stated that during the Christmas holidays of 1937 she had influenza which lasted for one week and that since that time she had never felt entirely well, always feeling tired and easily fatigued but with no other specific complaints. One month before she noted "black and blue" spots which appeared on different parts of the body without relation to trauma. She became progressively weaker, and several days before admission she became noticeably pale. Five days prior to admission her weakness became so profound that she was unable to carry on her occupation as a school teacher. She complained of a slight elevation of temperature and of nausea but not of vomiting. Her last menstrual period began on Dec. 15, 1937, lasting the usual length of time with the normal amount of flow. Her next period was due during the middle of January, at which time she had her usual premonitory signs but no bleeding. There was no history of rectal bleeding, hematemesis, sore mouth, burning tongue or difficulty in walking. Dyspnea on exertion had been present for weeks before admission, and there had been a loss of 5 pounds (2 Kg.) in weight.

The patient was well developed and well nourished. She showed profound pallor but did not appear acutely ill. Observations were negative with the following exceptions: The

blood pressure was 85 systolic, 60 diastolic; the lower extremities showed several purpuric areas, and the axillary lymph nodes on the left were slightly enlarged.

During the first two weeks in the hospital the patient improved, with multiple transfusions as the chief form of therapy. During her stay at the hospital she received nine transfusions, as follows: February 12 300 cc., February 14 300 cc., February 16 250 cc., February 18 250 cc., February 20 250 cc., March 3 300 cc., March 7 250 cc., March 10 250 cc., and March 11 125 cc. On February 13 several ecchymotic areas developed on the right leg. On February 16 menstruation began and lasted for four days with normal flow. On March 2, after two intramuscular injections of liver extract, an abscess of the buttock developed. The symptoms noted on admission reappeared (weakness, lassitude). On March 6 the temperature rose to 105.2 F. and from then on until death it persistently rose to about this level. On February 6 pain developed in the right lower quadrant of the abdomen and soon after in the left lower quadrant. The pain was accompanied by tenderness in these areas but there was no rigidity. A surgical consultant decided that the abdomen was not involved in a discernible disease process. On March 10 the patient developed difficulty in hearing and had blurring of vision. A spinal tap done at that time disclosed clear fluid under normal pressure. On March 11 the patient died.

Roentgenograms of the chest and abdomen were negative. Electrophoresis, blood cultures, agglutination tests and sputum and stool examinations were also negative.

Autopsy was performed on March 11. The anatomic diagnoses were as follows:

1. Aplastic anemia due to arsenic treatment for syphilis.
2. Multiple petechial and ecchymotic hemorrhages of the arachnoid, visceral pleura, epicardium, myocardium, endocardium, renal capsules, ileum and cecum.
3. Toxic hepatitis.
4. Bilateral ovarian hemorrhagic cysts.
5. Hyperplastic splenitis.
6. Sanguineous peritoneal fluid (small amount).

Although this is the first reported case of the development of a blood dyscrasia with a fatal outcome following the use of mapharsen, it is interesting to note that Goldberg¹⁰ reported a syphilitic pregnancy in which mapharsen prevented congenital syphilis and at the same time did not cause a recurrence of a serious hemopoietic complication (granulocytopenia), which had occurred after treatment with another arsenical.

COMMENT

The majority of the patients in this series tolerated the mapharsen therapy well and presented no serious untoward reactions, except for those described. Among the 113 patients, who received altogether 2,342 injections of mapharsen, sixteen had mild gastrointestinal reactions (nausea), eleven had nausea and vomiting, four complained of mild headaches and attacks of dizziness, three had pruritus, and one developed herpes simplex. Of these 113 patients, ten had similar reactions with other arsenical preparations, such as neoarsphenamine, silver arsphenamine and arsphenamine. Fifteen patients developed the more serious delayed reactions; two had chills and fever; four developed generalized erythematous eruptions; five had an exacerbation of a preexisting dermatitis (three with seborrheic dermatitis and two with a discoid vesicular dermatitis); two developed fixed eruptions; one complained of precordial pain, and one developed albuminuria.

Mapharsen had to be discontinued for a short time in some of these cases. In three cases the drug had to be stopped entirely because of the recurrence of untoward reactions. In thirteen cases there was no recurrence

9. Drs. Lynn J. Boyd and Van Alstyne Cornell, of the Metropolitan Hospital, gave permission to use the data obtained while the patient was in the hospital.

10. Goldberg, Mortimer: Mapharsen as a Substitute for Neoarsphenamine in Agranulocytic Angina Following Neoarsphenamine Therapy in a Pregnant Syphilitic Woman, *Am. J. Syph., Gonorr. & Ven. Dis.* 23: 79 (Jan.) 1939.

of the reactions when mapharsen therapy was resumed at a reduced or a similar dosage. For two patients treated by Dr. Girsch D. Astrachan (one with nausea, vomiting and fever and the other with headaches, vomiting and fever) the recurrence of these reactions was prevented by the intramuscular injection of liver extract from fifteen to thirty minutes prior to the injections of mapharsen, as advocated by him in a recent publication.¹¹ We were not able to prevent the recurrence of reactions by the oral administration of compound solution of iodine prior to the mapharsen injection.

Some patients had a variety of untoward reactions with the various arsenicals in the course of previous antisyphilitic therapy but did not develop a recurrence of these reactions when they received mapharsen. In this group there were twenty patients with the following reactions: Five had nitritoid reactions, eight had nausea and vomiting sometimes associated with fever, chills, headaches or attacks of dizziness, three had arsenical dermatitis, one had urticaria, and one had angioneurotic edema of the face and hands.

CONCLUSIONS

1. Mapharsen is adequate to control early infectious rapid sterilization of active reactions.
2. The majority of syphilitic patients treated by the physician in private practice are in the latent asymptomatic stage. Mapharsen, possessing relatively lower toxicity, is preferable in such cases to other drugs, which have a greater tendency to produce untoward reactions.

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ABSTRACT OF DISCUSSION

DR. GIRSCH D. ASTRACHAN, New York: The main value of this paper lies in the publication of a fatality which could be attributed to the use of mapharsen. This report should draw the attention of physicians to the potential dangers of mapharsen and make them weigh carefully all the necessary indications and contraindications. Dr. Wise and I came to the conclusion some time ago that mapharsen should be preferred in late latent syphilis. Mapharsen is useful also in cases of late congenital syphilis, cases of cardiovascular syphilis and cases in which drastic energetic therapy is not desirable. As a result of a recent study on a limited number of cases (twenty-four) I gained the impression that mapharsen is as efficient as neoarsphenamine in cases of syphilis and pregnancy. Mapharsen has a well deserved place among the efficient antisyphilitic remedies but, regardless of its lower toxicity, it is a powerful arsenical and may be very harmful if used without caution. This factor is being ignored by some physicians, who in their enthusiasm begin to use mapharsen in cases in which sensitiveness possibly exists to the arsphenamines, or in which the arsphenamines are contraindicated. A case is reported in which granulocytopenia developed after the administration of neoarsphenamine and soon after mapharsen was administered. Although this patient benefited greatly from mapharsen therapy, I believe that no trivalent arsenicals should be used again in cases in which there is a history of a blood dyscrasia. I am also against the use of mapharsen (especially in maximum doses) in cases of advanced tuberculosis. Because of several reports of severe complications following the continuation of arsphenamine therapy in cases of ninth day erythema, I believe that as a matter of safety such cases should be regarded as average cases of sensitivity to arsenicals. Only after a blood count and liver function and urine tests are found to be normal should the arsenical be renewed cautiously, beginning with small doses. A blood count was done in most of our cases before mapharsen therapy was instituted and was repeated at the completion of a course of

treatment. This procedure helped to discover signs of beginning dyscrasia of the hemopoietic system before clinical manifestations appeared. I agree with the authors that the efficacy of mapharsen is greatly increased when it is given together with injections of bismuth compounds.

DR. H. M. ROBINSON, Baltimore: It is my impression, after seven years' experience with mapharsen, that it is an adequate antisyphilitic agent. Furthermore, mapharsen is almost the equal of arsphenamine and is superior to neoarsphenamine. Nevertheless I am convinced that none of the generally accepted antisyphilitic drugs need be discarded from our armamentarium. Each drug seems to have some place in our scheme of therapy. In general, I believe that physicians should bear in mind the fact that any of the reactions caused by the trivalent arsenicals can also be caused by mapharsen. Also the patient should be warned beforehand of the local, painful vein reactions. With these provisos I think the drug would be preferable in an office as well as in a clinic. The spirochetes are killed in from six to seven hours by both arsphenamine and mapharsen. It takes somewhat longer for neoarsphenamine to accomplish this result. As for serologic reversal, the work of Moore and his co-workers showed that the serologic reversal is about equal with neoarsphenamine, mapharsen, silver arsphenamine and bismarsen, and that arsphenamine caused a slightly quicker reversal to negative. Several of our patients developed jaundice resulting from mapharsen, a few of them quite serious. There have been two cases of exfoliative dermatitis. However, we have encountered several cases of mild exfoliative dermatitis due to arsphenamine in which the patients could tolerate mapharsen. Sometimes it is important to be able to continue with an arsenical in the treatment of syphilis, especially in pregnancies and in early syphilis, and it is my conviction that mapharsen should be tried before all arsenicals are excluded from consideration. Knowing that many practitioners and specialists are careless about the preparation of the arsenicals, mapharsen comes nearer being a foolproof arsenical than the arsphenamines. You can stir it as much as you want to within reason. In fact, it is advisable to stir it thoroughly in order to liberate the carbonate. If you agitate the arsphenamines too strongly they become toxic. I think mapharsen will probably supersede neoarsphenamine as a drug of general usage, but not entirely, because there are still some patients who cannot tolerate mapharsen but can tolerate neoarsphenamine. Therefore, neoarsphenamine should not be discarded but held in reserve.

DR. WILLIAM BECKER, Chicago: I was gratified to hear the authors and Dr. Astrachan give their preference for the concurrent method of treatment, because we have used that for many years in our clinic. We have always thought that it had advantages over the alternating system of therapy and we have not experienced any increase in reactions from its use. In mapharsen one has what is probably the active drug that is liberated by arsphenamine in the body. Chemical methods as yet are inadequate, so that we do not know how much arsenoxide is liberated over a certain period of time from one of the arsphenamines. It may even be that if mapharsen was given in small doses, several times daily, we would be approaching the optimal method of administration. I have always been favorably inclined toward the use of bismuth. Levaditi and certain French workers found that they could almost, but not quite, cure syphilis with bismuth. Our treatment system is incorporated on that principle; that is, we use a lot of bismuth and not a great deal of arsenical. When a patient comes with an early lesion, primary or secondary, instead of starting out with a long series of arsenical injections we give bismuth right from the start. We give the patient a small dose of mapharsen, along with a small dose of soluble bismuth. This is repeated two days later and again two days after that, after which we give it once every five days or once weekly. I believe that this combination therapy will have the advantage of preventing the appearance of the so-called refractile cases. In other words, if one starts out with a long series of arsenical injections, one may find that pretty soon the lesions instead of becoming better will become worse, but if you give bismuth right from the start I think that this relapse will probably be prevented. I believe that a great deal of bismuth and not so much mapharsen given by the concurrent method is an extremely good method for the practitioner and is safer than the other methods.

11. Astrachan, G. D.: The Value of Administration of Liver in Patients Intolerant to Arsenicals, *J. Invest. Dermat.* 1: 427 (Dec.) 1938.

DR. LEON GOLDMAN, Cincinnati: In Cincinnati recently there was a fatal case from mapharsen and this report is from the Chronic Disease Hospital and is by several men in the medical service there. The case will appear shortly in the literature. A middle aged man developed hematuria and then renal insufficiency following mapharsen. To compensate for this somewhat, at this hospital we have been conducting a study purely for academic purposes on the effect of mapharsen on late and latent syphilis in patients who are 70 and 80 years old.

DR. CHARLES R. REIN, New York: Although a number of the patients in this series showed a satisfactory serologic response following mapharsen therapy, the incidence was not as high as should be expected if a similar number of patients with early syphilis were treated with the same preparation. In our series the majority of patients had their infections for many years and received an average maximum of only twenty injections per patient. Dr. Sharp, of Detroit, was kind enough to review our report and made the following note regarding the fatality which occurred during mapharsen therapy: "The development of anemia, leukopenia accompanied by neutropenia and thrombocytopenia in the patient receiving antisyphilitic therapy are presumptive signs of chemical toxemia. Inasmuch as similar hemopoietic patterns do occur frequently in nonsyphilitic patients not having received any drugs within a reasonable period of time prior to acute hematologic manifestations, unknown etiologic factors cannot be excluded from consideration. I do not recall how many similar cases I have studied, but the clinical picture is not uncommon and infection of a degree ordinarily regarded as inconsequential occasionally is the only discernible pathogenesis." It is quite possible that the blood dyscrasia in this patient may have been due to something other than the mapharsen. Mapharsen should be used with a great deal of discretion. If administered indiscriminately it may produce serious untoward reactions.

SURGICAL LESIONS OF THE PARATRIGEMINAL AREA

LOYAL DAVIS, M.D.

AND

JOHN MARTIN, M.D.

CHICAGO

In 1923, one of us¹ called attention to the clinical syndrome produced by lesions of the paratrigenal area. In this small anatomic space are located the sensory and motor roots of the fifth cranial nerve, the gasserian ganglion and its three branches, the carotid artery and the plexus of the sympathetic nerve fibers which surround it, and the oculomotor, trochlear and abducens nerves which innervate the extra-ocular muscles (fig. 1). Obviously, with all these important structures crowded into a small area the potentialities of many symptoms from even a very small lesion are great.

In one of our two cases reported at that time there were excruciating pain in that area of the right side of the face supplied by the ophthalmic and maxillary divisions of the trigeminal nerve and paralysis of the sympathetic nerve fibers innervating the eyeball, as evidenced by a small pupil which failed to dilate after the introduction of cocaine solution, a narrowed palpebral fissure due to an enophthalmos and an absence of the ciliospinal reflex. Autopsy disclosed a small aneurysm of the internal carotid artery. A second patient also suffered with pain of a similar excruciating character but distributed in the area supplied by all three

divisions of the left trigeminal nerve. She presented ptosis of the left upper eyelid, dilatation of the pupil and paralysis of all the extra-ocular muscles supplied by the left oculomotor nerve. This patient, too, proved to have an aneurysm of the internal carotid artery at autopsy. The third case included in the original report had been cited by Raeder² in 1918. In common with

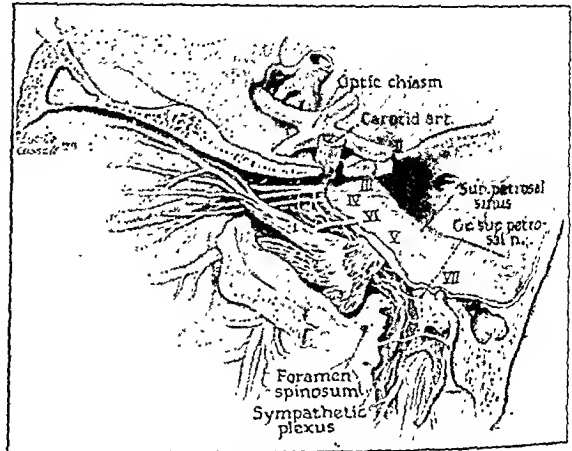


Fig. 1.—Anatomic relations in the paratrigenal area.

our cases there had been severe pain on one side of the face in the area supplied by the trigeminal nerve. A small pupil, enophthalmos and paralysis of the muscles supplied by the motor division of the trigeminal nerve completed the clinical symptoms. Raeder stated that at autopsy a small "endothelioma" was found originating from the medial edge of the gasserian ganglion.

During the past sixteen years fourteen other cases have been observed in which the symptoms may be classified as belonging to this syndrome. In six instances the lesion was verified as an aneurysm of the internal carotid artery either at autopsy or at operation; in seven cases a small meningioma, wholly confined to the dural envelop which encloses the gasserian ganglion, was removed at operation and verified microscopically and in the one remaining case neither an aneurysm nor a tumor could be verified at operation, although following the surgical exposure of the paratrigenal area the symptoms have subsequently all disappeared.

Attention is again called to the lesions which occur in this area not only because of the interesting clinical syndrome which is presented in any one of several combinations of symptoms but because (1) the symptoms must be differentiated from those which occur in cases of major trigeminal neuralgia, the etiology of which is as yet unknown, and (2) because the symptoms of one half of the patients in this group have been relieved by operation.

Without exception, all these patients presented themselves for relief of the severe pain which they suffered in the area of distribution of the trigeminal nerve. Failure to obtain relief from this persistent excruciating pain by the usual analgesic drugs or by alcohol injections had led them, directly or by reference, to seek surgical attention. This pain is one of the first symptoms noted by the patient and in our experience has occurred in one, two or all branches of the gasserian ganglion, but without fail the ophthalmic division has always been involved. A trigger zone, so pathognomonic of trigeminal neuralgia, may or may not be present.

From the Division of Surgery, Northwestern University Medical School.

Read before the Section on Surgery, General and Abdominal, at the Nineteenth Annual Session of the American Medical Association, St. Louis, June 17, 1939.

¹ L. Davis, Loyal E.: Lesions of the Paratrigenal Area. *J. A. M. A.* 80:380 (Feb. 10) 1923.

² Raeder, G.: Report of a Case of Endothelioma in the Paratrigenal Area. *Norsk. mag. f. lægevidensk.* 79, 1918.

Though sharp and severe the pain seldom has had the paroxysmal character of true trigeminal neuralgia, nor is it as shocking and terrifying to the patient. Often the pain seems to radiate peripherally from an origin located indefinitely by the patient as "somewhere behind the eye." Several patients have complained of a severe, dull headache localized to a point deep within the anterior portion of the cranium on the affected side.

Without exception we have found that when this syndrome has been due to a small meningioma, originating within the dural envelop which encloses the gasserian ganglion, there have been small patchy areas of paresthesia, numbness and even complete loss of sensation to pin prick and touch stimuli in the ophthalmic and maxillary areas of the face on the side of the lesion. This is so constant an occurrence, if examined for carefully and meticulously, that we have come to regard it as pathognomonic of the presence of such a tumor. Raeder did not comment on a loss of sensation by his patient who had an "endothelioma," which we assume is the term commonly in use twenty years ago for this same type of tumor. Involvement of the motor division of the trigeminal nerve, as noted by Raeder in his case, was also present in two of our cases (both with tumors) but the paralysis of the pterygoid and masseter muscles was only partial.

Accompanying these symptoms of involvement of the trigeminal nerve have been the signs produced by involvement of the third, fourth and sixth cranial nerves, which innervate the extra-ocular muscles. As might be expected, these nerves may be affected singly or in any possible combination. The most common manifestations have been those which pointed to the oculomotor nerve and have been characterized by a dilated pupil, an actual ptosis of the upper eyelid and divergence of

the eyeball to the outer canthus. In two cases, in which there was a meningioma, there was a complete paralysis of the external rectus muscle, pointing to a lesion of the abducens nerve, and in another case, in which there was a large aneurysm of the internal carotid artery, a complete ophthalmoplegia was present. In no instance in which a meningioma was found and removed at operation have the extra-ocular muscles failed to recover their function. In fact, the marked ocular

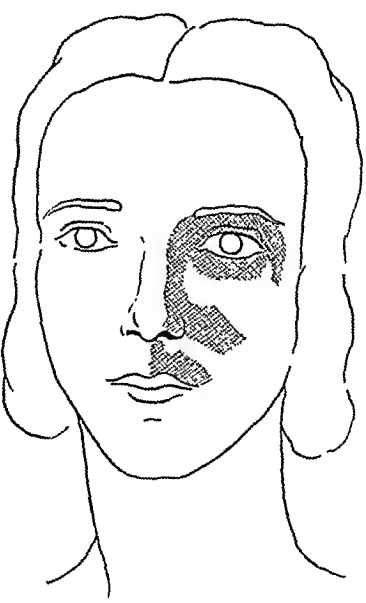


Fig. 2.—Loss of sensation in the face caused by meningioma in the paratrigenal area.

symptoms have been more characteristic of the cases in which there were aneurysms of the internal carotid artery.

When the sympathetic nerve fibers which surround the carotid artery and accompany the ophthalmic division of the trigeminal nerve are involved, a typical Horner's syndrome is produced with enophthalmos, a narrowed palpebral fissure and a small pupil which will

fail to dilate after the introduction of cocaine solution. Under these circumstances, which most often occur with aneurysms of the internal carotid artery, the ciliospinal reflex is also absent.

That surgical help can be given to at least one half of these patients in our experience and that a shrewd guess can be made that a small meningioma rather than



Fig. 3.—Low power section showing characteristic microscopic appearance of the meningiomas found in the paratrigenal area.

an aneurysm is present and that these patients come to the surgeon for relief of the severe pain in the face is illustrated by the following case:

A woman aged 50 first complained of a jabbing, knifelike pain in the left eye in June 1937. This was not present constantly but came in attacks and soon involved the left frontal and the left maxillary areas. Cold air, rubbing the left temporal area or touching the site of the removed left canine tooth brought on the pain. At frequent intervals diplopia would be present for hours or days at a time.

On examination, stimulation of the zones described by the patient produced a sharp increase in her pain but it was obvious that she was never entirely free from a pain described as "deep in the left eye." No impairment of the extra-ocular muscle movements could be elicited on examination. There was a loss of sensation to light touch and pin prick stimuli over the left upper lip, left ala and left side of the nose which extended laterally about 2 cm. The left upper and lower eyelids were also insensitive (fig. 2).

At operation the gasserian ganglion enclosed in its dural envelop appeared coarse, large and red. When the envelop was opened a purple soft mass was found occupying the site of the ganglion and wholly enclosed within its dural envelop. The mass was removed completely and the sensory root divided.

The patient has had no recurrence of her pain, and no new symptoms have developed during the past year following her operation.

This story is quite typical in the six other cases in which a tumor in the same location, with the same gross appearance and with the microscopic characteristics of a meningioma, has been removed. In each instance

there has been severe pain in the trigeminal area and except for the last three cases an operation was devised for the relief of trigeminal neuralgia. The presence of small, scattered areas of sensory loss in the trigeminal area on the side of the pain has led us to the correct diagnosis in the last three cases.

These tumors are not tumors of the gasserian ganglion and show none of the microscopic characteristics of such tumors, which are not uncommonly found.



Fig. 4.—High power section showing characteristic microscopic appearance of the meningiomas found in the paratrigenal area.

As is shown in figures 3 and 4, the tumor tissue is composed of a uniform epithelioid type of cells with central round, granular or reticular nuclei, which are arranged in poorly defined whorls about central blood vessels. Other more elongated endothelial-like cells are present and mitoses are fairly common.

These are not the large tumors which Cushing has described in his monograph "The Meningiomas" as "sitting like a saddle astride the anterior end of the petrous ridge." That, if allowed to go unrecognized for any length of time, they would eventually grow to extend into the middle and posterior fossae of the skull is quite probable. However, in these seven instances the severity of the pain has forced early surgical intervention and as yet we have seen no evidences of recurrence of the tumor though the first operation was performed eleven years ago.

The story of the patients with an aneurysm which produced paratrigenal symptoms and signs is not a happy one, but in view of the potentialities of the lesion it may be of much longer duration than one would at first imagine:

A woman aged 47 had a severe pain in the right eye followed by a terrific generalized headache while attending a funeral in 1932. Her vision was dim and she had a diplopia. The headache, present since the onset, was described as a sharp, continuous pain over the right temporal area which varied in intensity. This pain seemed to "shoot through" the right eye in attacks and when this occurred, as it did about once a week, she became nauseated, vomited and had a true vertigo. A

"boiling, drawing" pain had been present over the vertex of the skull since 1934. Although she had diplopia from the onset, she did not notice that her right eye was turning to the left and that the pupil was large until a year later.

In 1937 it was noted that the right upper eyelid was "drooping" and she could not open her eye easily. Simultaneously a tingling, fiery, sharp pain occurred frequently in the right side of the face and would last about fifteen minutes, to be followed by numbness in the right side of the tongue, the teeth and gums on the right side.

There was a definite ptosis of the right upper eyelid, and the right pupil was larger than the left and reacted sluggishly to light. The visual fields and acuity were normal in both eyes. In looking upward and to the left and right, the right eye did not move at all but did move on looking down (fig. 5). There was diminution to pin prick and touch stimuli over the right maxillary area and on the right side of the tongue.

At operation an enormous aneurysm of the internal carotid artery extended upward and laterally into the middle fossa.

Although it has been assumed that the majority of such intracranial aneurysms are the result of syphilis, the serologic reaction of this patient and the other five patients has been negative. Seven years since the onset of her first symptoms and one year since operation, the patient continues with her household affairs with frequent attacks of pain which incapacitate her.

In 1937 Dandy³ reported a case in which there was an intracranial aneurysm of the internal carotid artery. He operated and was able to put a silver clip on the neck of the aneurysm. The symptoms were very similar to those we have found in our cases. As Dandy properly remarks, one cannot be sure that even after an aneurysm is disclosed at operation it will prove to be amenable to surgical attack. As in our case just cited, the aneurysm was far too large for one to be able to disclose the point of its origin. On the other hand,



Fig. 5.—Appearance of patient with an aneurysm of the internal carotid artery, showing ptosis of the pupil and ophthalmoplegia.

Dandy's report is of considerable interest because if these cases can be diagnosed early enough and the aneurysm is small, the situation is not entirely hopeless.

Extensive paralysis of the extra-ocular muscles has been quite characteristic of the cases of aneurysm of the internal carotid artery and in our experience the oculomotor nerve has been more constantly involved than the

3. Dandy, Walter E.: Intracranial Aneurysm of the Internal Carotid Artery, *Tr. South. S. A.* 50: 14, 1937.

other nerves to the extra-ocular muscles. With respect to the pain, it is our opinion that in the cases in which there is an aneurysm the character and distribution of the pain does not resemble the pain of trigeminal neuralgia as closely as it does in the cases in which there are meningiomas of the dural envelop of the ganglion. Neither have we found the presence of a sensory loss as constant in the instances of aneurysm.

SUMMARY

A group of patients who seek relief from severe, excruciating pain located in the distribution of the trigeminal nerve also present symptoms pointing to involvement of the other structures located in the paratrigeminal area. Paresis or paralysis of the extra-ocular muscles or intrinsic muscles of the eye should direct attention to the possibility of a lesion in this area. Small tumors confined within the dural envelop of the gasserian ganglion verified as meningiomas and aneurysms of the internal carotid artery have been encountered in sixteen cases in which there were various combinations of symptoms characteristic of a pathologic condition in the paratrigeminal area. The prognosis in the cases of intracranial aneurysm has been uniformly poor but on the contrary in each instance the tumors found have been removed successfully.

54 East Erie Street.

ABSTRACT OF DISCUSSION

DR. ERNEST SACHS, St. Louis: This paper deserves a great deal of attention because the differential diagnosis comes up not infrequently between a true tic douloureux and pain in the face due to a tumor in the region of the gasserian ganglion. I operated in a case of this sort in 1915 and at that time I attempted to differentiate between the symptoms of true tic douloureux and tumors arising in this region. One of the points that I feel is particularly important is that whereas in true tic douloureux the patient has intermittent attacks of pain, in this disease it is constant. That is one of the important early differential points; and the other is that the motor root of the fifth nerve is involved; whereas in true tic douloureux I have never seen involvement of the motor root. When I operated in this case I was under the impression that I was dealing with an endothelioma. The patient, however, had a recurrence after one year and died. I did not attempt to reoperate on her. I believe that this should properly be called a malignant tumor. The six cases of Dr. Davis were aneurysms, meningiomas and benign tumors. As a rule, they are benign, and I have recently had two cases similar to the ones he has described, but in neither of them were the third, fourth and sixth nerves involved. I believe that it may be possible to diagnose this condition at an earlier stage if one is so fortunate as to see them early, the important differential point being that in this condition the pain is constant and there is involvement of the motor root, which is not found in trigeminal neuralgia. In one of my cases the meningioma lay on the posterior root of the ganglion and was so small that it had not yet pressed on any of the neighboring nerves. This is unusual; as a rule the meningioma is larger and involves some other nerves, as in Dr. Davis's cases.

A Method Imperfectly Understood.—The healthiest trend of modern medicine—and let it be said at once that it is a trend which is anything but universal—is to dispense as far as possible with special methods of investigation in dealing with the everyday patient. The special method is for the investigator into pathological processes; it is not for the pure clinician. The use of special devices, of special tests, almost always leads one way: the devices and tests are employed by men who cannot have the training, cannot afford the time fully to understand, and a method imperfectly understood is, generally speaking, worse than useless.—Lewis, Sir Thomas: *Research in Medicine and Other Addresses*, London, H. K. Lewis & Co., Ltd., 1939.

CONTACT DERMATITIS FROM OPIUM DERIVATIVES

WITH SPECIAL REFERENCE TO OCCUPATIONAL ASPECTS

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AND

EARL D. OSBORNE, M.D.

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Drug eruptions from the ingestion of or parenteral use of morphine, codeine and other opium derivatives are well known to dermatologists. Most American authors of textbooks on dermatology include opium and its derivatives as a cause of drug eruptions. Scheer and Keil¹ in 1934 called attention to codeine as a cause of dermatitis medicamentosa. Touraine² in 1936 exhaustively described drug eruptions from opium compounds. Many morphologic types of eruption have been produced by the ingestion of or parenteral use of opium compounds. The most common are urticarial, morbilliform or scarlatiniform, but eczematous eruptions in which the chief allergic response is at the same site as in contact dermatitis have been described. Thus opium compounds are capable of producing not only an urticarial and scarlatiniform eruption but also an eczematous response when taken internally by ingestion or injection.

Eczematous dermatitis from opium compounds used externally in the form of lotions, suppositories and the like has been recorded in the foreign literature for many years. Touraine² thoroughly reviewed this literature and stated that Comanus reported the first case in 1882. Since then Bodin in 1901 and Bourges in the same year recorded similar observations. To our knowledge two analogous cases have been reported in the American literature. In one of these, reported by Heller in 1931,³ lead and opium wash was applied externally to the genital area. This resulted in a severe eczematous dermatitis. In the second case, reported by Cumber,⁴ also in 1931, ethylmorphine hydrochloride had been used in the eye with resulting dermatitis of the lids.

Reports of occupational dermatitis due to opium and opium derivatives have appeared sporadically in the European literature. Touton,⁵ in Jadassohn's Handbook, recorded six cases. Pignot⁶ reported eighteen such cases at the sixth International Congress of Industrial Diseases. Touraine and Scémama⁷ reported a case in 1936. Cranston Low,⁸ in his book *Anaphylaxis and Sensitization*, stated that dermatitis from opium compounds is commonly seen in workers engaged in the manufacture of these drugs. We have been unable to find a report of occupational dermatitis due to morphine

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Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Scheer, Max, and Keil, Harry: *Skin Eruptions of Codeine*, J. A. M. A. 102: 908 (March 24) 1934.

2. Touraine, A.: *Les dermatoses de l'opium*, Rev. de méd., Paris 53: 449-460 (Nov.) 1936.

3. Heller, N. B.: *Acute Dermatitis Due to Opium Preparations*, Arch. Dermat. & Syph. 24: 417 (Sept.) 1931.

4. Cumber, C. L.: *Dermatitis of Eyelids Caused by Dionin: Development of Local Hypersensitivity After Eleven Years' Use*, Arch. Dermat. & Syph. 23: 68 (Jan.) 1931.

5. Cited by Touraine.²

6. Pignot, M.: *Dermatose éruptive chez des ouvriers fabriquant de la morphine*, VI Congrès international des accidents et des maladies du travail, Genève, 1931, p. 65.

7. Touraine, A., and Scémama: *Dermatite professionnelle par dérivés de l'opium*, Bull. Soc. franç. de dermat. et syph. 43: 1697 (Nov.) 1936.

8. Low, R. C.: *Anaphylaxis and Sensitization*, Edinburgh, W. Green and Son, Ltd., 1924, p. 182.

or other opium derivatives in the American literature. Likewise we have been unable to find any record of occupational dermatitis in nurses, pharmacists, physicians or other workers who come in contact with these substances in the course of their professional duties. Our discovery of three such cases in nurses and one in a young woman who was employed in the manufacture of morphine tablets has prompted us to present this subject. We believe that opium and its compounds may be an important though unrecognized cause of dermatitis in nurses, physicians, pharmacists and workers engaged in the manufacture and handling of these compounds.

Opium contains two chief classes of alkaloids:⁹ benzyliso-quinolene derivatives, of which papaverine and narceine are examples, and phenanthrene derivatives, of which morphine, codeine and cibane are natural alkaloids and from which synthetic compounds are manufactured, such as ethylmorphine hydrochloride; apomorphine, a dehydrated morphine compound; heroin, or diacetylmorphine, and many others. Most cases of contact dermatitis that have been proved to be due to opium compounds have been due to the phenanthrene derivatives. For example, Lewin⁵ reported a case due to apomorphine. Low believes that codeine is the most common cause. Pignot's eighteen cases occurred among workers with morphine, codeine and heroin. He noted dermatitis most commonly in workers engaged in the purification of diacetylmorphine or heroin and its hydrochloride. Touraine and Scémama obtained positive intradermal tests to both narceine, a benzyliso-quinolene derivative, and codeine, a phenanthrene derivative. However, the results of intradermal tests are of little value since, as Pilcher and Sollmann¹⁰ have shown, most normal persons have a positive intradermal reaction to morphine.

REPORT OF CASES

CASE 1.—E. B., a student nurse aged 21, was first seen in 1930, at which time she complained of an eruption of one week's duration on the third and fourth fingers of the left hand. The eruption was confluent and papulovesicular and was accompanied by considerable itching. The condition was tentatively considered to be ringworm but no proof was established. The eruption partially subsided at the end of a week; three weeks later it recurred in greater severity on the hands. She was advised to discontinue work and at the end of a week was much improved. The condition at this time was considered plant dermatitis. Three weeks after the patient's return to work a new attack of dermatitis appeared on the hands and face, with marked swelling of the eyelids. At the end of a week the dermatitis on the face subsided, but the eruption on the hands persisted. During the next month she continued to have slight exacerbations, with periods of quiescence. She was patch tested to all the plants with which she came in contact in the wards, with negative results. One month later she had another severe outbreak and she was tested to chloroform, solution of formaldehyde, grain alcohol and rubbing alcohol, all reactions being negative. She continued to have exacerbations and periods of relative quiescence during the next two years. We then patch tested her to morphine in dilutions of 1:100, 1:1,000, 1:10,000, 1:100,000 and 1:1,000,000. She showed a strongly positive eczematous response to all these dilutions. She was then tested to apomorphine, papaverine, ethylmorphine hydrochloride and codeine, all in a dilution of 1:1,000. With this

dilution the reactions were moderately positive to apomorphine, papaverine and ethylmorphine hydrochloride but not as strongly positive as they had been to morphine 1:1,000,000. Codeine gave negative results. At one time the patient was away from work for one year, during which time she had no recurrence of the dermatitis. It promptly recurred when she returned to her regular duties. She was therefore transferred to the outpatient clinic in dermatology and had no dermatitis during the week, but after week ends, when she was required to perform relief duties in the wards, each Monday she reported a mild recurrence in spite of the fact that she did not actually, to her knowledge, come in contact with opium or its derivatives. The problem was solved by having her work in the x-ray department, where no morphine or other opium derivatives were used. Subsequent observations showed that the air of the general ward where morphine was used produced itching and burning of the exposed skin when she was in the room for a few minutes. Attempts at desensitization, using baths of morphine sulfate in dilutions greater than 1:1,000,000,000, produced general erythema and had to be abandoned.

CASE 2.—F. A., a student nurse aged 20, first developed an eruption on the hands in July 1934. At this time she had been in training for about a year and was working in the surgical clinic. She applied fungorex, a proprietary remedy, and the eruption disappeared. She then went to work in the hospital diet kitchen and two days later the eruption recurred. She was first seen on August 4, at which time she had a confluent erythematous vesicular dermatitis about the nails of both hands and a few lesions on the palms and backs of the hands. She was patch tested to the soap she was using and to solution of formaldehyde U. S. P. diluted 1 to 400. Reaction to the former was negative but the formaldehyde gave a strong positive reaction. During the next four months she continued to have recurrences in spite of the fact that she was not exposed to formaldehyde. She was not seen again until November 1936, at which time she had a papulovesicular eruption involving the fingers and dorsum of the hands, which had been present for several months. She gave no history of contact with formaldehyde. Two months prior to the visit in 1936 she had taken a codeine tablet and the next day had a generalized eruption. This disappeared in a few days. She was patch tested to codeine 1:100 and morphine 1:100. Both tests were strongly positive. During the past four years she had noted that each time she handled a morphine tablet the dermatitis recurred. She had no recurrences when she was not exposed to morphine.

CASE 3.—V. M., a student nurse aged 19, when first seen in January 1937 had a discrete deep-seated vesicular eruption involving the left palm and wrist, with an area of confluent scaling dermatitis at the base of the right fourth finger. This eruption had been present approximately ten days. At this time she had been in training about a year and a half. Mycotic infection was suspected and under treatment the eruption disappeared. During this period she was working in the diet kitchen. In December 1937 a severe recurrence developed while she was working in the surgical ward. Patch tests were applied with 1:100 dilutions of mercury bichloride, atropine sulfate, procaine hydrochloride, morphine sulfate, papaverine and codeine, and with thymol iodide powder, saturated solution of boric acid, 5 per cent boric acid ointment, zinc oxide, face powder, dusting powder, hand lotion, alcohol, three different soaps, tincture of benzoin and theobroma oil, all of which she handled in the course of her work. There was a strongly positive reaction to morphine and papaverine and a weakly positive reaction to codeine. During the next week she carefully avoided morphine and other opiates, and the dermatitis disappeared. She then was required to take care of a patient receiving morphine injections and developed another severe recurrence on her hands. Because of the dermatitis she discontinued training. The dermatitis did not completely disappear for several months. She had no recurrence for one and a half years. During this interval she did not come in contact with morphine. She then gave one hypodermic injection of morphine to a patient and the next day an acute vesicular dermatitis appeared on the

9. Small, L. F.: *Chemistry of the Opium Alkaloids*, Supplement 103 to Public Health Reports, U. S. P. H. S., 1932. Sollmann, Torald: *A Manual of Pharmacology*, ed. 5, Philadelphia, W. B. Saunders Company, 1937, p. 273.

10. Pilcher, J. D., and Sollmann, Torald: *Skin Reaction to Morphine*, Arch. Int. Med. 33: 516 (April) 1924.

hands, accompanied by erythema and edema of the face. She had used precautions to avoid direct contact with the morphine tablet.

CASE 4.—F. G., a woman aged 48, a medicinal tablet molder, first seen in October 1938, had worked ten weeks molding morphine and strychnine tablets for a drug company. Three weeks after she began this work an eruption appeared on the flexor surface of the arms, particularly about the antecubital areas. The eruption spread to the back of the neck, the hands and the eyelids. In the course of her occupation she came in contact with powdered morphine and powdered strychnine. She continued with her work for three weeks after the first appearance of the dermatitis, during which time the eruption became more severe. She discontinued work on August 24, approximately six weeks before we first saw her. During this time she had received treatment from her family physician. Her skin had gradually improved, so that when we first saw her she had a mild dermatitis about the face with slight swelling of the eyelids, a dry scaling dermatitis in both antecubital areas, and discrete papulovesicular lesions on the forearms and the dorsum of the hands. She was patch tested to morphine, ethylmorphine hydrochloride, papaverine, apomorphine, codeine and strychnine, all in a dilution of 1 to 100. At the end of twenty-four hours morphine and ethylmorphine hydrochloride gave a moderately positive reaction and papaverine and apomorphine weakly positive reactions. At the end of forty-eight hours the reactions to morphine and ethylmorphine hydrochloride were still moderately positive, while the test to papaverine was slightly less positive and the test to codeine had become mildly positive. The test to apomorphine was now negative, and strychnine at no time showed any results. She was referred back to her family physician and has not been seen since.

COMMENT

The three cases of dermatitis in nurses and the case of dermatitis in a worker with morphine, in addition to the reports of European observers, demonstrate that morphine and other opium derivatives are potential eczematogenous agents. The opium alkaloids, like many other alkaloids and other plant derivatives such as quinine and strychnine, are capable of producing the allergic contact type of dermatitis and should be borne in mind when one sees an eczematous type of dermatitis in nurses, workers in drug houses or others whose occupation or profession requires them to be in contact with these substances. We believe a suspicion of morphine and related compounds as a cause of occupational dermatitis in this group of workers will result in the discovery of many more cases in this country. The eruption in our three nurses appeared first on the hands, with a clinical appearance easily confused with that of ringworm infection. In the case of the morphine tablet molder, if the history was correct, the eruption first appeared in the antecubital areas, probably because the morphine was in powdered form. Other exposed areas were involved subsequently. In all three nurses the dermatitis first appeared on the hands and in cases 1 and 3 later involved other exposed cutaneous areas. Morphine dermatitis, therefore, may remain localized to the hands and thus simulate ringworm infection or contact dermatitis due to other causes such as solution of formaldehyde and soaps. It may primarily involve other areas than the hands and simulate a dermatitis due to plants, dyes or dusts. Extreme degrees of sensitization may be encountered, as in case 1, in which dilutions of 1:1,000,000 produced a strongly positive patch test and exposure to the air in the wards produced clinical symptoms. Our attempts at desensitization in morphine dermatitis have proved a complete failure, as have our attempts at desensitization in other cases of the contact type of dermatitis.

SUMMARY

1. Opium and its compounds, particularly phenanthrene derivatives, deserve more attention as eczematogenous agents and as a cause of the contact type of dermatitis.

2. This group of drugs should be suspected as a cause of eczematous dermatitis of unknown etiology in nurses, physicians and pharmaceutical workers.

417 Delaware Avenue.

ABSTRACT OF DISCUSSION

DR. M. B. SULZBERGER, New York: The striking fact in this report is that it concerns not an isolated instance but three cases of contact-type eczematous dermatitis caused by opium derivatives. That brings up the point as to the practical significance of these substances as causes of contact-type dermatitis; that is, how many cases per thousand are produced by exposure to opium derivatives. The number may be more than was previously believed but still not very great. However, we must always at least think of this possibility, particularly when we face contact-type eczematous dermatitis in physicians, nurses, druggists, persons dealing with pharmaceuticals and their manufacture, and individuals receiving treatment with codeine, morphine or other opium alkaloids. As the authors point out, a few such cases have been reported in the foreign literature. The question brought up by Drs. Jordon and Osborne's paper is also the route of the access to the skin. We know that allergens which produce contact-type eczematous dermatitis may arrive at the skin and produce eczematous reactions not only on exposure from without but also when they are given by injection, by ingestion or in any other way, provided the skin is sufficiently sensitive and that enough of the agent gets to the actual shock tissue. In Jordon and Osborne's series there is one case mentioned in which codeine given by mouth produced the eczematous eruption on the skin but no internal or mucous membrane reactions. Now there are similar analogous situations in contact-type dermatitis to a great variety of allergens. There are cases of eczematous eruptions due to solution of formaldehyde after the ingestion of methenamine and in which no mucous membrane reactions occur; there are cases in which anal suppositories containing contact-type excitants such as resorcinol or ethylaminobenzoate or tars produced generalized eruptions of the skin but no irritation of the anal or rectal mucosa; there are cases in which eye drops containing procaine or atropine, and so on, produced no conjunctivitis but severe dermatitis of the skin of the eyelids and of the face; there are cases in which the allergenic excitants in vaginal tampons and in vaginal suppositories produced no reaction of the mucosa but contact-type dermatitis of the skin. I think we are forced to the conclusion that, while in isolated instances there may be a mucous membrane sensitivity associated with the eczematous sensitivity of the skin, in many other cases the mucous membranes are not sensitive to contact-type allergens. I should like to ask Dr. Jordon and Dr. Osborne whether they found that the phenanthrene derivatives of opium were more likely to cause reactions than the oxyquinoline derivatives.

DR. JAMES W. JORDON, Buffalo: I believe the sensitizing index of morphine is very difficult to determine because morphine is handled by relatively few individuals. The drug is handled chiefly by nurses, pharmacists and, to a lesser extent, by physicians. When we see an eczematous eruption on the hands in nurses, we think of a few things, among them solution of formaldehyde, rubber gloves, soaps and mercury bichloride, and, since the discovery of our first case, morphine. The suspicion of morphine as a cause of eczematous dermatitis in nurses led to the discovery of two additional cases. As far as patch tests are concerned, we had positive tests not only to phenanthrene derivatives but also to benzyloquinoline compounds. In the latter case the tests were not so strongly positive and there is some doubt in my mind whether there is not some contamination with a small amount of morphine. In our cases, at least, we believe that morphine was a responsible agent rather than the other opium derivatives.

EXCISION OF SCAPULA

REPORT OF CASE WITH EXCELLENT
FUNCTIONAL RESULT

EDWIN W. RYERSON, M.D.

CHICAGO

Complete excision of the scapula is performed so rarely that few reports of this procedure can be found in the medical literature. The only reference in recent years is an article by Wakeley,¹ of London. His patient was a young man whose right scapula was removed because of an osteogenic sarcoma. After the excision the trapezius muscle was sutured to the deltoid, and the functional result was very satisfactory.

Nearly all of the reported operations were done for sarcoma or for metastatic carcinoma, with a few scattered cases of necrosis due to injury or infection.

REPORT OF CASE

The following case is of interest for several reasons:

A man of 56 from a neighboring state entered St. Luke's Hospital, Chicago, June 8, 1938, complaining of pain and swelling in the right shoulder. Six years previously he had undergone the resection of several inches of his transverse colon for chronic obstruction, which was said to have been due to carcinoma of the hepatic flexure. He made a rapid recovery from this operation and enjoyed perfect health for the next four years, but in 1936 he began to notice some vague distress in the abdomen, and his appetite was not very good. He continued to work, however, until August 1937, when his right upper arm became painful, and the pain gradually grew worse. His local physician treated him for neuritis with intravenous injections, but the pain persisted, and in May 1938, a month before the trip to Chicago, the shoulder became swollen in the region of the scapula. This swelling was not particularly tender to pressure, but the outer side of the arm was so painful that the patient had to take sedatives three times a day. He was thin and pale, with blood pressure of 108 systolic and



Fig. 1.—Dense osteoplastic tumor of scapula.

78 diastolic. There was no enlargement of any of the lymphatic glands in the neck, axilla or inguinal regions. A long scar occupied the upper portion of the abdomen. The liver dulness extended below the navel about a finger's breadth, but the lower edge and surface were smooth and not sensitive to pressure. The spleen and kidneys were not palpable.

The right scapula was much enlarged, with a domelike appearance, but the skin was smooth and not adherent, with

none of the venous engorgement so often seen in sarcomas. Movement at the shoulder joint was much restricted in all directions and caused pain which radiated down the arm as far as the elbow. The tumor occupied all of the region below the spine of the scapula and seemed to extend upward above this level to the upper angle. It was firm and nonfluctuant and was not particularly tender to pressure. The scapula was not adherent to the chest wall, but its excursions were distinctly limited.

X-ray examination by Dr. Hollis E. Potter showed a dense enlargement of the body of the scapula, with a possible involve-

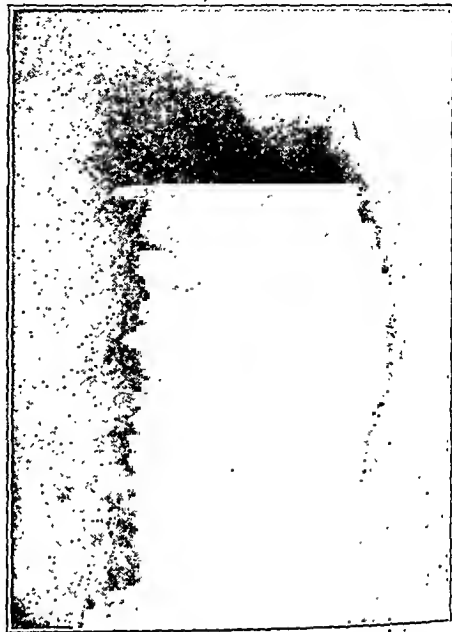


Fig. 2.—Radiating striations suggestive of osteogenic sarcoma.

ment of the coracoid process. The lateral view showed the radiating striations commonly seen in osteogenic sarcomas. Fluoroscopic examination of the chest by Dr. Potter did not reveal any evidence of metastatic lesions in the lungs, but several calcified lymphatic glands were visible in the thorax.

In considering the diagnosis, the history of a malignant obstruction in the hepatic flexure was highly suggestive, but the patient had been in perfect health for four years after the colonic resection and had had only vague symptoms in the abdomen after that time. The x-ray appearances suggested a new growth of solid consistency and uniform texture, with none of the spotty areas commonly seen in carcinomatous metastases in the flat bones. The lesion was evidently malignant, and the patient was beyond the age when sarcoma is generally encountered, but the x-ray appearance certainly resembled an osteogenic sarcoma.

I considered the advisability of an interscapular-thoracic amputation, but the patient was unwilling to have this. He consented to the excision of the scapula, however, and on June 9 he was anesthetized with nitrous oxide and oxygen. An incision was made from the acromion and carried medially along the spine of the scapula to its inner border and then downward to the lower angle. The flap was retracted and the acromioclavicular joint was separated. The trapezius muscle was then divided and the deltoid pushed upward. The medial and lower borders of the scapula were freed by sharp dissection, the insertion of the serratus magnus muscle. The tendons of the supraspinatus and infraspinatus, the teres minor, the subscapularis and the long head of the biceps were next divided, but it was difficult to separate the coracoid process from its attachments. The capsule was cut with curved scissors, and after the remaining muscles had been divided the scapula could be lifted up without further difficulty.

There was considerable bleeding during the operation, especially from the suprascapular artery. Two chromic catgut sutures were passed through the greater tuberosity and three

Read before the Section on Orthopedic Surgery at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.
1. Wakeley, Cecil P. G.: *Brit. J. Surg.* 26: 439 (Oct.) 1938.

the clavicle, holding the humerus up in fairly good position. The deltoid was loosely sewed to the trapezius, and the skin was sutured with silkworm gut. No drains were inserted.

A blood transfusion was given, as the patient was beginning to show considerable shock. A Velpeau bandage was applied.

The wound healed by first intention. Ten days after the operation about 3 ounces (90 cc.) of blood was aspirated from the lower angle of the incision. There was little discomfort after the first two days, and the former severe pain disappeared entirely.

The laboratory reported that the tumor was a metastatic glandular carcinoma. Radiating from the original site of the scapular bone were many linear spicules of bone between which were soft gray regions. Histologically there was a basic structure of necrotic bone trabeculae that enclosed marrow spaces filled with granulation and fibrous tissues. The fibrous tissue was extensively invaded by epithelium. The glandular structure resembled that seen in a carcinoma of the colon.

Within three weeks after operation the patient was able to move his arm freely through a range of about 20 degrees

ture on bone metastases from carcinoma in various organs, it is evident that metastasis to the scapula is relatively uncommon. Ghormley and Valls² report one such case in forty-three cases of gastrointestinal carcinoma with bone metastases and state that the incidence

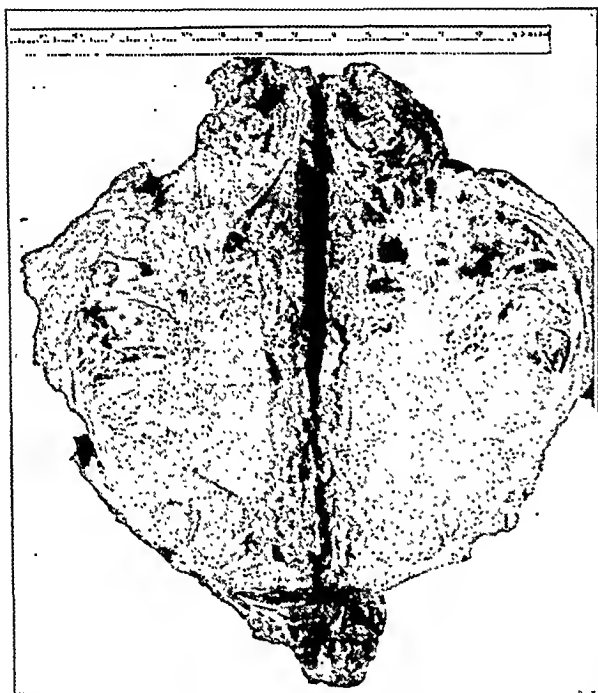


Fig. 3.—Tumor and scapula divided sagittally and spread open.

in all directions. He used the arm in feeding himself and in writing, and he considered that he was greatly benefited by the operation. The former severe pain had entirely disappeared, and he was able to sleep well without any of the sedatives which he had for months been compelled to take. The humerus remained in close apposition to the clavicle, and the deformity was not particularly noticeable. He returned to his home a few days later, and no further pictures were taken, although he came back to the hospital several times for roentgen therapy over the abdomen. He used his arm surprisingly well. The abdominal mass gradually increased in size, and digestive disturbances began to appear. In a few months the opposite shoulder became painful, but no metastasis to the scapula could be discovered. From this time his condition became worse, and by March 1939 he was practically bedridden.

His attending physician reported that on April 8 death occurred from generalized carcinomatosis and that postmortem examination had not been permitted by his family.

Here, then, is a metastatic carcinoma of the scapula, developing five and a half years after the resection of a portion of the colon, with an interval of perfect health lasting four years and with a picture resembling an osteogenic sarcoma. From a survey of the recent litera-



Fig. 4.—One month after excision of entire scapula. Note good approximation and range of active abduction.

of all bone metastases in such cases is from 0.2 to 0.5 per cent, with the highest rate for cancer of the rectum.

Geschickter and Maseritz³ report 356 bone metastases in 5,739 cases of carcinoma of various organs. In five of these 356 cases the scapula was involved.

Probably if I had been certain that the scapular condition was due to metastatic carcinoma the operation



Fig. 5.—One month after operation.

might not have been performed, but the relief from the unbearable pain was so great that it seems to have been justified. The injection of alcohol around the scapula might have given some relief and would perhaps be worth trying in a similar case.

122 South Michigan Avenue.

2. Ghormley, R. K., and Valls, J. E.: *J. Bone & Joint Surg.* 21: 74 (Jan.) 1939.

3. Geschickter, C. F., and Maseritz, I. H.: *J. Bone & Joint Surg.* 21: 314 (April) 1939.

ABSTRACT OF DISCUSSION

DR. W. B. CARRELL, Dallas, Texas: I observed a patient 40 years old with a tumor of the scapula from childhood, evidently an osteochondroma. During the past four or five years there had been definite increase in growth, although no special discomfort with the arm. He came in principally because of the massive tumor on the shoulder and the inconvenience it caused. The case was one of a definite osteochondroma with sharp detail, and nowhere could I find any evidence of a malignant condition. Believing that this was benign, I attempted to preserve as much function as possible and to save the acromion and a part of the coracoid with the glenoid. I believed that I could save the acromion and perhaps gain stability for the shoulder joint later. At the operation it was found when I had gotten in under the tumor that there was a fairly good section of the glenoid and coracoid process, which I was able to leave. As a result I obtained not only good function but excellent stability of the shoulder. The trapezius and the deltoid muscles were left attached. This patient has excellent function, good general position and practically all the motions of the shoulder joint. It is important in excision of the shoulder to preserve the mechanism of attachment of the trapezius and of the deltoid from below so that one gets not only satisfactory position but also stability.

DR. J. ALBERT KEY, St. Louis: I believe that had this patient of Dr. Ryerson's lived and had an opportunity to develop a pseudarthrosis around the head of the humerus he would have had considerable abduction and considerable strength in that

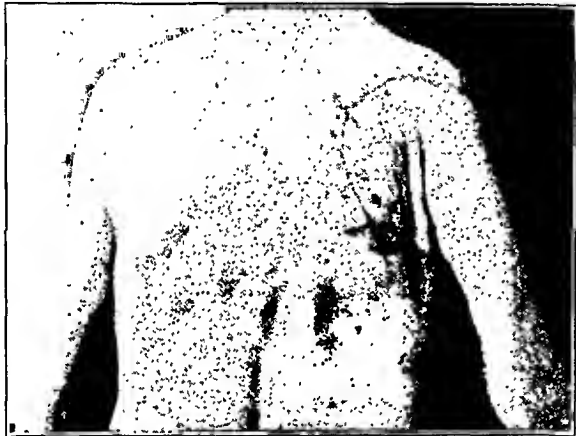


Fig. 6.—Active abduction one month after operation.

shoulder. I have seen one patient with a total excision of the clavicle. She had very little deformity, the shoulder did not drop as would be expected, she had good abduction, and she returned within about two months to regular duty as a trained nurse and has been doing it ever since. Sometimes it is amazing what good results can be obtained after removal of what one customarily thinks of as an extremely important bone. With no clavicle at all, this woman can get her arm up and do her hair.

DR. EDWIN W. RYERSON, Chicago: There are several people in Chicago who were born without any clavicles and they can do a fair day's work. Of course, their shoulders are narrow and the heads of the humeri are in a forward position. A few weeks ago an elderly woman came into my office who twenty-three years ago had a real sarcoma of the clavicle in the middle portion of it, and I excised all except the two ends of the clavicle and put in a bone graft from her tibia. I lost track of her and had not seen her for at least twenty years until she came into my office the other day. She is working in a neighboring town as a beauty specialist, and she says that she can do all the facial work that women require and do it without much difficulty except that her arm gets tired. A fairly good clavicle resulted from the bone graft. I am surprised that Dr. Key did not put a bone graft in that clavicle, although he says he really did not need to.

Clinical Notes, Suggestions and New Instruments

INTERMITTENT OBSTRUCTION OF THE SUBCLAVIAN VEIN

CHARLES W. McLAUGHLIN JR., M.D., AND A. M. POPMA, M.D., OMAHA

Intermittent obstruction of the subclavian vein is very uncommon. Venous obstruction is rarely a factor in cases of cervical rib with arterial compression and associated paresthesias. Swelling of the arm following radical mastectomy is frequently seen as a result of venous or lymphatic obstruction, but it is usually constant, permanent and due to scar tissue or recurrent malignant growth. Matas¹ recently reviewed the subject of primary thrombosis of the axillary vein following strain. Marked swelling of the involved extremity is usual in this condition, but with its development a firm tender thrombosed axillary vein is always associated.

The following report represents an instance of intermittent obstruction of the right subclavian vein developing in a healthy young man and persisting for two years. The absence of any history of trauma or venous thrombosis at the onset of the illness, together with the operative observations and the clinical result following section of the scalenus anticus muscle, warrant presentation of the case in some detail.

REPORT OF CASE

C. M., a farmer aged 24, married, entered the University Hospital, Omaha, for the first time on Feb. 2, 1938. He complained of intermittent swelling and cyanosis of the entire right upper extremity following exertion for the past two years.

The family history was essentially negative except that the patient's father died at the age of 58 with diabetes mellitus. There was no history of tuberculosis, syphilis or heart disease in the family. The patient had been married four years. There were two children living and well. The wife had had no miscarriages.

Prior to the onset of the present illness the patient had enjoyed excellent health and carried out all his duties as a farmer. Eight years previously both bones of the right forearm had been fractured and reduced without x-ray studies. Healing was normal, and there was no residual deformity or weakness. There were no other injuries or operations except a minor procedure which will be mentioned.

Two years before admission while doing heavy work the patient for the first time noted that his right hand, forearm and arm became swollen and blue. This condition appeared suddenly and without any inciting cause and subsided after a few moments of rest. In the succeeding months these attacks of swelling with cyanosis recurred on the average of twice a day, although when the arm was unusually active the swelling persisted most of the day. It would always disappear at night or on rest of the extremity.

A typical attack could be precipitated in about five minutes if the patient chopped wood, drove nails or did similar work. He would then note that the hand, forearm and arm became rapidly swollen, with the skin tense and the entire extremity increased in size. Pain of a severe aching type would develop in the entire arm and demand immediate rest. The entire extremity became blue and definitely cooler than its fellow, and the superficial veins of the hand, forearm, arm and pectoral region would become distended and prominent. This distention of the veins was seen to extend up into the right cervical region on occasions. If the arm was permitted to rest at the side it would lose its blue color and assume a normal size in from ten to fifteen minutes.

One year before entry the patient consulted a physician, who incised the arm over the anterior surface of the biceps muscle. It was reported that a ganglion was removed at this time, although no improvement in the general condition followed the

From the Departments of Surgery and Radiology, University of Nebraska College of Medicine.
1. Matas, Rudolph: Primary Thrombosis of the Axillary Vein Caused by Strain, *Am. J. Surg.* 24: 642-667 (June) 1934.

operation. In recent months the entire extremity and shoulder region had become sore and painful after being swollen intermittently during the day, interfering with the patient's rest. The local application of heat did not benefit these symptoms.

There had been no loss of strength or sensory changes and no associated numbness or tingling while the arm was swollen. The major complaints were a full tight feeling during the period of swelling, associated with intense pain of a muscle fatigue type, and a throbbing sensation followed by intense aching which would persist for some hours.

There was nothing else of import in the systemic history that had any bearing on the present illness.

The patient was powerfully built and well nourished, appeared to be in excellent health and had no complaints other than those already noted.

The skull showed no abnormality and the pupils were round and equal, responding to light and to accommodation. The sclera was normal. The ears and nose were normal. The teeth were in good repair, the tongue was clean and the tonsils were small and atrophic. The thyroid was not palpable. A few small submaxillary and submental glands were palpable. Careful palpation of both cervical regions gave no suggestion of a cervical rib.

The heart was not enlarged, the sounds were of good quality and regular and the pulse rate was 72 per minute; there were no murmurs. The blood pressure was 120 systolic and 76 diastolic in the right arm and 110/70 in the left when the

showed that the pulsations on the two sides were present and grossly equal. After five minutes of active exercise, including flexion and extension of the forearm, and abduction and adduction of the arm, the right upper extremity became definitely enlarged, appearing to be approximately one third larger than the left (fig. 1). The superficial veins on the dorsum of the



Fig. 2.—Appearance at the completion of injection of 4 cc. of colloidal thorium dioxide. The vein is grossly dilated and appears narrowed where it crosses the first rib.

hand, the forearm, arm and the right pectoral region became distended and prominent, and the veins in the right cervical region were noticeably enlarged. The entire extremity became dusky blue and cold to touch. During this time the patient complained of intense muscle fatigue incident to the exercise, and a definite diminution in the muscle power of the extremity was seen to develop. After ten minutes' rest the arm had returned to approximately normal size, the veins again became collapsed and the color returned to normal. The muscle power and grip at this time were essentially normal on both sides.

TABLE 1.—Blood Pressure Determinations

	Right		Left	
	Systolic	Diastolic	Systolic	Diastolic
First.....	120	60	106	60
Second.....	124	60	112	65
Third.....	124	55	112	55
Fourth.....	126	60	115	62
Fifth.....	124	64	112	60

The clinical impression was that this patient presented an example of a vascular obstruction on the venous side in the right cervical region, probably at the point where the subclavian vein crossed the first rib. Special investigative procedures were then outlined and carried out in an effort to confirm this impression more definitely.

Blood study showed 88 per cent hemoglobin, 4,850,000 red cells and 7,600 white cells, with 57 per cent polymorphonuclears, 31 per cent lymphocytes, 9 per cent staff cells and 3 per cent monocytes. The urine was amber, with specific gravity of 1.020, and acid reaction. It contained no sugar, no albumin and an occasional white blood cell. Serum Kahn and Kline tests were negative.

The right upper arm measured 12½ inches before exercise and 13½ inches after exercise. The right lower arm measured 11½ inches before exercise and 12½ inches after exercise. Repeated blood pressure determinations were then made on both arms at one minute intervals with two sphygmomanometers and the pressure in the two arms was recorded simultaneously (table 1).

It was observed that the pressure on the right side remained consistently at a higher level than on the left.

Skin temperature studies were carried out at rest under basal conditions after vasodilatation had been induced by immersing the lower extremities in water at 43 C. (109.4 F.) for twenty

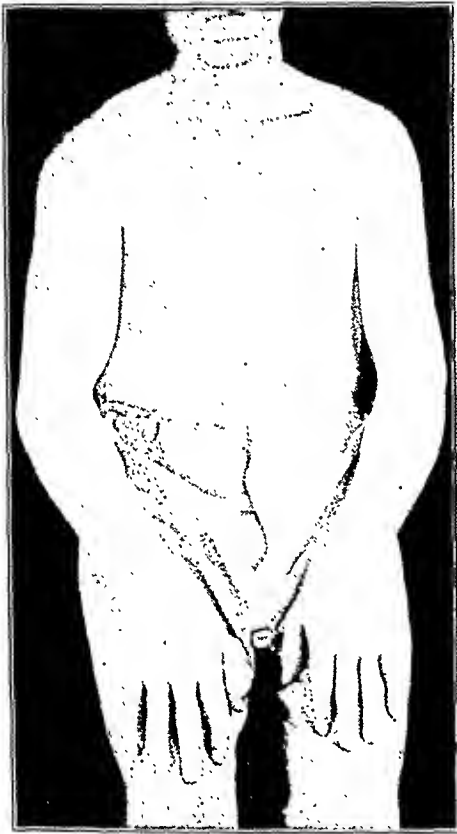


Fig. 1.—Appearance of patient five minutes after moderate enlargement of the right arm. The gross enlargement of the arm is readily seen.

extremities were hanging at the side. The chest was clear to percussion and auscultation. The abdomen was normal. The reflexes in all the extremities were normal.

Examination of the two upper extremities disclosed that the right arm was somewhat better developed and more muscular than the left, and the superficial veins on the right side were slightly more prominent while in the position of rest. The entire right upper extremity appeared to be slightly larger than the left. The skin was smooth and elastic, and there was no pitting edema. Palpation of the radial, brachial and axillary arteries

minutes. Readings were also made after active exercise sufficient to produce swelling of the right arm.

This investigation demonstrated a satisfactory skin temperature response in both upper extremities following the release of all vasoconstricting influence. However, readings taken at the same points after exercise demonstrated a marked drop in the skin temperature readings of the right hand, which was in keeping with the clinical observations.

Histamine studies done by the intracutaneous method showed a satisfactory wheal and flare at all levels on both sides.

A study of the venous pressures in the veins of the upper extremities was carried out by Dr. A. L. Bennett of the department of physiology and Dr. Ross MacIntyre of the department of pharmacology. An attempt was made to record venous pres-

TABLE 2.—Skin Temperature

	Mldarm	Midforearm	Dorsum of Hand
Right upper extremity, F.			
Before exercise.....	79.7	85.8	84.6
After peripheral vasodilatation..	82.8	85.2	87.8
After exercise.....	89.0	86.2	79.0
Left upper extremity, F.			
Before exercise.....	85	86	84.0
After peripheral vasodilatation..	86	86	85.2
After exercise.....	84	88	91.0

sure in the median basilic vein of each arm during the time of forceful rapid gripping of the hand. The patient, however, was unable to produce the typical swelling of the right arm by such limited movements of the hand muscles with the needles in place, and the results obtained from these studies were inconclusive.

X-ray studies revealed that the chest and cervical spine were essentially normal and the mediastinum was clear. The lower end of the right radius showed some cortical thickening at the site of the old fracture, about 4 cm. proximal to the wrist joint.

An anteroposterior study of the right shoulder showed no evidence of pathologic change in bone or soft tissue. There was no evidence of cervical rib.

A film of the right shoulder exposed after the injection of 4 cc. of colloidal thorium dioxide into the median cubital veins showed the cephalic vein to be well visualized to the point of its entrance through the costocoracoid membrane into the axil-

upward to the first rib (figs. 2 and 3). This indicated that the obstruction was intermittent and not the result of thrombophlebitis. There appeared to be a zone of narrowing where the vessel crossed the first rib. The cephalic vein was not visualized at this time. In summary, the right axillary vein, 6 to 18 mm. in diameter, was well visualized to the level of the first rib, with relative narrowing where it crossed the first rib.

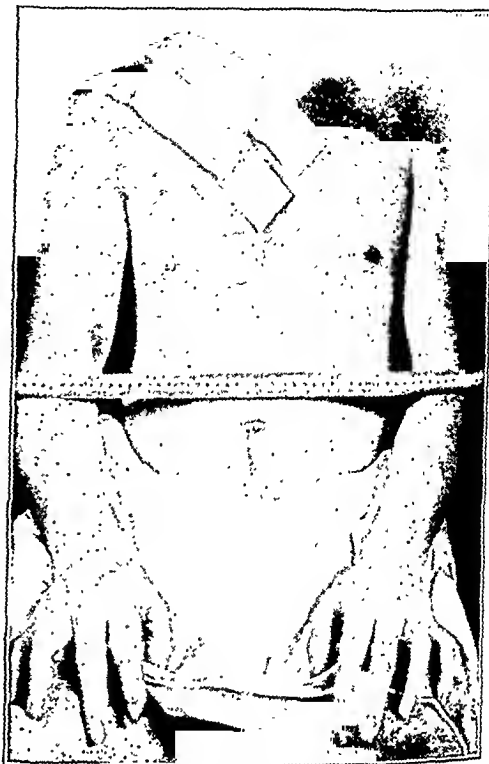


Fig. 4.—Condition ten days after operation. The arm was exercised vigorously for fifteen minutes prior to the taking of the photograph. The right arm remained slightly larger than the left, but there was no swelling and no pain.

On the clinical assumption of partial or intermittent obstruction of the axillary vein at the point where it crossed the first rib, surgical intervention was decided on and carried out on March 2.

Cyclopropane anesthesia was administered. The procedure was exploration of the right subclavian triangle and scalenotomy on the right.

An incision 8 cm. in length was made above and parallel to the right clavicle. The platysma was severed and on blunt dissection a large vein measuring at least 1 cm. in diameter became apparent in the base of the wound. From its rather superficial position it was felt that this could not be the subclavian. On further dissection it was seen that the external jugular vein emptied into it and that farther down it joined with the internal jugular vein, which identified it definitely as the subclavian vein. Just distal to the point where it crossed the first rib the vein was seen to be definitely dilated, being at least 2 cm. in diameter. As it crossed the rib it became much narrower, but no definite mechanical obstruction was demonstrable at this point. The vein seemed rather to be somewhat stretched over the first rib at its point of crossing. There was no thickening in the venous wall in this area to suggest the existence of an old thrombosis, nor was there any evidence of old blood pigment about the vein. The subclavian artery was in its normal position and showed no gross lesion. On the assumption that the first rib in its rather high position might possibly be producing a partial mechanical obstruction or venous spasm of the subclavian vein, it was decided to permit the rib to assume a lower position by section of the scalenus anticus muscle. This was done after carefully freeing and separating the phrenic nerve. After section of the muscle the rib was seen to slip downward, allowing the subclavian artery to assume a more anterior position on the first rib and permitting the vein to cross the superior surface of the rib without any evidence

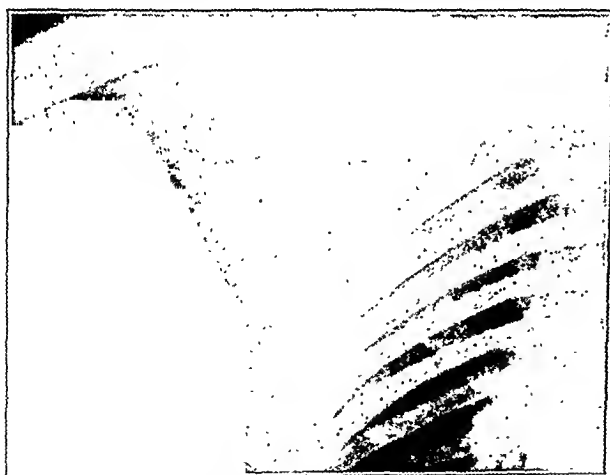


Fig. 3.—A second exposure, made sixty seconds after the completion of the injection of colloidal thorium dioxide, shows the vein less well filled with the opaque medium although the same degree of dilatation exists. Roentgenograms made postoperatively three seconds after injection of 10 cc. of diodrast showed none of the contrast medium to be present in the vein.

lary vein. Further study made after injection of the basilic vein showed it to be visualized to slightly above the point where it pierces the deep fascia, about 1 inch below the axillary fold. These observations suggested partial occlusion of the axillary vein, possibly due to thrombophlebitis.

Further studies of the axillary vein showed it to be well visualized from the level where previous visualization stopped

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1963

tension. The dilatation in the vein distal to the first rib was much less apparent at the end of the procedure. The neck was closed in layers with one small wick for drainage. The postoperative course was uneventful, and the patient was permitted out of bed on the fifth day after operation. The wound healed by primary union. Ten days after operation the patient was asked again to carry out exercise that formerly produced the swelling of the arm. Repeated attempts were unsuccessful in producing any of the phenomena so typically seen before operation (fig. 4). After operation the arms below the elbow measured $11\frac{1}{2}$ inches before exercise and $11\frac{1}{2}$ inches after exercise. The midarms measured $12\frac{1}{2}$ inches before exercise and $12\frac{1}{2}$ inches after exercise.

A check-up venogram was made in the department of radiology. Further studies of the axillary vein after the intravenous injection of 10 cc. of diodrast showed the vein to be essentially normal in size and position at the completion of the injection. Three seconds after injection of the diodrast, none of the opaque medium remained visualized within the vein. Subjectively the patient said he felt entirely different and had none of the old sensations present in the arm before operation. He was dismissed to return to his work on the farm with instructions to report in three months for follow-up.

On June 20, four months after operation, the patient's right arm was practically normal again. He was experiencing no discomfort and, except for slight weakness on the affected side, he could see no difference in the two arms. On June 1, 1939, sixteen months after scalenotomy was undertaken, the patient was entirely well. The arms were equal in size, full strength had returned, and he was doing heavy work each day with no complaints.

COMMENT

The obstruction demonstrated radiologically by injection of colloidal thorium dioxide was seen to be at the point where the subclavian vein crossed the first rib. This procedure was carried out with the technic of Veal² and was of definite diagnostic value since the positive results of x-ray examination entirely supported the clinical observations.

In considering the possible etiologic factors in this case before operation, primary thrombosis of the subclavian vein was seriously considered. Mats¹ pointed out that the condition may occur idiopathically or after minor degrees of strain. It occurs four times as often in males as in females, and the right arm is affected two and a half times as often as the left. It has been suggested that the subclavius muscle is an important factor in the production of this lesion, trauma and overstretching resulting in rupture of the subclavio-axillary valve which lies beneath the muscle, with the subsequent development of thrombosis.

Venospasm has also been recently suggested as an accessory agent, with the thrombosis resultant from persistent irritation of inflamed or injured perivenous plexuses in the venous wall. Veal and McFetridge³ have recently shown by venograms that primary venous thromboses in this region usually develop in the axillary vein below the head of the humerus and against the subscapularis muscle, not over the first rib and beneath the subclavius muscle as previously suggested.

Prior to surgical exploration, cervical rib had been excluded from consideration and the clinical diagnosis was subclavian vein obstruction, mechanical, due to spasm or resultant from an old venous thrombosis. At operation there was no thickening of the vein wall where it crossed the first rib and the appearance was not that of an old resolving thrombosis. The absence of scar tissue or blood pigment in the root of the neck which might be responsible for the obstruction. The improvement following section of the scalenus anticus muscle was so prompt and dramatic that there can be little doubt that this structure was an important factor in the production of the clinical picture. Normal emptying of the vein visualized by injection following operation confirmed this impression.

² Veal, J. R.: Direct Visualization of the Axillary and Subclavian Veins, *Radiology* 31: 183 (Aug.) 1938.
³ Veal, J. R., and McFetridge, E. M.: Primary Thrombosis of the Axillary Vein, *Arch. Surg.* 51: 271 (Aug.) 1935.

In view of the operative observations, no positive explanation can be offered for the rather sudden development of the clinical syndrome in this case. The relatively high position of the first rib together with a well developed scalenus anticus muscle suggests that pressure was exerted on the subclavian vein during effort. This resulted in the picture of intermittent venous obstruction which appeared with exercise or muscular activity.

CONCLUSION

In a case of intermittent obstruction of the subclavian vein appearing with exercise, it is suggested that mechanical pressure of the first rib on the vein during activity was responsible for the syndrome, since prompt and permanent cure followed section of the scalenus anticus muscle.

A NEW INSTRUMENT FOR USE IN ESOPHAGOSPASM

DONOVAN C. BROWNE, M.D., AND GORDON McHARDY, M.D.
NEW ORLEANS

Bougienage of one variety or another has been practiced for more than fifty years in relieving dysphagia due to cardiospasm. A discussion of the various diagnostic terms applied to this type of pathologic condition of the esophagus such as achalasia, phrenospasm, hiatal esophagismus, megalo esophagus

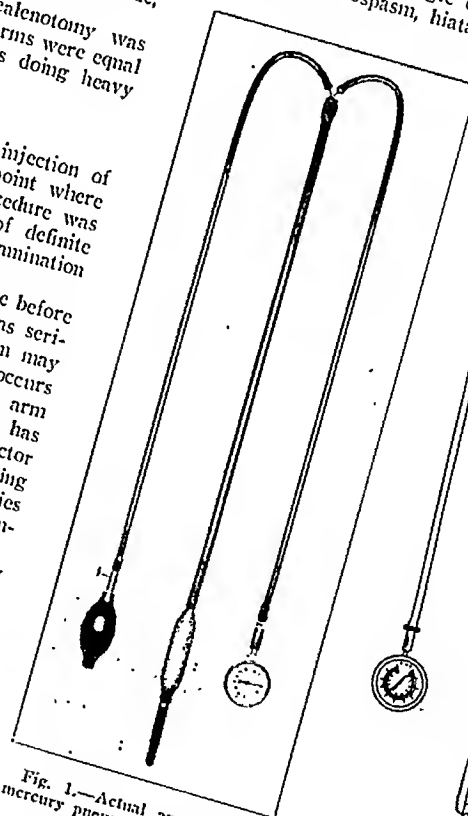


Fig. 1.—Actual appearance of mercury pneumatic dilator.

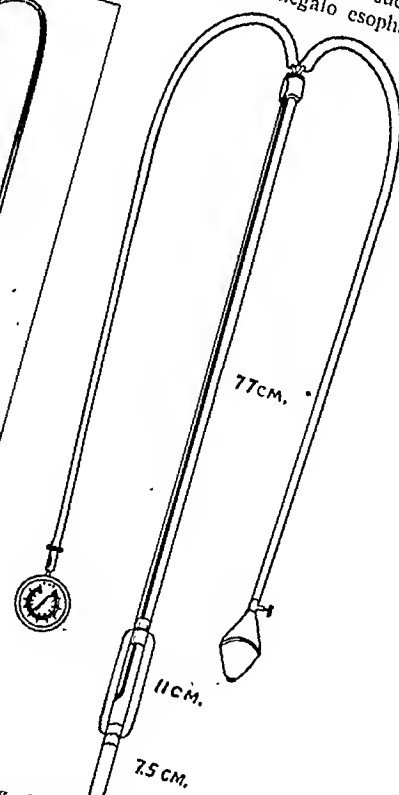


Fig. 2.—Artist's sketch of mercury pneumatic dilator.

or idiopathic esophageal dilatation is not pertinent to this paper. The success of this form of therapy and the increasing frequency of diagnosis render our introduction of a most satisfactory combined dilator and divulsor an important item for publication. In a review of the history of dilators adequate mention must be given semistiff fiber bougies and mechanical divulsors inserted through the esophagoscope. Their use necessarily involves a semioperative procedure and they are more applicable in cases in which scarring or fibrous stricturing exists. Sippy's graduated olives, and those of others, in various sizes and

From the Department of Medicine, Tulane University of Louisiana School of Medicine, and the Gastroenterology Clinic, Toussaint Infirmary, George P. Pilling & Son Company, Philadelphia, makers of this instrument, cooperated with the authors in working out the problems of construction.

shapes attached to a fiber and guided by a swallowed thread, are introduced fearlessly by persistent adherents. They are probably safest in expert hands. We have seen under the fluoroscope an apparently taut cord loosen, the bougie fail to engage the cardia and pass blindly into a dilated esophageal pouch. Because of this as well as of other obvious limitations, they must be reserved for the expert endoscopist.

Retrograde dilation with Tucker's instrument and divulsion manually or by forceps from the gastric side are major surgical procedures reserved for those few instances in which adequate indications exist.

Hurst introduced his mercury filled bougies in 1913. They are rubber tubes varying in diameter (from 21 to 40 English), 31 inches long and each containing the same quantity of mercury (21 ounces). These are carried and guided through the esophagus by their weight, opening a passageway by their size.

These dilators, in our experience, are the easiest passed; they cause less discomfort and are unquestionably the safest instruments available in properly indicated cases. Successively larger tubes are passed at a single sitting, and in most instances the largest one meets with only slightly more resistance than the smallest.

Additional factors in the use of these bougies include the following: 1. In the instance of narrowing at sites, in addition to that at the cardia, all are dilated to the same extent by the one passage. 2. Patients have been taught to use the bougies in selected instances. 3. No fatality has been recorded from the use of this procedure. 4. It is obvious that these bougies have limitations and are best employed when the cardiac opening remains dependent and the existing pathologic condition has not brought about a great sacculatation at a level below the hiatus, although we have employed them quite successfully in severe cases. 5. The large size, No. 40, often proves annoying to patients because of the bulk in the pharynx.

The history of the bag divulsion dates back to J. C. Russel's work of 1898. In 1906 at the Mayo Clinic Plummer modified



Fig. 3.—Dilator introduced into stomach; irregularity in outline as marked by arrow represents the metallic ring at each extreme of the pneumatic bag.

It requires a source of running water and is not portable and for this reason is not as practical as could be wished. Failure to place the dilator, unsatisfactory results due to improper technique, considerable pain and a mortality percentage are admitted; however, it has a definite advantage in that divulsion is achieved by its use.

In 1929 Frank Smithies designed the pneumatic dilator modification of Plummer's apparatus in an effort to remedy proved limitation of the latter divulsor. Smithies' dilator, being portable, requiring no special water supply, being devoid of whalebone staff but having a metal shaft with safety control, and being of inexpensive construction, was a notable achievement.

It rendered fluoroscopic control of divulsion dilation practical. Its only essential distinction from the Plummer dilator, however, is that it is pneumatic.

Ten years has passed since Smithies' pneumatic bougie was introduced and there has been no further notable advance in instruments. There have been minor modifications of the pneumatic bougie and advocates of a barium bag, but none of these have been of great value. Prior to perfecting the combine



Fig. 4.—Dilator in place and distended with air. Arrow is at margin of pneumatic bag, which is faintly outlined.

apparatus which we now introduce we use equipment similar to Smithies', eliminating the objectionable steel shaft, thus increasing the safety factor but still having to resort to a swallowed thread for reassurance and guidance in most instances. In September 1938 work was started on the instrument which we now present, and the final plans and specifications were forwarded to George P. Pilling & Son Company in January 1939.

This new dilator and divulsor combines the principles of Hurst, Plummer and Smithies and achieves a position of maximal efficiency and safety.

It is a number 21 Hurst mercury tube; on the distal end, 7.5 cm. from the tip, has been incorporated a rubber covered silk bag 11 cm. in length to which a small catheter runs through the mercury filled tube. By this means distention, under the control of a sphygmomanometer, may be effected.

The distinct advantages of this instrument are that: 1. A swallowed guiding thread is not required; it is easily passed, being the size of the small Hurst dilator. It is carried through by virtue of its contained 21 ounces of mercury, which is sufficient to force the closed sphincter and which is in itself a guide but which is not sufficiently forceful to traumatize or perforate the esophagus. 2. This type dilator is most easily passed with less discomfort than any other type and does not show any tendency to coil in a dilated prediaphragmatic dilatation, as might be suggested by some. 3. Only a single instrumentation is required, as contrasted to the passing of an olive prior to the use of a Plummer dilator and the use of graduated Hurst bougies. 4. It offers controlled pneumatic divulsion, which is more practical and safer than hydrostatic dilation, and this in combination with the bougie qualifications of the Hurst dilator. 5. It is applicable to x-ray examination as is illustrated here.

This dilator is not presented with the idea that it is applicable in all instances, any more than other instruments may meet all emergencies, but rather that it fills a need most frequently encountered.

1520 Aline Street.

Number of Persons Infected by One Mosquito.—It is important to know whether an *Anopheles* once infected (with malaria) can infect more than one person without again feeding on infective blood. . . . In a most instructive series of experiments conducted by Mayne he reports that one mosquito proved to be the sole infecting agent in three cases. *Mitzman* used *Anopheles punctipennis* (Say) with *Plasmodium vivax*. He also demonstrated in eleven experiments that short exposure to bites was sufficient to cause successful transmission of the disease.—Hermes, William B.: *Medical Entomology*, New York: Macmillan Company, 1939.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

HEINZ STRAINED PEARS AND PINEAPPLE

Manufacturer.—H. J. Heinz Company, Pittsburgh.

Description.—Canned strained mixture of pears and pineapple.

Manufacture.—Fresh pears are sorted, peeled by mechanical peelers, by scalding, or by hand peeling. The peeled pears are cored, trimmed, washed and precooked with direct steam under light pressure. Definite proportions of canned or fresh crushed pineapple are added and the mixture is strained in an atmosphere of steam, filled into enamel-lined cans, vacuum sealed and heat processed.

Analysis (submitted by manufacturer).—Moisture 84.9%, total solids 15.1%, ash 0.4%, salt 0.05%, protein ($N \times 6.25$) 0.4%, fat (ether extract) 0.04%, crude fiber 1.0%, total carbohydrate other than crude fiber (by difference) 12.9%, sucrose (Munson and Walker Method) 10.1%, starch (by difference) 2.8%, acidity as citric 0.37%.

Calories.—0.54 per gram; 15.3 per ounce.

Vitamins.—Protocols of biologic assay submitted by the manufacturer indicate that Heinz Strained Pears and Pineapple has the following approximate vitamin content:

Vitamin A, 1.7 U. S. P. units per gram; 50 per ounce.

Vitamin B₁ (thiamin), 0.24 international unit per gram; 7 per ounce (equivalent to 0.21 mg. of thiamin per ounce).

Vitamin G (riboflavin), 0.17 Sherman-Bourquin unit per gram; 5 per ounce.

It is further reported that the product contains 0.03 mg. of ascorbic acid per gram, 0.85 per ounce (equivalent to 0.6 international unit of vitamin C per gram, 17 per ounce) as determined by chemical titration.

TURKEY BRAND GOLDEN SYRUP

Manufacturer.—J. Stromeyer Company, Philadelphia.

Description.—Corn syrup flavored with refiners' syrup.

Manufacture.—Formula proportions of the two ingredients are blended and packed in tins.

Analysis (submitted by manufacturer).—Moisture 22.6%, total solids 77.4%, ash 1.2%, fat (ether extract) 0.1%, protein ($N \times 6.25$) 0.2%, reducing sugars as invert sugar 32.4%, sucrose 9.7%, dextrin 28.3%, crude fiber none, carbohydrates (by difference) 75.9%, Baume 41°.

Calories.—3.05 per gram; 87 per ounce.

PRUDENCE BRAND ROAST BEEF HASH

Manufacturer.—Boston Food Products Company, Boston.

Description.—Canned roast beef hash prepared from cooked potatoes, roasted beef, roasted beef juices; seasoned with salt and pepper.

Manufacture.—Selected beef (boneless chucks, shoulders and rounds) U. S. Inspected and Passed by the Department of Agriculture, is cut in small pieces, sinew, bristle and excess fat are removed, and it is roasted until well done without the addition of water. Potatoes are mechanically peeled, trimmed, washed and cooked. Formula proportions of the ingredients are mixed, mechanically chopped and filled into cans, which are heated, sealed and heat processed. The product is manufactured under the supervision of the Bureau of Animal Industry.

Analysis (submitted by manufacturer).—Moisture 70.0%, total solids 30.0%, ash 2.4%, fat (ether extract) 6.4%, protein ($N \times 6.25$) 9.5%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 11.4%.

Calories.—1.41 per gram; 40 per ounce.

SAVERY-SAVORY BRAND MUSHROOMS, BUTTONS, SLICES, AND STEMS AND PIECES

Manufacturer.—The Great Western Mushroom Company, Denver.

Description.—Hothouse mushrooms, canned as buttons, slices and stems and pieces, slightly seasoned with salt.

Manufacture.—Mushrooms, grown under sterile conditions from mushroom spawn, are cultured on trays in a thin layer of moist rich top soil covering a mixture of dirt and manure in dark houses maintained at a constant temperature. The mushrooms are picked by hand, conveyed to the cannery, trimmed, and sorted by hand. Stems and buttons are graded mechanically and some mushrooms are sliced mechanically. The mushrooms are immersed in boiling water for five minutes, weighed into cans which are filled with hot water, salt is added, and the cans are sealed and heat processed.

Analyses (submitted by manufacturer).—

	Buttons, per cent	Slices, per cent	Stems and Pieces, per cent
Moisture	91.7	93.4	92.2
Total solids	8.3	6.6	7.8
Ash	1.6	1.5	1.6
Sodium chloride (NaCl)	0.9	1.1	1.2
Fat (ether extract)	0.2	0.2	0.2
Protein ($N \times 6.25$)	3.1	2.6	2.7
Crude fiber	0.7	0.7	2.9
Carbohydrate other than crude fiber (by difference)	2.7	1.6	0.4

Calories.—Buttons, 0.25 per gram; 7 per ounce.

Slices, 0.19 per gram; 5 per ounce.

Stems and pieces, 0.14 per gram; 4 per ounce.

(1) BRUCE'S JUICES BRAND ORANGE JUICE, UNSWEETENED

(2) BRUCE'S JUICES BRAND ORANGE JUICE, SUGAR ADDED

Manufacturer.—Bruce's Juices, Inc., Tampa, Fla.

Description.—(1) Canned, unsweetened orange juice.

(2) Canned orange juice with added cane sugar.

Manufacture.—(1) Sound, tree-ripened oranges are washed and mechanically cut in half and the juice is extracted by reamers operated by hand or mechanically. The juice is strained, deaerated, pasteurized and filled into cans. The cans are sealed and cooled.

(2) The juice is prepared and canned as described for Bruce's Juices Brand Orange Juice, Unsweetened. A small amount of sugar is added after the juice is strained.

Analyses (submitted by manufacturer).—(1) Moisture 87.5%, total solids 12.5%, ash 0.4%, fat (ether extract) 0.1%, protein ($N \times 6.25$) 0.4%, sucrose 1.9%, reducing sugar as invert 6.9%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 11.5%, titratable acidity as anhydrous citric acid 1.2%, vitamin C 51.4 mg. per hundred cubic centimeters. (2) Moisture 84.6%, total solids 15.4%, ash 0.3%, fat (ether extract) 0.1%, protein ($N \times 6.25$) 0.4%, sucrose 5.0%, reducing sugar as invert 6.7%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 13.3%, titratable acidity as anhydrous citric acid 1.2%, vitamin C 50.3 mg. per hundred cubic centimeters.

WINDSOR BRAND EVAPORATED MILK

Manufacturer.—Windsor Evaporated Milk Company, Cleveland (an associate of the Telling-Belle Vernon Company, Cleveland, and subsidiary of the National Dairy Products Corporation).

Description.—Canned unsweetened evaporated milk.

Manufacture.—Selected milk is inspected, tested, preheated, evaporated under vacuum, homogenized, cooled, standardized to meet government requirements for butter fat and total solids, filled into cans, sealed and sterilized.

Analysis (submitted by manufacturer).—Moisture 73.7%, total solids 26.3%, ash 1.6%, fat (ether extract) 7.8%, protein ($N \times 6.38$) 6.9%, lactose (by difference) 10.0%.

Calories.—1.38 per gram; 39 per ounce.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 25, 1939

The Platform of the American Medical Association

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

In the various actions of the House of Delegates during the special session held in Chicago in September last year, and again at the meeting in St. Louis, certain constructive proposals were made which had the full approval of the House of Delegates. Now the Board of Trustees of the American Medical Association has formulated these concepts into a constructive platform for the American Medical Association. This platform is set up as a guide to indicate the trend which the American Medical Association believes should be followed in the development of health activities and medical care for the people of the United States.

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

Today the medical and health functions of the United States are divided among a multiplicity of departments, bureaus and federal agencies. Thus, the United States Public Health Service is in the Federal Security Agency; the Children's Bureau in the Department of Labor; the Food and Drug Administration in the Department of Agriculture; the Veterans' Administration and many other medical functions are separate bureaus of the government. The WPA, CCC and PWA are concerned with a similarity of efforts in the field of preventive medicine. The Federal Works Administration and the Federal Housing Administration also have some medical functions.

Since 1875 the American Medical Association has urged the establishment of a single agency in the federal government under which all such functions could be correlated in the interest of efficiency, the avoidance of duplication and a saving of vast sums of money. Such a federal health agency, with a secretary in the cabinet or a commission of five or seven members, including competent physicians, would be able to administer the medical and health affairs of the government with far more efficiency than is now done.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

The physicians of the United States have given freely of their time and of their funds for the care of the sick. Their contributions to free medical service amount to at least \$1,000,000 a day. The physicians of this country have urged that every person needing medical care be provided with such care. They have urged also the allotment of funds for campaigns against maternal mortality, against venereal disease and for the investigation and control of cancer. The medical profession

does not oppose appropriations by Congress of funds for medical purposes. It feels however that, in many instances, states have sought aid and appropriations for such functions without any actual need on the part of the state, in order to secure such federal funds as might be available. It has also been impossible, under present technics, to meet actual needs which might exist in certain states with low per capita incomes, with needs far beyond those of wealthier states, in which vast sums are spent.

It is proposed here simply that Congress make available such funds as can be made available for health purposes; that these funds be administered by the federal health agency, mentioned in the first plank of this platform, and that the funds be allotted on proof of actual need to the federal health agency, when that need is for the prevention of disease, for the promotion of health or for the care of the sick.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

Obviously if federal funds are made available to the individual states for the purposes mentioned in the second plank of this platform, there might well be a lessened tendency in many communities to devote the community's funds for the purpose and, in effect, to demand that the federal government take over the problem of the care of the sick. Hence it is suggested that communities do their utmost to meet such needs with funds locally available before bringing their need to the federal health agency, and that the federal health agency determine whether or not the community has done its utmost to meet such need before allotting federal funds for the purpose.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

The medical profession is not static. It wishes to extend preventive medical service to all the people within the funds available for such a purpose. Obviously, this will require not only a federal health agency which may make suggestions and initiate plans but also a mechanism in each community for the actual expansion of preventive medical service and for the proper expenditure of funds developed both locally and federally. In the development of new legislation, such mechanism may be suitably outlined.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

The medical profession does not yield to any other group in this country in its desire to extend medical

care to all those unable to provide themselves with medical service. The American Medical Association through its House of Delegates has already recognized the possible existence of a small group of persons able to provide themselves with the necessities of life commonly recognized as standard in their own communities but not capable of meeting a medical emergency. It is recognized, however, that only persons of the same community fully familiar with the circumstances can determine the number of people who come properly under such classification and that only persons in actual contact with such instances are capable of administering suitably and efficiently the medical care that may be required. Hence it is the platform of the American Medical Association that medical care be provided for the indigent and the medically indigent in every community but that local funds be first utilized and that local agencies determine the nature of the need and control the expenditure of such funds as may be developed either in the community or by the federal government.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

In the so-called National Health Program it is asserted that one half the counties of the United States are without suitable hospitals, and vast sums are requested for the building of new hospitals. In contrast, reputable agencies within the medical profession assert that there are only thirteen counties more than 30 miles removed from a suitable hospital and that in eight of those thirteen counties there are five persons per square mile. In the United States today the percentage of hospital beds per thousand of population is higher than that of any other comparable population in the world. This fact is completely ignored by those who would indulge in a program for the building of great numbers of new hospitals.

Moreover, it seems to be taken for granted that hospital building has languished in recent years, whereas considerable numbers of hospitals have been built with federal funds by various state agencies and also by the PWA, the WPA and the Federal Works Administration.

Analyses may indicate that in many instances such hospitals were built without adequate study as to the need which existed or as to the possible efficient functioning once it was erected. Moreover, there is evidence that in recent years many of the hospitals of the United States known as nonprofit voluntary hospitals have had a considerable lack of occupancy, owing no doubt to the financial situation in considerable part. It seems logical to suggest then that such federal funds as may be available be utilized in providing the needy sick with hospitalization in these well established existing institutions before any attempt is made to indulge in a vast

building program with new hospitals. In this point of view the American College of Surgeons, the American Hospital Association, the Catholic Hospital Association, the Protestant Hospital Association and practically every other interested voluntary body agree.

Again, it has been argued that the demands for medical care in some sections of the country might require the importation of considerable numbers of physicians or the transportation of numbers of physicians in the areas in which they now are to other areas. In this connection it would seem to be obvious that a change in the economic status of the communities concerned would result promptly in the presence of physicians who might be seeking locations. The utilization of existing qualified facilities would be far more economical than any attempt to develop new facilities.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

In the United States today our sickness and death rates are lower than those of any other great country in the world. This fact was recognized by the President of the United States when he sent the National Health Program to the Congress for careful study. The President emphasized that a low death rate may not mean much to a man who happens to be dying at the time of tuberculosis. The medical profession recognizes the importance of doing everything possible to prevent every unnecessary death. At the same time it has not been established by any available evidence that a change in the system of medical practice which would substitute salaried government doctors for the private practitioner or which would make the private practitioner subject to the control of public officials would in any way lower sickness and death rates.

There exists, of course, the fact that some persons are unable to obtain medical service in the circumstances in which they live and that others, surrounded by good facilities, do not have the funds available to secure such services. Obviously, here again there is the question of economics as the basis of the difficulty and perhaps lack of organization in distribution of medical service and a failure to utilize new methods for the distribution of costs which might improve the situation.

The medical profession has approved prepayment plans to cover the costs of hospitalization and also prepayment plans on a cash indemnity basis for meeting the costs of medical care. It continues, however, to feel that the development of the private practice of medicine which has taken place in this country has led to higher standards of medical practice and of medical service than are elsewhere available and that the maintenance of the quality of the service is fundamental in any health program.

8. Expansion of public health and medical services consistent with the American system of democracy.

Careful study of the history of the development of medical care in various nations of the world leads to the inevitable conclusion that the introduction of methods such as compulsory sickness insurance, state medicine and similar technics results in a trend toward communism or totalitarianism and away from democracy as the established form of government. The intensification of dependence of the individual on the state for the provision of the necessities of life tends to make the individual more and more the creature of the state rather than to make the state the servant of the citizen. Great leaders of American thought have repeatedly emphasized the fact that liberty is too great a price to pay for security. George Washington said "He who seeks security through surrender of liberty loses both." Benjamin Franklin said "They that can give up essential liberty to obtain a little temporary safety deserve neither liberty nor safety."

In these times, when the maintenance of the American democracy seems to be the most important objective for all the people of this country, the people may well consider whether some of the plans and programs that have been offered for changing the nature of medical service are not in effect the first step toward an abandonment of the self reliance, free will and personal responsibility that must be the basis of a democratic system of government.

THE SECRETARIES AND EDITORS CONFERENCE

The Annual Conference of Secretaries of Constituent State Medical Associations and Editors of State Medical Journals, held in Chicago on November 17 and 18, proved to be one of the most inspiring and stimulating sessions thus far held under the auspices of the American Medical Association. Among the highlights of the program arranged by Dr. Olin West were the report on "The Study of Medical Care in the United States," read by C. E. Nyberg, of the Bureau of Medical Economics; the analysis of present legislation for a National Health Program by Dr. W. C. Woodward, of the Bureau of Legal Medicine and Legislation, and the report of the Board of Trustees relative to the platform of the American Medical Association, which appears in this issue of *THE JOURNAL*.

The remaining sessions were devoted largely to consideration of actual reports on plans now subject to experiment in various states, particularly that of New Jersey presented by N. M. Scott, of Michigan by L. Fernald Foster, of Washington by V. W. Spickard, and of Pennsylvania by W. F. Donaldson. Moreover, there were discussions of rural medical service by F. S. Crockett, of the Committee on Legislative Activities.

the American Medical Association, and an analysis of the way in which the state of Indiana meets legislative problems, by Thomas A. Hendricks, executive secretary for that state. These reports proved to be clinical sessions dealing with economic experiments. Exhaustive discussions of experiences not only with these plans but with various federal and other agencies now interested in this field brought to light important information. Extensive abstracts of this material will be published in the Organization Section of forthcoming issues of THE JOURNAL.

Similarly, the dinner for state editors, which was attended by practically all of the secretaries as well, proved to be an editorial clinic in which the demonstrator was Dr. Samuel J. Kopetzky, of New York, who spoke on "The Role of the State Medical Journal in Organized Medicine." The discussion on this topic concerned not only the actual preparation of editorials but also the relationship of the state journal to public relations for state medical societies and even such minute problems as the proper use of the editorial "we."

These meetings serve particularly to coordinate the work of the headquarters office of the American Medical Association with the constituent state medical associations, whose secretaries and editors are the chief functioning units in the work of the American Medical Association.

WHY ACETARSONE FOR SYPHILIS?

The use of acetarsones as an antisyphilitic drug which could be taken by mouth has been reviewed recently by Pillsbury and Perlman,¹ who studied 187 cases of congenital syphilis at the Sigma Clinic of the Children's Hospital, University of Pennsylvania School of Medicine. Their conclusions corroborate the previous statements made by the Council on Pharmacy and Chemistry² concerning the use of acetarsones in the treatment of syphilis. The investigators emphasize that acetarsones, although an active antisyphilitic agent by mouth, is less rapid in action than arsphenamine and is inferior to both arsphenamine and bismuth preparations in arresting congenital syphilis. In their series of cases they found a high incidence of reactions. They concluded, indeed, that adequate experimental background for determination of the toxicity and spirocheticidal effect of individual lots of acetarsones is not available. In addition they observed that regularity of attendance of patients at the clinic was not increased by the use of oral therapy as compared to the injection method of administration and that acetarsones is probably not administered as directed to patients treated at home. They stressed that the evaluation of the responsibility

of the patient or guardian is one of the most important features of oral therapy and that lack of cooperation is a contraindication to the use of acetarsones. The authors indicated that for newborn infants the use of a system of dosage based on weight is essential and stated that the system of Bratusch-Marrain³ seems the best available.

Pillsbury and Perlman believe that the convenience and time-saving advantages of oral therapy are not sufficient to substitute for the administration of more effective, less dangerous compounds which must be given parenterally, granted that this may sometimes prove difficult. It might be argued that the high percentage of Negroes among their patients might account for the lack of cooperation or irregularity of attendance. The fact remains that in the case of children the responsibility of adequate and subtoxic dosage is dependent largely on the parent of the patient treated orally at home. This responsibility might also be obviated by insisting that the patient receive the prescribed oral medication from the physician in his office, in which case the advantage of time saving would be lost, plus the inconvenience of frequent visits.

The ease of administration of an oral spirocheticide is sufficiently desirable to encourage the search for an effective antisyphilitic drug which can be given by mouth. Every preparation must be considered, however, in relation to others as to its effect on syphilis, irrespective of the mode of administration required. Because of its inferiority of effectiveness, acetarsones cannot be recommended for general use in the treatment of syphilis. Although there have been numerous favorable reports⁴ of the value of acetarsones for syphilis, there are also others⁵ which criticize its use severely. Whipple and Dunham⁶ state that the period of observation for any adequate evaluation of acetarsones has been sufficient in only four studies. In most reports the ease of administration has been emphasized as an important advantage of acetarsones therapy. This should not excuse the critical examination of the results obtained, which thus far seem to be poorer with acetarsones than with other arsenicals of lesser toxicity.

In addition to the inferiority of results obtained in congenital syphilis with acetarsones, it has been found to be undesirable from the point of view of toxicity. The evidence concerning this is conflicting but has been adequately summarized by Rosahn and Kemp.⁷ They were unable to establish any definite dosage range as safe for rabbits and found that the drug in therapeutic

1. Pillsbury, D. M., and Perlman, H. H.: Acetarsones Therapy in One Hundred and Eighty-Seven Cases of Congenital Syphilis, *Arch. Dermat. & Syph.* 39: 969 (June) 1939.

2. Stovarsol (N. N. R. description), *J. A. M. A.* 84: 1917 (June 20) 1925. Late Congenital Syphilis (Q. & M. N.), *ibid.* 103: 1471 (Nov. 10) 1934. Skin Reaction with Arsenicals (Q. & M. N.), *ibid.* 106: 726 (Feb. 29) 1936.

3. Bratusch-Marrain, Alois: Method and Value of Spirochete Treatment of Syphilis in Childhood, *Arch. f. Kinderh.* 92: 26 (Nov. 28) 1930.

4. Traisman, A. S.: The Use of Antisyphilitic Remedies, *J. A. M. A.* 108: 825 (March 6) 1937. Rosenbaum, H. A.: Acetarsones in the Treatment of Syphilis, *J. A. M. A.* 108: 1280 (April 10) 1937.

5. Cole, H. N.: The Pharmacopoeia and the Physician: The Use of Antisyphilitic Remedies, *J. A. M. A.* 107: 2123 (Dec. 26) 1936; The Use of Antisyphilitic Remedies, *ibid.* 108: 825 (March 6) 1937.

6. Whipple, D. V., and Dunham, E. C.: Congenital Syphilis: II. Prevention and Treatment, *J. Pediat.* 13: 101 (July) 1938.

7. Rosahn, P. D., and Kemp, J. E.: The Oral Administration of Stovarsol in the Treatment of Experimental Syphilis of the Rabbit, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 180 (March) 1937.

doses was sometimes lethal. There was also variation in the toxicity of various lots of the commercial drug. The small difference between the toxic and the therapeutic dose constitutes an additional objection to acetarsone.

Current Comment

THE COLLEGE OF SURGEONS AND THE AMERICAN MEDICAL ASSOCIATION

One of the most important conferences to be held for the promotion of efficiency in the administration of medical affairs in this country took place in the headquarters office of the American Medical Association on November 16, when the Board of Regents and some of the headquarters officials of the American College of Surgeons met with the Board of Trustees and the headquarters officials of the American Medical Association.



Board of Regents of American College of Surgeons, Board of Trustees of American Medical Association, and headquarters officials. Back row from left to right: Dr. Olin West, Miss Eleanor K. Grimm, Dr. Malcolm T. McEachern, Dr. James R. Bloss, Dr. Nathan B. Van Etten, Dr. Fred A. Besley, Dr. James Monroe Mason, Dr. Austin A. Hayden, Mr. Will C. Braun, Dr. W. D. Cutter, Dr. Irvin Abell, Mr. Homer F. Sargent, Dr. Gilbert J. Thomas, Dr. George P. Muller, Dr. R. L. Sensenich, Dr. Walter S. McClellan, Dr. Rock Sleyster. Front row: Mr. Thomas R. Gardiner, Miss Jewel Whelan, Dr. Ralph A. Fenton, Dr. E. L. Henderson, Dr. H. H. Shoulders, Dr. Alton Ochsner, Dr. Harry Gradle, Dr. Howard C. Naffziger, Dr. Morris Fishbein, Dr. Arthur M. Shipley, Dr. Arthur W. Booth, Dr. Fred Collier, Dr. Herman L. Kretschmer, Dr. Thomas B. Cullen, Dr. Alphonse McMahon, Dr. Roger I. Lee, Dr. George W. Crile.

ciation. The session was devoted largely to a consideration of increasing efficiency, avoiding duplication, and enhancing the importance of the inspection of hospitals, not only for their utility in caring for the sick but also in relationship to their work in surgery and their availability as institutions for the education of interns and for the establishment of residencies in the specialties. The many years of experience of the Council on Medical Education and Hospitals and of the Hospital Section of the American College of Surgeons, which are now cooperating in these efforts, warrant the placing of full reliance on this joint effort. Consideration was given also to many questions concerned with the appointments of the staffs of hospitals and the manner in which the two organizations could function together in the maintenance of the quality of medical service in our country.

OHIO HEALTH DEPARTMENT REORGANIZED

The health department of the state of Ohio has been reorganized "to enhance its efficiency by removing it, so far as possible, from political interference."¹ *Ohio Public Health*² reports the appointment of a public health council provided by a new law passed by the last session of the Ohio general assembly.² The new council consists of six members, of whom three are physicians, one is a dentist, one is president of the Ohio Congress of Parents and Teachers, and one is a sanitary engineer. The former public health council consisted of five members all appointed by the governor. The new organization provides that the director of health shall be appointed for five years instead of being removable at the pleasure of the governor. He cannot now be removed by the incoming governor except by written request of a majority of the public health council.

cil. The enactment of legislation to remove public health departments from politics is always encouraging. Of course the functioning of the new law will depend on how it is administered, but even in the hands of self-seeking politicians such laws have a tendency to protect the tenure of office of a competent official and thus give continuity and integration to public health work in the state. The presence of physicians and dentists representing the organizations of these professions and of representatives of civic organizations on public health boards or councils tends to discourage political meddling, which has been one of the most discouraging factors with which sincere public health officials have been forced to contend.

1. *Ohio Public Health* 3: 3 (Sept.) 1939.
2. Laws of Ohio, 1939, approved May 17, introduced as House Bill 111.

Association News

THE SCIENTIFIC EXHIBIT

Application blanks for space in the Scientific Exhibit at the New York Session, June 10-14, 1940, are now available. Requests for blanks and for information concerning the Scientific Exhibit should be sent to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

MEDICINE IN THE NEWS

The seventh season of broadcasting by the American Medical Association over the facilities of the National Broadcasting Company and affiliated stations opened Thursday November 2 at 4:30 p. m. eastern standard time (3:30 central standard time, 2:30 mountain time and 1:30 Pacific time). The title of the program will be Medicine in the News.

True to their title, the programs consist of dramatizations based on what is happening in the world of medicine. Each program will include a principal news item from THE JOURNAL or some other reputable medical source or from Hygeia. This will be followed by one or more highlights on current medical news. Each program will close with a question of the week drawn from the question and answer correspondence of Hygeia. A question will be asked each week and answered the following week.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

A Definition of Epilepsy.—At a meeting October 7 the California State Board of Public Health defined "epilepsy" as follows: Any condition which brings about momentary lapses of consciousness, and which may become chronic, shall be considered reportable under the term "epilepsy." This action was taken in view of recent legislation making epilepsy a reportable disease. Physicians are now required to report cases to the local health officers, who will in turn report to the state department of health.

Society News.—A symposium on physical therapeutic methods was presented before the San Francisco County Medical Society November 14 by Drs. Tilman Howard Plank, Harry Glenn Bell, William C. Deamer, Alice Potter, William H. Northway and Frances Baker. All are of San Francisco. The medical and surgical aspects of hypertension were discussed before the Alameda County Medical Association, Oakland, November 20 by Drs. Archibald A. Alexander, Hugh Gordon MacLean and William Whitfield Crane, Oakland.

Postgraduate Assembly.—The Huntington Memorial Hospital and the Stanley P. Black Memorial Association, Pasadena, sponsored a postgraduate assembly October 2-7. Among the speakers were:

- Dr. Loren R. Chandler, San Francisco, Abdominal Surgery in Children.
- Dr. Roy E. Thomas, Los Angeles, The General Management and Treatment of Pneumonia.
- Dr. Hans Lisser, San Francisco, Childhood and Adult Hypothyroidism and the Proper Use of Thyroid Substance.
- Dr. Frank S. Doley, Los Angeles, Recent Advances in the Surgical Treatment of Diseases of the Chest.
- Chauncey D. Leake, Ph.D., San Francisco, Practical Aspects of Recent Advances in Pharmacology.
- Dr. Ludwig A. Emge, San Francisco, The Toxemias and Other Complications of Pregnancy.

FLORIDA

Society News.—At a meeting of the Dade County Medical Society recently the speakers were Drs. Elmer H. Adkins, Miami Beach, on "Thyroglossal Duct Cysts and Fistulae" and Iva C. Youmans, Miami, "Technical Requirements as Related to the Growth of Medicine."—The Duval County Medical Society was addressed in Jacksonville October 3 by Dr. Lincoln S. Lahtie on "Quinidine in Some Manifestations of Heart

Disease."—At a recent meeting of the Pinellas County Medical Society Dr. Nonie W. Gable, St. Petersburg, spoke on ethmoiditis.

Basic Science Board Appointments.—Members of the state board of examiners in the basic sciences for Florida include the following recently appointed by the governor, according to the *Journal of the Florida Medical Association*: Mark Wirth Emmel, D.V.M., professor of veterinary science, University of Florida, Gainesville, chairman; John Ferguson Conn, Ph.D., secretary, professor of chemistry, John B. Stetson University, Deland; Ezda May Deviney, Ph.D., professor of zoology, Florida State College for Women, Tallahassee; Jay F. W. Pearson, Ph.D., professor of zoology, University of Miami, Coral Gables, and Donald D. Bode, Ph.D., professor of chemistry, Tampa University.

District Health Units Abolished.—Newspapers report the discontinuance of the five district health units in Florida established to render emergency service in counties without full time health units. Hereafter this service will be administered by the state department direct from the central office at Jacksonville. The district units were located in Marianna, Jacksonville, Ocala, Bartow and West Palm Beach. According to the report, abolition of the health districts was recommended by the American Public Health Association in a recent statewide survey of Florida's public health conditions. Concurring in the recommendation, the U. S. Public Health Service has refused to allow further use of federal allocations to Florida for this type of service, it was stated. It was also said that the money used to finance these districts should be devoted to establishing full time health departments.

ILLINOIS

Personal.—Dr. Alfred S. Ash, formerly of Chicago, has been placed in charge of the Soldiers' and Sailors' Home and Hospital, Quincy, succeeding the late Dr. Chauncey E. Ehle. —Dr. Charles E. Soule, Beardstown, was recently guest of honor at a banquet given by the Cass County Medical Society in recognition of his fifty years in the practice of medicine. The Illinois State Medical Society presented him with a certificate and medal.

Report on Trachoma.—A total of 161,903 persons have attended the five trachoma clinics of the state during the five years of their existence. These clinics, established about 25 miles apart in Shawneetown, Jonesboro, Eldorado, Herrin and Vienna, give treatments each week to about 700 persons of all ages and in varying stages of trachoma. On August 12 there were 3,276 cases of positive trachoma under care at the five clinics, with 1,295 suspects under observation. According to *Welfarc*, 191 operations were performed in the past year. Of the 331 new patients with positive trachoma received for treatment at the clinics in the year ended June 30, 1938, there were thirty-three, or 10 per cent, who had beginning trachoma; fifty-five were in the second stage, sixty-six in the third stage and 177 in the fourth stage. Many persons who came to the clinics for diagnosis did not have trachoma but suffered from other eye conditions which threatened their vision. Of these, eighty-eight were sent to the Illinois Eye and Ear Infirmary during the past year and twenty-four more are waiting until beds are available.

Chicago

Hospital News.—The Illinois Eye and Ear Infirmary has instituted a course of training for orthoptic technicians following principles outlined by the recently organized American Orthoptic Council. Four technicians will be taken for a six months course beginning in January.

The Bacon Lectures.—Dr. Robert Meyer, formerly director of Pathological Institute (Gynecological Clinic) and honorary professor at Friedrich-Wilhelms University, Berlin, will deliver the Charles Sumner Bacon Lectures for 1939-1940 at the Medical and Dental College Laboratories Building, University of Illinois College of Medicine December 6-7. His subjects will be "The Basis of the Histological Diagnosis of Carcinoma" and "Diagnosis of Early Carcinoma of the Cervix."

Grants for Research.—The Institute of Medicine of Chicago announces that the entire Elizabeth McCormick Child Research Grant of \$1,000 for 1939-1940 will be used for the encouragement of research and that awards have been made to Dr. Mila I. Picree, Evanston, for work on leukemia; to Dr. Heyworth N. Sanford for a study of the role of the qualitative platelet factors in the coagulation of the blood, and to Dr. Clayton J. Lundy for a study of heart murmurs in children with rheumatic heart disease, utilizing a heart sound recording machine simultaneously with an electrocardiograph.

MEDICAL NEWS

JOUR. A. M.
Nov. 25,

Society News.—At a meeting of the Chicago Orthopaedic Society November 10 the speakers were Drs. Henry W. Meyerding, Rochester, Minn., on "Ewing's Tumor (Endothelial Myeloma; Angioblastoma): Diagnostic and Therapeutic Experience in 114 Cases" and Paul H. Dube, "Lesions of Bone Associated with Thyroid Disease."—The Chicago Gynecological Society was addressed November 17 by Drs. Henry Close Hesselstine and George P. Bohlender on "Closure and Subsequent Care in Obstetric and Gynecologic Abdominal Wound Disruption" and Richard W. TeLinde, Baltimore, "Decidua-like Changes in the Endometrium Without Pregnancy."—Dr. Arthur H. Curtis, professor of obstetrics and gynecology, Northwestern University Medical School, will deliver the presidential address before the twenty-fourth annual meeting of the Institute of Medicine of Chicago December 5 on "Some New Features of Gynecologic Anatomy and Related Clinical Problems."

was to receive a bronze plaque as a token of this recognition, was reported.—Dr. George L. G. Cranier, Owosso, was presented with a leather bag by the Shiawassee County Medical Society October 19 in honor of his fifty years in the practice of medicine.

NEBRASKA

Professor Retires.—Dr. Gustave W. Dishong, professor and head of the department of nervous and mental diseases at Creighton University School of Medicine, Omaha, since 1910, has retired after twenty-seven years on the faculty. He graduated from Creighton in 1907. Dr. Dishong has been succeeded by Dr. Ernest Kelley, associate professor in the department. Dr. Kelley also graduated from Creighton in 1907.

Society News.—Drs. James F. Kelly and John J. Freymann, Omaha, addressed the Adams County Medical Society in Ingleside October 4 on "X-Ray Therapy" and "Ovarian Hormones and Their Relationship to the Disturbances of Menstruation and Reproduction" respectively.—Drs. Lynn T. Hall, Omaha, and Paul M. Bancroft, Lincoln, addressed the Custer County Medical Society, Broken Bow, October 17 on pneumonia in adults and in children, respectively.

District Meetings.—The Seventh Councilor District Medical Society held its annual meeting at Fairbury October 19. The speakers were Drs. Charles A. Tompkins, Omaha, on "Diagnosis and Treatment of Functional and Organic Obstruction of the Gastro-Intestinal Tract of Infants"; Harry E. Harvey, Lincoln, "Analysis of Confusing Pelvic Symptoms"; Ralph H. Luikart, Omaha, "Indications and Contraindications for Cesarean Operations," and Clayton F. Andrews, Lincoln, "Surgical Diseases of Childhood." Dr. Arthur L. Miller, Kimball, president of the Nebraska State Medical Association, and Mr. M. C. Smith, Curtis, executive secretary, also made addresses.—Drs. John C. Thompson and Frederick F. Teal Jr., Lincoln, addressed a meeting of the Sixth Councilor District in David City October 16 on the causes and treatment of headache and "Improvement in Position of Fractures After Primary Reduction" respectively.

NEW JERSEY

Personal.—Dr. Marcus W. Newcomb, Browns Mills, was honored at a testimonial dinner at the Community House, Moorestown, recently in recognition of his twentieth anniversary as superintendent of Fairview Sanatorium, New Lisbon. Dr. William J. Carrington, Atlantic City, was the toastmaster and Dr. Edward John G. Beardsley, Philadelphia, the principal speaker. More than 400 attended the meeting.

Society News.—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, addressed the Essex County Medical Society Newark, November 9 on "American Medicine and the National Government."—Drs. Bela Schick, New York, and Nathan Northern New Jersey November 16 on "Newer Treatment Methods for the Respiratory Diseases of Childhood" and "Acute Laryngotracheobronchitis with Membrane Formation" respectively.

NEW YORK

Cancer Day in Nassau County.—Dr. Louis C. Kress, Buffalo, director of the division of cancer control, state department of health, addressed the Medical Society of the County of Nassau, Garden City, October 31, meeting with the Nassau County Dental Society, on "How the State Department Can Help You with Your Cancer Patients." This was the final session of a "Cancer Day" sponsored by the Nassau County Cancer Committee. There was a luncheon session at which Drs. Arthur C. Martin, Garden City, Earle G. Brown, Mineola, and John M. Swan, Rochester, spoke on various aspects of cancer control. At an afternoon session for women Drs. Kress and Norman Treves, New York, were the speakers.

New York City

Dr. Barr to Lecture.—Dr. David P. Barr, Busch professor of medicine, Washington University School of Medicine, St. Louis, will give an address at Cornell University Medical College December 13 under the auspices of the Cornell chapter of Nu Sigma Nu. Dr. Barr's subject will be "The Nature of Obesity."

Medical Dental Meeting.—The Joint Committee of the Organized Medical and Dental Professions announces the ninth annual medical-dental convention to be held December 4 at the Hotel Pennsylvania. At the morning session there will

IOWA

Discussions Instead of Refresher Courses.—The state medical journal announces that round table discussions on maternal and child health will be substituted for the "refresher" courses on pediatrics and obstetrics which have been held throughout the state in the past. Case histories will be used to illustrate points in the discussion and the local audience will be urged to present case histories of its own for review by the round table. The new programs were to begin after November 15.

MAINE

Society News.—Dr. Theodore M. Stevens addressed the Portland Medical Club October 3 on "Pyelitis in Pregnancy" and Velma Pettiner, director of the Portland District Nursing Association, discussed the service and problems of that society in Rockland October 3. Dr. Francis C. McDonald, Boston, discussed "Gastro-Intestinal Disturbances in Infancy."—Dr. Lorne C. Montgomery, Montreal, addressed the Oxford County Medical Society October 25 on pneumonia.—The Penobscot County Medical Society was addressed October 17 in Bangor by Dr. Paul D. White, Boston, on "Heart Diseases."

MICHIGAN

New Administrator for Battle Creek Sanitarium.—Dr. John E. Gorrell, medical director of the Blodgett Memorial Hospital, Grand Rapids, has been appointed administrator of the Battle Creek Sanitarium, Battle Creek. Dr. Gorrell graduated at Northwestern University Medical School, Chicago, in 1930.

Pneumonia Serum Available.—Antipneumococcus serum for the treatment of types I and II pneumonia will again be distributed free to physicians during the 1939-1940 pneumonia season, according to the state department of health. The serum will be available from fifty-two distributing centers throughout the state in addition to thirty branch distributing centers in full time county and city health departments. Typing service will be available at 146 stations in addition to service available from the state department of health laboratories at Lansing, Grand Rapids, Houghton and Powers.

Graduate Conferences.—The fall graduate conferences of physicians sponsored by the Wayne County Medical Society, the Wayne University College of Medicine, the Detroit Tuberculosis Sanatorium and the Detroit Department of Health started November 22 with Dr. Sidney D. Kramer of the division of virology of the state department of health, Lansing, discussing "Virus Diseases." The remaining lectures in the series are:

Dr. John Alexander, Ann Arbor, November 29, Collapse Therapy in the Control of Tuberculosis.
Dr. Ward F. Seely, Detroit, Management of Hemorrhage in Late Pregnancy.
Drs. Henry Cook, Flint, and Clarence D. Selby, Detroit, December 13, Industrial Hygiene in Automotive Manufacturing.

Personal.—Dr. Fred T. Andrews, formerly of Kalamazoo, has been selected as health officer for Bay County, effective October 9.—Dr. Edward G. McGavran, Hillsdale, has resigned as director of the Hillsdale County department of health to devote his time to research. It is reported.—Dr. Dean C. Burns, medical director of the Little Traverse Hospital, Petoskey, has been appointed a member of the state tuberculosis commission. Dr. Burns was recently chosen by residents of the city as the leading citizen of Petoskey and

be a symposium on "Inefficient Mastication—Its Development, Effects and Treatment" by Max J. Futterman, D.D.S., Dr. Albert F. R. Andresen and Clyde H. Schuyler, D.D.S. In the afternoon there will be a clinical meeting followed by a demonstration by a group from the Kings County Hospital.

Dr. Neumann Dies.—Dr. Heinrich Neumann, for many years a distinguished specialist in diseases of the ear in Vienna, died in New York November 6, aged 66. Dr. Neumann was a native of Hungary and took his medical degree from the University of Vienna in 1898. He was appointed to the faculty of the university in 1919 and served until 1938. He came to the United States last spring to work on the refugee problem with the American Jewish Joint Distribution Committee, the *New York Times* reported.

Medal Awarded to Dr. Wood.—The New York City Cancer Committee at its annual dinner November 2 awarded the 1939 Clement Cleveland Medal to Dr. Francis Carter Wood, director of the Institute of Cancer Research at Columbia University College of Physicians and Surgeons. The award was made in recognition of Dr. Wood's work as chairman of the New York World's Fair Cancer Exhibit, sponsored by the city committee. Mrs. Robert G. Mead, who founded the award in 1937 in memory of her father, made the presentation and directed attention to Dr. Wood's work with the American Society for the Control of Cancer and as president of the recent International Cancer Congress in Atlantic City. A special foreign award of the Cleveland Medal was made earlier this year to Mlle. Eve Curie, daughter and biographer of Marie Curie.

Code on Work Relations in Hospitals.—The Greater New York Hospital Association recently adopted a code of employee relations in which it asserted the right of voluntary hospitals to discharge employees "without intimidation or interference when in the judgment of the management such course is in the interest of the welfare of the patients and efficiency of the institution." The association agreed that employees should be free to join any lawful organization but declared that employment should not be made dependent on membership or nonmembership in any group. The statement also pointed out that, although hours of work should not exceed a reasonable maximum per day or week, emergent situations may require longer periods in some departments and that the peculiar nature of hospital work makes it difficult to adhere to time schedules such as obtain in industry.

NORTH DAKOTA

Personal.—Dr. Cedric Northrop, Portland, Ore., has been appointed superintendent of the North Dakota State Tuberculosis Sanatorium, San Haven, to succeed Dr. George Alfred Dods.

New Members of State Medical Board.—Drs. Paul H. Burton, Fargo, and William F. Sihler, Devils Lake, have been appointed to the state board of medical examiners. They succeed Drs. Archie D. McCannel, Minot, and Albert W. Skelsey, Fargo, whose terms expired. Dr. George M. Williamson, Grand Forks, was reappointed.

OHIO

Brush Foundation Affiliated with Western Reserve.—The trustees of Western Reserve University and of the Brush Foundation have entered into an agreement by which the studies on human growth, development and sex initiated by the late Dr. T. Wingate Todd for the Brush Foundation and other foundations as well as future studies sponsored by the Brush Foundation will be conducted through the university's school of medicine. William W. Greulich, Ph.D., research associate in anatomy and physical anthropology at Yale University School of Medicine, New Haven, Conn., has been appointed director of the foundation and professor of physical anthropology and anatomy in the department of anatomy in the medical school.

OREGON

Annual Registration Due December 1.—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to register annually on or before December 1 with the secretary of the Board of Medical Examiners and at that time to pay a fee of \$5. A practitioner failing to register is subject to a penalty of \$1 for each thirty days, or part thereof, of default and his failure to reregister within ninety days after December 1 is a misdemeanor.

PENNSYLVANIA

Personal.—Dr. Ezra Pope Dickinson, St. Michael, has been appointed medical director of Cambria County, succeeding Dr. James J. O'Connor, Barnesboro. Dr. William T. Davis, Scranton, has been appointed medical director of Lackawanna County, succeeding Dr. John J. Bendick, Olyphant.

Philadelphia

Society News.—A symposium on rheumatic fever was presented before the Philadelphia Rheumatism Society November 16 by Drs. Paul H. Parker, Jenkintown, Pa., Louis B. Laplace and William D. Stroud. A symposium on anesthesia was presented before the Philadelphia Laryngological Society November 7 by Drs. Helen E. Riggs, Albert Behrend and Edward W. Beach. Lieut. Col. James E. Ash, curator of the Army Medical Museum, Washington, D. C., addressed the Pathological Society of Philadelphia November 9 on "Tumors of the Urinary Bladder." At a meeting of the Philadelphia Psychiatric Society November 10 the speakers were Drs. Morris W. Brody and Herbert Freed on "Compulsive Phenomena with Associated Oculogyric Crises"; Paul Sloane, "Psychotherapy; Principles Underlying the Choice of Therapy," and James J. Waygood, "Treatment of Milder Psychoses."

Program of College of Physicians.—The coming scientific lectures of the College of Physicians of Philadelphia for the current season include the following:

Dr. Howard T. Karsner, Cleveland, Certain Ovarian Tumors Associated with Sexual Endocrine Dysfunction, December 6.
Dr. Charles Armstrong, Washington, D. C., Recent Developments in Central Nervous System Virus Infections, with Special Reference to Lymphocytic Meningitis and Poliomyelitis, January 3.
Dr. Tom D. Spies, Cincinnati, Clinical and Laboratory Studies on the Avitaminoses, with Special Reference to Nicotinic Acid, Thiamin and Riboflavin, February 7.
Dr. Alvin F. Coburn, New York, Factors in the Initiation of Rheumatic Activity, March 6.
Dr. Baldwin H. E. W. Lucke, Philadelphia, Tumors in Cold-Blooded Animals, Their Significance in the Experimental Investigation of Cancer; and Dr. Joseph McFarland, Philadelphia, The Pathological Diagnosis of Cancer in Man, April 3.

Three lectures for the public are included in the program: November 17, Dr. Oliver H. P. Pepper on "Medical Problems of Advancing Age"; January 19, Dr. Jacob Parsons Schaeffer, "The Human Constitution and Some of Its Problems," and April 12, Dr. William Edward Chamberlain, "The X-Ray as an Aid in Diagnosis."

Pittsburgh

Academy Celebrates Golden Anniversary.—The Pittsburgh Academy of Medicine celebrated its fiftieth anniversary with a dinner November 11. The speakers were Drs. Nathan B. Van Etten, New York, President-Elect of the American Medical Association; Charles H. Henninger, Pittsburgh, president of the Medical Society of the State of Pennsylvania, and Henry T. Price, president of the Allegheny County Medical Society. The oldest living fellows of the academy are Drs. Ewing W. Day, Provincetown, Mass., Theodore Diller and Joseph M. Douthett. No original charter members are living. The academy is especially distinguished for its library of 20,000 volumes. It acquired the Pittsburgh Medical Library Association's volumes in 1896; in 1917 it moved into its own building and has employed a full time librarian since 1922.

SOUTH DAKOTA

Personal.—Dr. George J. Frazier, Gregory, was presented with the 1939 Indian achievement medal by the Indian Council Fire at a meeting in Chicago September 22. Dr. Frazier, a full blooded Indian, according to newspaper reports, has been in the Indian service for twenty-five years and at present serves among the Sioux of South Dakota.

TEXAS

Public Health Meeting.—Dr. John W. E. H. Beck, Austin, was elected president of the Texas Public Health Association at the annual meeting in Galveston in October. Among the speakers were Drs. Holman Taylor, Fort Worth, secretary, State Medical Association of Texas, on "Cooperative Responsibility in the Development of Our Public Health Program"; Preston Hunt, Texarkana, president-elect of the state medical association, "Building Sound Public Health Policy"; Shirley S. Bowen, Galveston, "The Physician's Responsibility for Health Education"; John W. Spies, dean, University of Texas School of Medicine, "Public Health in the Medical Curriculum"; Erval R. Coffey, U. S. Public

Health Service, "Practical Problems of Public Health," and Mr. John Carmody, administrator of the Federal Works Agency, Washington, D. C., "The Meaning of Public Health to the Nation."

VERMONT

New Dean at Medical College.—Dr. Hardy A. Kemp, professor of bacteriology and preventive medicine at Baylor University College of Medicine, Dallas, Texas, has been appointed dean of the University of Vermont College of Medicine, Burlington. Dr. Kemp succeeds Dr. James N. Jenne, who died Sept. 9, 1937. During the period since Dr. Jenne's death Dr. Ernest H. Buttles, professor of pathology and bacteriology, has been chairman of a committee of administration for the school. Dr. Kemp, who is 37 years old, graduated from St. Louis University School of Medicine in 1926 and went to Baylor in 1928 as associate professor of bacteriology and hygiene. Among new members added to the faculty are the following:

Dr. Bird J. A. Bombard, Burlington, associate professor of clinical surgery.

Dr. Aymer S. C. Hill, Winooski, assistant professor of clinical medicine.

Dr. Arthur R. Hogan, Burlington, assistant professor of clinical surgery.

Dr. Peter P. Lawlor, Burlington, assistant professor of otolaryngology and rhinology and clinical instructor in ophthalmology.

Dr. Wilhelm Raab, formerly of Vienna, assistant professor of clinical medicine.

WEST VIRGINIA

Changes in State Health Department.—Dr. John F. Cadden, director of the bureau of industrial hygiene of the state department of health, has resigned to become medical director of the plant of the American Viscose Corporation at Roanoke, Va. Dr. Charles N. Scott, director of the bureau of venereal disease, has accepted a similar position with the viscose plant at Nitro. Dr. John B. Hozier of the U. S. Public Health Service, recently lent to the health department to develop the venereal disease program, was named to succeed Dr. Scott. Dr. Thomas H. Blake, director of county health work, resigned to enter private practice at St. Albans. Dr. Bruce H. Pollock, Point Pleasant, has been appointed to succeed Dr. Blake.

Society News.—Dr. Allen F. Voshell, Baltimore, gave an address before the Ohio County Medical Society, Wheeling, November 3 entitled "A Discussion of Fracture Fundamentals and Errors."—Dr. Stanley Weinstein, Huntington, addressed the Cabell County Medical Society, Huntington, October 12 on the "Glandular and Hormone Treatment of the Menopause." The society adopted a resolution favoring the proposed creation of a national department of health with a cabinet portfolio.—Dr. Thomas K. Laird and Robert Harold Jones, Montgomery, addressed the Fayette County Medical Society, Montgomery, October 17, on "Etiology, Symptomatology and Treatment of Pelvic Infections in Women" and "Value of Gastroscopic Study" respectively.—Dr. Harold W. Jacox, Pittsburgh, addressed the Kanawha Medical Society, Charleston, October 10 on "Lymphoblastoma."—At a meeting of the Lewis County Medical Society in Weston October 10 the speaker was Dr. William R. Goff, Parkersburg, on "Diagnosis of Thyroid Conditions."—Dr. Hugh W. Macmillan, Cincinnati, who is also a dentist, addressed a joint meeting of the Logan County medical and dental societies in Logan November 8 on "Deep Abscesses of the Neck of Dental Origin."

GENERAL

Special Society Election.—Dr. Charles W. M. Poynter, Omaha, was chosen president-elect of the Association of American Medical Colleges at its annual meeting in Cincinnati October 23-25 and Dr. Russell H. Oppenheimer, Atlanta, Ga., was installed as president. Dr. Eben J. Carey, Milwaukee, was elected vice president and Dr. Fred C. Zapffe, Chicago, reelected secretary. Next year's meeting will be at the University of Michigan, Ann Arbor.

Another Swindler.—A man giving the name of Folger and claiming to represent Folger and Company, St. Louis, recently collected money in advance from a Chicago physician for an order of medical supplies. He claimed to be an expert on repairing blood pressure apparatus and stethoscopes. On investigation it was found that Folger and Company do not handle medical supplies and that this firm has no representative in Chicago and no representative named Folger. This man is about 55 years old, 5 feet 4 inches tall, weighs about 135 pounds and is well versed in medicine, according to the report.

Nobel Prize Goes to Professor Lawrence.—The 1939 Nobel prize for physics was awarded November 9 to Ernest O. Lawrence, Ph.D., professor of physics and director of the

radiation laboratory, University of California, Berkeley, for invention and development of the cyclotron and results obtained with it, especially in disintegration of the atom and production of artificially radioactive elements. Dr. Lawrence was born in Canton, S. D., in 1901. He graduated at the University of South Dakota in 1922, receiving an honorary degree of doctor of science in 1936. Yale University awarded him the degree of doctor of philosophy in 1925 and an honorary science degree in 1937. Prior to joining the staff of the University of California he was associated with Yale.

Symposium on Blood, Heart and Circulation.—The Section on Medical Sciences (N) of the American Association for the Advancement of Science announces that its sessions at the Christmas meeting in Columbus, Ohio, December 27-30, will be devoted to a symposium on the blood, heart and circulation. Topics for the separate sessions are: blood, physiology of coronary blood flow, pathology of the coronary circulation, cardiac failure, hypertension, heart and circulation in special territories. Twenty-eight papers are listed on the program. In addition, Dr. Carl J. Wiggers, Cleveland, vice president of the section, will deliver his official address on "The Physiology of Coronary Blood Flow" and the Theobald Smith Award in Medicine is to be awarded to Dr. Albert B. Sabin, Cincinnati, who will speak on "Constitutional Barriers to Involvement of the Nervous System by Certain Viruses."

Lalor Foundation Awards Available.—Applications are invited for the fourth series of awards by the Lalor Foundation for fundamental research in chemistry. The awards are open to men and women for work anywhere. The Ph.D. degree or training equivalent thereto is a requirement. Final selections will be based on the previous training, demonstrated competence and promise of the candidates in their fields of work. Preference will be given for part of the awards to candidates directing their research toward applying the principles and discoveries of physical and organic chemistry to problems in the fields of biochemistry and chemotherapy. In the case of awards of this kind, renewals of the grants for an additional year will be favorably considered. Time to be spent in acquiring training in the medical studies necessary for a thorough understanding of the clinical aspects of the subjects will be considered acceptable as a part of the plan of the work of the candidate. Individual awards will range between \$1,800 and \$2,500 or according to the special needs of the candidate. Inquiries and requests for application forms should be addressed to C. Lalor Burdick, Secretary, Lalor Foundation, Wilmington, Del. Applications must be in the hands of the secretary by December 31. Appointments will be announced early next March.

Council on Problems of Alcohol.—A new executive committee of the Research Council on Problems of Alcohol announced at a recent meeting a broad program for attacking the diseases of alcoholism. Dr. Karl M. Bowman, director of psychiatry, Bellevue Hospital, New York, chairman of the committee, announced three grants of financial aid to the organization. The Carnegie Corporation has appropriated \$25,000 for a survey of work done to date on the effects of alcohol on the individual, a project sponsored by the department of psychiatry, New York University College of Medicine, under the supervision of Dr. Norman H. Jolliffe, associate professor of medicine. The American Philosophical Society is financing a study of the toxic factors in alcoholism conducted at the New York Psychiatric Institute under the direction of Dr. George A. Jervis. In addition, the Dazian Foundation for Medical Research has granted funds for research on the role of alcohol in liver cirrhosis, a project initiated by New York University College of Medicine. Members of the new executive committee are:

Forest R. Moulton, Ph.D., Washington, D. C., permanent secretary, American Association for the Advancement of Science.

Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital, Washington.

Dr. Lawrence Kolb, chief, division of mental hygiene, U. S. Public Health Service, Washington.

Dr. Nolan D. C. Lewis, professor of psychiatry, Columbia University College of Physicians and Surgeons, New York.

Hans T. Clarke, D.Sc., professor of biochemistry, Columbia University, New York.

Luther H. Gulick, Ph.D., director, Institute of Public Administration, New York.

Mr. Leonard Harrison, director of the Committee on Youth and Justice, New York.

Mr. Austin H. MacCormick, commissioner of correction, New York.

Albert T. Poffenberger, Ph.D., professor of psychology, Columbia University, New York.

Robert W. Searle, D.D., general secretary of the Greater New York Federation of Churches, New York.

Mr. Albert W. Whitney, consulting director, National Conservation Bureau, New York.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 25, 1939.

The Decadence of Science Under Nazi Rule

Sir Thomas Holland, principal and vice chancellor of Edinburgh University, presiding at a graduation ceremony, predicted a degeneration in German military efficiency as a result of neglect of scientific research, which was evident in the last six years. Sir Thomas, who is a past president of the Institution of Mining and Metallurgy, said that during those years German universities turned out from their research laboratories a gradually diminishing stream of products. Six or seven years ago no scientific man in the world would have dared to pass over the publications of the research institutions of Germany. Not only were they great in volume but their quality was of a kind that led the world. Today these volumes of output have diminished to small fragments of their former size, and their quality is negligible. One can predict from this fact alone that the neglect of fundamental truth for its own sake must be followed by degeneration in technical efficiency. What is less important possibly, but immediately important to everybody in Europe, is that this neglect certainly will be followed by degeneration in military efficiency. It is now or never for Germany, even from the military point of view. Referring to the suggestion that Germany itself might soon save the situation, Sir Thomas said that it was easy to destroy a great structure but that it took many years to build another like it. Only the very youngest in the room would live to see the time when German universities would be restored to their old position in the intellectual world.

Deaths from Road Accidents Doubled by the Black Out

The restrictions on street lighting rendered necessary by the danger of air raids has doubled the fatalities from road accidents. In the House of Commons the minister of transport reported that the number of persons who died during September as a result of road accidents was 1,130 against 554 in September a year ago. Information as to the number injured was not available. Since the first days of the emergency, efforts had been made to achieve the maximum possible safety in road conditions consistent with demands of defense against attacks from the air. The public could help to secure a reduction in accidents by increased care on the roads and refraining from the use of automobiles after dark except when absolutely necessary. Many accidents occurred to pedestrians crossing the road, as the drivers could not see them before their cars struck them. It is suggested that pedestrians should wear or carry something white or of a light color and walk on the left side of the pavement. The "Safety First Council" described the foregoing figure as the most serious statement on road accidents ever made in Great Britain. War time conditions have prevented the compiling of the figure for the injured. If the proportion to killed remains the same as before—a reasonable assumption—more than 40,000 persons must have been injured on the roads this September, 10,000 of them seriously.

The Danger of Radium Dispersal by Air Raids

The Emergency Measures Committee of the National Radium Commission has issued a memorandum on the danger of radium dispersal by aerial bombardment, by A. R. Greatbatch, of the Research Department of the Woolwich Arsenal. He points out that in considering dangers from aerial bombardment attention must be given to the disruptive action of a high explosive bomb on radium containers and the probable dispersion of radium dust over a wide area. Unprotected radium needles would almost certainly be disrupted and the contents scattered

by the blast from the explosion of a 500 pound bomb within a range of 20 feet. Any envelop surrounding the needle would afford some protection. A reasonable protection would be given by a steel container 3 inches thick. The danger from fragmentation is of a different nature. The radium container may be struck by one of the thousands of fragments hurled by the force of the explosion at double or even treble the muzzle velocity of a rifle bullet. This danger may extend to more than a hundred feet from the bomb. A direct hit by a fragment within this area would shatter a container unless heavily protected in the manner described. The protective value of the building housing the radium must be considered. It should be related to the fact that bombs dropped from a height of 10,000 feet or more can penetrate 5 feet of concrete and 30 feet of earth. Thus for complete protection from a 500 pound bomb the radium should be covered by more than 30 feet of earth. The recommendation that radium should be sunk 50 feet in the ground (which already has been done) will therefore ensure safety from radium dispersal in all circumstances, including a direct hit.

Casualty Evacuation Trains for Civilians

The vast organization formed for the defense of the civilian population against air raids has been described in previous letters. Every possible contingency, even to the disposal of the dead, has been the subject of careful planning. A new example is trains specially adapted for the evacuation of air raid casualties from hospitals in dangerous areas to base hospitals outside them. There are twenty such trains in London, eight in the English provinces and two in Scotland. Their crews consist of one medical officer, one hospital train officer, three trained nurses and ten auxiliary nurses. Each train is made up of nine parcel vans converted to take thirty stretchers in each van. Brackets have been fixed to the sides of the vans, and the stretchers are in two tiers. There is a coach with a kitchen attached, so that the patients can have hot meals during the journey. All the crews have been working on their trains for some time, so that they now form organized teams.

Adaptation of the British Pharmacopeia to War Conditions

The British Pharmacopeia Commission is engaged on modification of the pharmacopeia to the exigencies of war. The strain imposed on the medical services of the country renders necessary the utmost economy in the prescribing of drugs. At the invitation of the Ministry of Health, the Medical Research Council has formed a therapeutic requirements subcommittee to advise the ministry and the medical and pharmaceutical professions on economy in the use of drugs. When there are several remedies for a particular disease it may be desirable to concentrate on the manufacture of a particular one. Difficulties may arise from the fact that the raw materials for the manufacture of many remedies have to be imported from abroad or because war conditions may cause an abnormal demand for certain drugs.

The Conveyance of Disease by Airplane

At the Royal Society of Medicine, Air Commodore H. E. Whittingham said that journeys by air from countries where the major infectious diseases—cholera, plague, smallpox, typhus and yellow fever—are endemic to uninfected countries are now usually completed well within the incubation periods of these diseases. The health control of traffic is based on the International Sanitary Convention for Aerial Navigation, 1933, which specifies the maximum measures which may be imposed but leaves their application to each country, the aim being to make the regulations as uniform as possible, to lessen inconvenience to passengers and cause the minimum delay. Each government has drawn up its own regulations for the sanitary con-

trol of aviation. In the United Kingdom aircraft are permitted to land only at the authorized airdromes. A sanitary airdrome is designated "a local area" if it is beyond all probable risk of contamination from without. No one must enter or leave it without official permission. If a death, other than by accident, occurs on an aircraft arriving from abroad, or a case or suspected case of infectious disease (other than tuberculosis or venereal disease), the craft must notify the airdrome medical officer or customs officer, preferably by wireless, before arrival. Infected aircraft or those coming from places infected with cholera, plague, smallpox, typhus or yellow fever, or those with rodents dying aboard, must not discharge passengers, crew or cargo until the medical officer has inspected them and declared them free from infection. The usual procedure is to isolate in a hospital persons showing evidence of infection, while the contacts may be liberated after giving names and addresses of destination and they will then be under the surveillance of the local health officer. Adequate vaccination against smallpox or inoculation against cholera or yellow fever exempts from isolation. In cases of infection the aircraft is disinfected. In aircraft from the tropics and subtropics disinsection is performed to prevent the introduction of mosquitoes carrying the germs of yellow fever, dengue or malaria. If there is a case of cholera or the aircraft has come from a cholera infested area, fish, fruit and vegetables must not be unloaded.

YELLOW FEVER

Special precautions are taken against yellow fever, as the mosquito vector (*Aedes aegypti*) is prevalent in the tropics and subtropics. The fear of spread to India by air traffic is considered so great that the government has taken additional precautions. Passengers from yellow fever areas in Africa are not permitted to enter India until nine days has elapsed since their departure, and aircraft are not permitted to fly direct to India from such areas unless in possession of a certificate from the Egyptian Quarantine Board stating that the aircraft has been disinfected. In common with the Dutch East Indies and the Sudan, India prohibits the importation of yellow fever virus even for research purposes. The danger is considered so great that the following precautions are recommended: 1. Provision of anti-malarial airdromes in all yellow fever districts. They have been established at Kano, Malakal and Khartoum. The last is not in a yellow fever area but is a clearing place for air traffic. 2. A campaign against *Aedes aegypti*. This has already produced a marked decline along the air routes of Africa. 3. Possible requirement that intending passengers may be required to go into isolation for six days before embarkation. In Nigeria seven days' notice of flight is demanded, so that it can be decided whether quarantine in a mosquito proof hut is necessary. 4. A change of aircraft during journeys, which lessens the risk of transporting infected insects beyond a certain point. 5. The destruction of mosquitoes in aircraft, which has occupied the attention of experts in various countries. Deskito, a water-soluble pyrethrum concentrate, diluted from ten to fourteen times, is used as a spray by Imperial Airways. 6. Inoculation against yellow fever of all who intend to travel by air through yellow fever districts.

Little Traffic in Dangerous Drugs in Great Britain

The report on the traffic in opium and other dangerous drugs in Great Britain, which has been presented to the League of Nations by the government, deals with the year 1938 and states that drug addiction is not prevalent. The number of persons known to the central office during the year as addicted to narcotics was 519—246 men and 273 women. Of these 134 were physicians, two were dentists, five were pharmacists and two were veterinary surgeons. The percentages of addiction to different drugs were morphine 78.7, diacetylmorphine 13.2, medicinal opium 0.4, dihydromorphinone 0.6. During the year

three physicians, six pharmacists and one veterinary surgeon were convicted of offenses against the Dangerous Drugs Act. There was no evidence of any organized illicit traffic. Such cases of illicit import as were discovered were individual attempts, usually by oriental seamen, to bring in small quantities for their own use or that of compatriots resident here. Two attempts to smuggle in small quantities of prepared opium by means of the newspaper post were discovered. No single seizure of opium exceeded 12 ounces.

The Blood Tests Bill

The report of the House of Lords select committee on the bastardy blood tests bill recommends that it should become law. The committee is satisfied that the risks of error have been reduced to negligible proportions and that the tests would prevent injustice. Replying to the criticism that to make it mandatory on the court to order a blood test would be an interference with the liberty of the subject, the committee feels that, in view of the possible injury to reputation, these cases require special treatment. An "approved person" should be nominated by the court to take tests. He should be a physician who is also a pathologist, but blood samples for the test could be taken by a physician who is not an approved person. In view of possible nervousness on the part of the woman, this physician should, if possible, be her regular medical attendant. In all cases in which an applicant refuses to undergo a blood test, her application should be dismissed.

Evacuation of the Wounded by Air

Air forces will play a greater part in this war than in any previous one, and a new development, which has already begun, is evacuation on a large scale of the wounded by air. The British air force has in France complete units for the evacuation to England of casualties and patients with all possible speed by air. Up to the present all the casualties have been evacuated in this manner. In addition the medical services have a complete system whereby in an emergency the blood transfusion units can be carried by air right into the front line. If necessary, transfusion can be performed while the wounded man is being carried in air transport.

PARIS

(From Our Regular Correspondent)

Oct. 18, 1939.

Occupational Diseases of the Skin

During the sessions of the Journées internationales de pathologie et d'organisation du travail, held last May in Paris, the official report of which has just been published, Flandin and Rabeau presented a paper on occupational dermatoses based on 1,000 cases among workers of different trades. Occupational diseases of the skin constitute from 40 to 70 per cent of all occupational diseases. Diseases of the skin are among those which incapacitate longest for work. Their etiology is often obscure. In some cases diseases of the skin are clearly caused by the occupation alone; in most other cases it is difficult to determine the particular toxic, infectious, mechanical or allergic agent. In other cases cutaneous diseases of a mycotic, nutritional or diathetic nature may be modified by scratching or by local infections, syphilis, diabetes, tuberculosis, lichen, ichthyosis and so on. In this confusion, recourse is finally had to cutaneous tests, which require much time. However, improvement in technique will no doubt bring about a shortening of the time. One of the great difficulties in applying these tests is the large number of allergens that have to be considered. Flandin and Rabeau described their modification of Bloch's technique. They stress the need of attention to detail as well as the experience required for the correct interpretation. The susceptibility of individuals changes in the course of the years and even with

the seasons. There are also sensitization thresholds, activating substances and physical factors such as heat, humidity and light by which allergy is more or less aided in its evolution. Fifty per cent of cutaneous diseases are purely exogenous; 30.35 per cent in men and 19.74 per cent in women are designated as seborrheas, a term used with reservation because of its possible provisional nature; 26.28 per cent of cutaneous diseases in men and 25.28 in women are of bacterial or mycotic origin. Substances used for cosmetic purposes cause 20 per cent of eczemas in all occupations.

Trachoma and Rickettsia

At a meeting of the Académie de médecine, Georges Blanc, R. Pages and L. A. Martin brought to the support of the analogies invoked between trachoma and Rickettsia infections the results of new attempts to transmit trachoma to *Macaca sylvanus*, an animal especially sensitive to the disease. They were able to bring about five transmissions from monkey to monkey and thereupon from monkey to man and from man to monkey, the trachoma agent losing nothing of its virulence in the course of its successive inoculations. The infections induced in man by the virus of the baboon is of the acute type observed by all investigators in the infection provoked by the human virus. Of the three types of Rickettsia so far described in trachoma infection, that of Busacca-Poleff, that of Cuénod-Nataf and that of Foley-Parrot, only the last one was found by Blanc and his collaborators. Prowazek's bodies were frequently but not always observed in the experimental trachomas which they caused. They appeared between the twentieth and the thirtieth day and lived only a few days. Although they have the appearance of "parasites," the fact that they are relatively rare in trachomatous monkeys invites caution in speculating on their pathogenic role.

The Epidemicity of Acute Rheumatic Fever

Blechmann, at a recent session of the Société médico-chirurgicale des hôpitaux libres, reported the results of his observations on acute rheumatic fever, a subject proposed by the military health service for further study.

Epidemicity is one of the characteristics which render acute rheumatic fever a disease entity. Its cause is not yet known, or at least there is no proof of the part played by the different germs so far isolated. However, cases of familial rheumatism are sufficiently numerous and indicate a hereditary predisposition or suggest a direct transmissibility. Besides, several outbreaks, evidently of an epidemic character, have been reported, notably during the World War, both in military circles and in isolated groups in which soldiers were in prolonged casual contact with civilians. The argument often advanced for the seasonal nature of the disease cannot be entertained. The fact that the infection is not fatal and that its mechanism is not known does not constitute an argument against its infectiousness. Its transmission seems to require a direct and prolonged contact. The point of entry seems to be the pharynx. There is, at least according to army medical statistics, a close parallelism between the curves of acute rheumatic fever and angina, which is often considered the only symptom of it. The connection between acute rheumatic fever and scarlet fever is still clearer. The effect of salicylates on the manifestation of scarlet fever and rheumatism emphasizes the community of origin between the two maladies. Conditions such as humidity and overfatigue clearly are to be reckoned among the inducing causes. Billings and Rosenow, on the other hand, stress the role of focal infections of a buccal nature. Many authors ascribe this rheumatic infection to a variety of streptococci such as *Streptococcus viridans* or *Streptococcus haemolyticus*. Others have described numerous germs or associations of germs the specificity of which has not yet been demonstrated.

BERLIN

(From Our Regular Correspondent)

Oct. 25, 1939.

War Closes Some Universities

All universities have been closed except those of Berlin, Vienna, Munich, Leipzig and Jena. According to reports, these five have been selected to continue their teaching and research functions and to maintain their departments of physical culture unimpaired. Several technical schools and art schools also will remain open. The other universities will accelerate and complete their examinations before closing. Students disqualified for military service and those not yet called to the colors are required to continue their academic studies at once. Medical students who have passed the medical examinations but have not served their year of training in the clinics, a training that is still obligatory and a prerequisite to full medical recognition, are to be granted their diploma at once. The same regulation applies to druggists. The *National-Sozialistische Parteikorrespondenz* now issues a special wartime service which it calls "The Inner Front." In this war time service Dr. Conti, state leader of physicians, has announced that one third of the 38,000 physicians practicing in Germany have been mobilized for military purposes. A noticeable shortage of physicians has set in since the discriminatory policy against Jewish physicians was enforced. This shortage has in no wise been corrected. The remaining two thirds are to be distributed equally over the rest of the country. All physicians with a private practice are required to assume duties that may be assigned to them, such as those connected with the sick funds and with public hygiene and health. To prevent financial discriminations, physicians who previously were not admitted to sick fund and public health practice may now, and under certain conditions are required to, serve where the sick fund medical association assigns them. Moreover, the number of practicing physicians has been enlarged by granting medical students completing their last semester their diploma. In this way the government is able to make 2,400 "physicians" available at once who are to assist in military and other hospitals and thus make it possible to release older physicians for home service; many married female physicians who were prohibited from practicing during the last years have offered their services and are now in active practice.

Besides, hospital services of an auxiliary nature have been organized in sufficient number according to Dr. Conti's announcements. Official appointments of physicians have also been made for the "liberated and occupied" districts and the necessary measures inaugurated to prevent the occurrence of epidemic diseases. Dr. Conti admitted that, because of the withdrawal of many physicians from ordinary life and their assignment to military needs, medical services would here and there be curtailed. He advised that physicians be called only if really needed and that patients consult the physicians as much as possible at their office.

Physicians also may establish themselves at new locations only with official permission. This measure has been taken to protect the interests of physicians called to the front. No permanent certificate is therefore granted for sick fund practice during the continuation of the war.

The use of automobiles, prohibited during war times without official permission, is conceded to practicing physicians. Official permit is signaled by a red corner on the automobile plates issued.

Membership in the sick funds is assured during war times and members are relieved of paying assessments. Their needs are taken care of at the front by military physicians, while their families continue to enjoy the medical service provided by the sick funds.

Hospitalization Figures for 1937

According to a report just issued, the average proportion of hospital beds in the combined hospitals of the nation at the end of 1937 was 92.7 per cent to 10,000 inhabitants, as compared with 92.2 per cent in 1936 and 92 per cent in 1935. Likewise the number of patients treated in the combined hospitals increased by about 245,000, totaling about 5,400,000, equivalent to 799.3 to 10,000 inhabitants. The number of hospitalization days increased from 180,000,000 to 186,000,000, equivalent to 3.1 per cent, although the days for which the individual patient was hospitalized fell, on the average, from 34.9 to 34.3 per cent; in 1935 the percentage stood at 35.2. The higher figures for hospital services in 1937, as compared with those of 1936, are to be ascribed to increased patronage and not to a prolonged hospitalization of the average patient. The average in percentages between 1932 and 1937 is represented by 71.6 as against 81.1. Individual figures vary according to location, size of the hospital, time of the year and the type of the hospital. On an average, about 510,000 beds were in daily use in the combined hospitals and 250,000 in the general hospitals. The mortality rate for all hospitals was the same as that for the preceding year, namely 4.9 per cent. Of every 100 deaths occurring in Germany in 1932, 26.7 per cent occurred in hospitals; in 1937 the number rose to 28 per cent. Hospitalized obstetric cases increased by 8 per cent over those of the preceding year. Artificially induced miscarriages in hospitals had decreased in 1936 by about 28 per cent over those of 1935, manifestly in consequence of a more rigorous diagnosis; in 1937 there was a further decrease of 16.4 per cent. The frequency of births in hospitals showed a further increase, as discernible from these figures: 251 per thousand in 1935, 270 in 1936 and 293 in 1937.

Tuberculosis and the Army

Serial x-ray examinations have been increasingly used in Germany in the case of factory employees and members of formations. They are also employed largely in the army. Detailed information is now furnished by Surgeon Major Dr. Deist in the *National-Sozialistische Parteikorrespondenz*. Serial x-ray examinations were begun in the army in 1931. In 38,041 tests there were found sixty-four cases of active (0.168 per cent) and sixty-six of inactive pulmonary tuberculosis (0.74 per cent). In the old national army of 100,000 men the greatest number of active cases was not discovered in the first year but in the fifth and ninth years of service. However, since the introduction of general military service the picture has undergone some modifications so that men in the first and second years of service are somewhat considerably involved. Besides irradiations, prophylactic roentgenograms are to be taken of every recruit immediately on admission into the army. A medical check-up is made in his second year with special attention given to those with inactive or suggestive indications. On discharge from military service at the end of the second year another prophylactic test is made. Regular army soldiers are to be given x-ray examinations annually. These plans and measures may not be carried out during the present war conditions but deserve attention for the principles of social service involved.

Measures Governing Alcohol Control

Official regulations dealing with alcohol control were reported in THE JOURNAL September 16, p. 1144. The new regulations, designed to prevent traffic accidents, relate to employees of street cars and require that every employee report for duty in a sober condition; that is, free from the effects of alcohol or other stimulants. The consumption of alcohol is prohibited not only during working hours but while the employee gets himself ready or performs official errands. New regulations also prohibit any reference to the effects on health in the advertising of brandy products. Health references prohibited include reference to dietetic effects such as "promoting diges-

tion," "stimulating the appetite," and "beneficial." Pictorial representations of this kind also are banned. Only in case of bitters and liqueurs that possess a sufficiently high content of herb extracts and ingredients of bitters, reference may be made to such an effect in the advertisements; but it must be limited to moderate expressions.

Personals

As reported in THE JOURNAL Dec. 17, 1938, page 2318, Franz Volhard, professor of internal medicine in Frankfurt on the Main, retired at the end of 1938. Prof. William Nonnenbruch, director of the second medical clinic at the German university in Prague, has been appointed as his successor. Nonnenbruch was a pupil of Morawitz, director of the medical clinic in Würzburg at that time. As early as 1917 Nonnenbruch made a reputation by his publication based on observations of kidney diseases in army campaigns. His further work was chiefly in the field of the pathology and clinical studies of kidney diseases and of water metabolism. In 1928 Nonnenbruch was called to Prague, where in addition to medical problems he devoted himself extensively to encouraging young men of German extraction to study medicine. Associate professor Schellong, of Heidelberg, was appointed as his successor at Prague.

ITALY

(From Our Regular Correspondent)

Sept. 30, 1939.

Congress of Medicine and Surgery

The fourth Congresso Medico-Chirurgico of Calabria was held recently; Prof. Rocco Jemma was president.

Prof. Roberto Falcone, who spoke on treatment of fractures, made the following suggestions: 1. In all cases of fracture it is advisable to make a careful x-ray examination in various projections before attempting any maneuver. 2. Anesthesia is indicated in certain cases in order to make an x-ray examination of the fracture, and in all cases to obtain a perfect reduction. 3. Early reduction of the fracture has a favorable influence on the healing process. 4. To apply traction and contra-extension it is advisable to resort to apparatus and special beds, as well as to apply direct traction on the bones in certain cases. 5. The limbs must be relaxed to prevent muscular tension. 6. A perfect coaptation should be maintained as long as necessary and, when indicated, transosseal fixation should be resorted to. 7. If a cast is applied it should have no lining and should not interfere with the functions of nearby muscles and joints. 8. The use of the limb must be regained as soon as possible to prevent muscular atrophy, articular rigidity and edema. 9. Physical therapy can be applied only after the inflammatory reaction has completely disappeared.

Marriages

TAUSBEE B. BEATTY, Margaretville, N. Y., to Miss Merle Virginia Wagon of San Bernardino, Calif., in Warren, Va., September 24.

RICHARD S. BLOOMER, Rockville, Ind., to Miss Betty Ann Glore of Greencastle in Indianapolis, October 28.

HENRY STUART BUREM, Kingsport, Tenn., to Miss Irene Marion Gormley at Johnson City, October 14.

RAY O. FESSEY, Nashville, Tenn., to Miss Louise Earls Scales of Columbia, Tenn., in October.

RICHARD BOXLEY BOWLES, Deltaville, Va., to Miss Elizabeth Billups of Mathews, September 30.

GEORGE NUGIER DES ORMEAUX to Miss Rosa Mary Orr, both of Lafayette, La., October 14.

MARGARET L. MAISOLL to Mr. Richard Newhouse, both of Morristown, Ind., October 26.

HERMAN ANFANYER, New York, to Miss Billie Rose Spencer of Troy, Miss., recently.

Deaths

DEATHS

1979

Foster Kyle Collins * Los Angeles; Medico-Chirurgical College of Philadelphia, 1899; associate professor of surgery, College of Medical Evangelists, and formerly professor of operative surgery; demonstrator and lecturer in surgery, Woman's Medical College of Pennsylvania, Philadelphia, 1901-1910; demonstrator of operative surgery at the University of California Post Graduate School, 1916-1926; member of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; past president of the Los Angeles Surgical Society; served during the World War; attending surgeon to the Hollywood Clara Barton Memorial Hospital, now known as the Presbyterian Hospital-Olmsted Memorial, and the Los Angeles General Hospital; aged 68; died, September 18, of cerebral hemorrhage.

James Harold Borrell * Buffalo; University of Buffalo School of Medicine, 1914; member of the House of Delegates of the American Medical Association, 1937-1939; president-elect and formerly vice president of the Medical Society of the State of New York; past president and treasurer of the Medical Society of the County of Erie; member of the American Urological Association; fellow of the American College of Surgeons; aged 47; member of the staffs of the Sisters Hospital, Deaconess Hospital and Lafayette General Hospital; past president of the staff of the Millard Fillmore Hospital, where he died, September 29, of spontaneous pneumothorax.

George Washington Wales Brewster, Boston; Harvard Medical School, Boston, 1893; member of the Massachusetts Medical Society, American Surgical Association and the New England Surgical Society; fellow of the American College of Surgeons; consulting surgeon to the Massachusetts General and Beth Israel hospitals, Boston, Milford (Mass.) Hospital, Leonard Morse Hospital, Natick, Mass., Brockton (Mass.) Hospital and the Chelsea (Mass.) Memorial Hospital; aged 73; died, September 26.

Harry Jay Brayton * Syracuse, N. Y.; Syracuse University College of Medicine, 1903; associate professor of clinical medicine (tuberculosis) at his alma mater; director of the Onondaga Health Association; superintendent of the Onondaga Sanatorium from 1915 to 1939; consultant in diseases of the chest, Syracuse Psychopathic Hospital and the Syracuse General Hospital; aged 58; died, September 20, of cerebral arteriosclerosis and cerebral hemorrhage.

E. Agate Foster, Patchogue, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1890; member of the Medical Society of the State of New York; president of the Suffolk County Medical Society; bank president; formerly member of the board of education and vice president; at one time mayor; aged 72; died, September 28, of carcinoma of the prostate and coronary thrombosis.

Seth Marshall Fitchet * Boston; Harvard Medical School, Boston, 1921; fellow of the American College of Surgeons; served during the World War; served in various capacities on the staffs of the Children's Hospital, Massachusetts General Hospital, New England Baptist Hospital and the Massachusetts Eye and Ear Infirmary, Boston, and the Josiah B. Thomas Hospital, Peabody; aged 52; died, September 26.

Frederick Henry Gunn * East St. Louis, Ill.; St. Louis University School of Medicine, 1909; fellow of the American College of Surgeons; past president of St. Clair County Medical Society and the Southern Illinois Medical Society; member of the surgical staffs of St. Mary's and Christian hospitals; aged 56; died, September 26, in the Temple University Hospital, Philadelphia, of carcinoma of the liver.

John McCrea Dickson * Gettysburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; fellow of the American College of Surgeons; served during the World War; for many years chief of the surgical service of the Annie M. Warner Hospital; on the staff of the Chambersburg (Pa.) Hospital; aged 50; died, September 15, of cerebral hemorrhage.

Frank Blinn Dorsey Jr. * Keokuk, Iowa; State University of Iowa College of Medicine, Iowa City, 1912; past president of the American Association for the Study of Goiter; secretary of the Lee County Medical Society; on the staffs of the Graham Protestant Hospital and St. Joseph's Hospital; aged 50; died, September 1, of acute coronary occlusion.

Chris E. Emery, Butte, Mont.; Chicago College of Medicine and Surgery, 1917; member of the Medical Association of Montana; past president of the Silver Bow County Medical

Society; served during the World War; formerly county physician; in the staff of St. James Hospital; aged 45; died, September 21, in a hospital at Pasadena, Calif.

Ernest Leland Davis * Springfield, Mass.; Tufts College Medical School, Boston, 1906; member of the American Roentgen Ray Society and the New England Roentgen Ray Society; served during the World War; on the staffs of the Springfield Children's and the Shriners' Hospital for Crippled Children; aged 67; died, September 10.

David Ralph Bowen, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1894; member of the American Roentgen Ray Society; past president of the Philadelphia Roentgen Ray Society; aged 67; served at various times and in various capacities on the staff of the Pennsylvania Hospital, Philadelphia, where he died, September 6.

David Maxwell Marks * Jersey City, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1916; served during the World War; served in various capacities on the staffs of the Hudson County Hospital, Secaucus, and the Fairmount Hospital; aged 46; was shot and killed, September 15, by an unknown assailant.

Richard H. Whalen, Tama, Iowa; Illinois Medical College, Chicago, 1905; Hahnemann Medical College and Hospital, Chicago, 1905; member of the Iowa State Medical Society; formerly physician in the Indian Service; at one time county coroner and health officer; aged 65; died, September 4, of coronary thrombosis.

Loran Ernest Orr * Springfield, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1907; coordinating epidemiologist to the state department of health; at one time superintendent of Cass, Logan, Mason, Menard and Sangamon counties; aged 56; died, September 10, of coronary thrombosis.

George Stevenson * Mount Morris, N. Y.; Jefferson Medical College of Philadelphia, 1903; member of the Association for Research in Nervous and Mental Diseases; aged 77; died, September 11, at the Mount Morris Tuberculosis Hospital of pulmonary tuberculosis and diabetes mellitus.

Thomas Manning, New Rochelle, N. Y.; Bellevue Hospital Medical College, New York, 1890; member of the Medical Society of the State of New York; aged 75; on the staff of the New Rochelle Hospital, where he died, September 5, of chronic nephritis, myocarditis and arteriosclerosis.

Nellie Schenck, Long Beach, Calif.; Eclectic Medical Institute, Cincinnati, 1889; Southwestern Homeopathic Medical College and Hospital, Louisville, Ky., 1899; on the staffs of the Seaside Memorial and Community hospitals; aged 77; died, September 11, of cardiorenal disease.

Edgar Kirkland Dun Van, Chelsea, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1897; member of the Iowa State Medical Society; aged 67; died, September 24, in the Mercy Hospital, Cedar Rapids, of coronary sclerosis.

James Edward Francis Cogan * Cleveland; Jefferson Medical College of Philadelphia, 1896; fellow of the American College of Surgeons; visiting ophthalmologist to St. Alexis Hospital; aged 68; died, September 22, of aortic stenosis and coronary sclerosis.

Gustave Arthur Childgren * Burlington, Iowa; University of Minnesota College of Medicine and Surgery, Minneapolis, 1892; member of the American Psychiatric Association; aged 74; died, September 17, in the Mercy Hospital of acute cardiac dilatation.

George Augustine Marion, Rochester, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; served during the World War; aged 70; died, September 14, in the Highland Hospital of carcinoma of the pancreas with metastasis.

John William Mann, Washington, D. C.; University of Pennsylvania School of Medicine, Philadelphia, 1917; member of the Medical Society of the District of Columbia; served during the World War; aged 45; died, September 28, of coronary occlusion.

Robert Q. Rowse * Sioux City, Iowa; Medical College of Ohio, Cincinnati, 1893; fellow of the American College of Surgeons; attending surgeon to St. Joseph's Methodist and Lutheran hospitals; aged 69; died, September 27, of coronary occlusion.

George E. Ellis, Dunkirk, N. Y.; University of Buffalo School of Medicine, 1891; formerly health officer and school physician; at one time on the staff of the Brooks Memorial Hospital; aged 75; died, September 26, of arteriosclerosis.

James Wiley Thomason, Midway, Ala.; University of Alabama School of Medicine, 1910; member of the Medical Association of the State of Alabama; for many years member of the county school board; aged 59; died, September 12.

Herbert Piercy Nottage, Ontario, Calif.; Harvard Medical School, Boston, 1886; member of the California Medical Association; served during the World War; aged 75; died, September 15, in the San Antonio Community Hospital, Upland.

Saul Alfred Cloutier, Reno, Nev.; School of Medicine and Surgery of Montreal, Que., Canada, 1901; served with the Canadian Army during the World War; aged 63; died, September 10, of myocarditis and cerebral thrombosis.

Marcus Solomon Oliver, Chicago; Northwestern University Medical School, Chicago, 1912; member of the American Urological Association; aged 54; died, September 11, of coronary thrombosis and chronic myocarditis.

Robert Moses Nichols, Sheboygan Falls, Wis.; Hahnemann Medical College and Hospital, Chicago, 1887; served during the World War; formerly postmaster; aged 76; died, September 30, of aortic insufficiency.

David Archer, Oshawa, Ont., Canada; Victoria University Medical Department, Coburg, 1889; University of Toronto Faculty of Medicine, 1890; L.R.C.P., Edinburgh, and L.R.C.S., Edinburgh, 1890; died, September 20.

Glenn Russell Ford, Endicott, N. Y.; Syracuse University College of Medicine, 1919; on the staff of the Ideal Hospital; aged 46; died, September 9, of duodenal ulcer, bronchopneumonia, nephritis and myocarditis.

John Hiram Wilson, Keokuk, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1907; aged 56; died, September 26, in St. Joseph's Hospital of an accidental gunshot wound.

Charles Emonual Eugene Pannaci, Coral Gables, Fla.; Columbia University College of Physicians and Surgeons, New York, 1900; served during the World War; aged 61; died, September 1.

Henry Paul Rhode, Green Bay, Wis.; College of Physicians and Surgeons of Chicago, 1894; aged 66; died, September 28, in St. Vincent's Hospital of myocarditis and appendiceal abscess.

Moses E. Haase, Cedar Rapids, Iowa; St. Louis Medical College, 1882; member of the Missouri State Medical Association; aged 77; died, September 10, of carcinoma of the bladder.

Sydney Abraham Stein, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; aged 70; died, September 29, of heart disease.

James A. Sparks, Ashland, Ky.; Kentucky School of Medicine, Louisville, 1900; on the staff of the King's Daughters' Hospital; aged 63; died, September 27, of coronary occlusion.

John Abraham Hoffman, New Holland, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1901; aged 66; died, September 12, in the Lancaster (Pa.) General Hospital.

Henry O'Keefe, Grand Forks, N. D.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1882; aged 81; died, September 2, in St. Paul, Minn., of bronchopneumonia.

Clinton B. Staley, Enfield, Ill.; Barnes Medical College, St. Louis, 1898; served during the World War; aged 68; died, September 22, as the result of a fall from his front porch.

James Harvey Craft, Bramwell, W. Va.; University College of Medicine, Richmond, Va., 1905; aged 65; died, September 24, of cardiovascular renal disease and uremia.

Blanche Leonora Heiss Sanborn, San Francisco; Hahnemann Hospital College of San Francisco, 1899; aged 70; died, September 27, of cardiorenal disease and arteriosclerosis.

John Ray Beatty, Butte, Neb.; University of Nebraska College of Medicine, Omaha, 1899; aged 64; died, September 30, in a hospital at Lincoln of coronary embolism.

Mathias C. Schenecker, Webster, S. D.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1894; aged 80; died, September 4, of carcinoma of the liver.

Milton Augustus Hardin, Norphlet, Ark.; St. Louis College of Physicians and Surgeons, 1907; member of the Arkansas Medical Society; aged 61; died, September 4.

Edward Napoleon Bywater, Grants Pass, Ore.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1903; aged 62; died, September 11.

D. C. Walker, Decatur, Ala.; Birmingham Medical College, 1905; member of the Medical Association of the State of Alabama; aged 62; died, September 8.

William Franklin Holmes, Brockton, Mass.; University of Michigan Homeopathic Medical School, Ann Arbor, 1891; aged 66; died, September 22.

John Gunnell Talbot, Burkesville, Ky.; Hospital College of Medicine, Louisville, 1897; served during the World War; aged 67; died, September 30.

Frank Hughes, Boston; Tufts College Medical School, Boston, 1910; aged 66; died, September 13, at his summer home in North Weymouth.

Erwin Walter Markham, Great Barrington, Mass.; University of Vermont College of Medicine, Burlington, 1899; aged 64; died, September 10.

Hugh Buck Nunn, Ripley, Tenn.; Kentucky School of Medicine, Louisville, 1893; for many years postmaster; aged 67; died, September 6.

William J. Kavanaugh, Brooklyn; Baltimore University School of Medicine, 1901; served during the World War; aged 59; died, August 22.

Franklin M. Skaggs, Ardmore, Okla. (licensed in Oklahoma under the Act of 1908); Confederate veteran; aged 55; died, September 19.

Albert C. Lusby, Brush, Colo.; Hospital College of Medicine, Louisville, 1898; aged 63; died, September 19, of coronary thrombosis.

John Craton Gambill, Ashland, Ky.; Hospital College of Medicine, Louisville, 1905; aged 54; died, September 24, of coronary sclerosis.

Benjamin A. Pyatt, Georgetown, S. C.; Medical College of South Carolina, Charleston, 1886; aged 77; died, September 12, of lobar pneumonia.

Arba Sherman Green, Lorain, Ohio; Cleveland Homeopathic Medical College, 1898; aged 69; died, September 19, of coronary thrombosis.

Robert W. McGehee, Yoakum, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1889; aged 77; died, August 10.

Edward Grigsby Moench, Belle Center, Ohio; Eclectic Medical College, Cincinnati, 1926; aged 38; died, September 8, of heart disease.

George Nicholas Waldeck, Huntington, W. Va.; Medical College of Ohio, Cincinnati, 1895; aged 67; died, September 24, of myocarditis.

Max Bresler, New York; Columbia University College of Physicians and Surgeons, New York, 1899; aged 71; died, September 15.

Elmore Oscar Smith, Kansas City, Mo.; Rush Medical College, Chicago, 1881; aged 88; died, September 28, of chronic myocarditis.

Charles Billington, Madison, Wis.; Boston University School of Medicine, 1903; aged 68; died, September 11, of myocarditis.

Ignatius George Moleski, Philadelphia; Temple University School of Medicine, Philadelphia, 1919; aged 45; died, August 31.

Charles Robert Magee, San Diego, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; aged 83; died, August 20.

James Hansford Davis, Temple, Texas; University of Nashville (Tenn.) Medical Department, 1898; aged 75; died, August 23.

Edward James Rice, San Francisco; University of California Medical Department, San Francisco, 1899; aged 63; died, August 7.

Henry E. Steen, New York; State University of Iowa College of Medicine, Iowa City, 1884; aged 82; died, September 15.

Lashley M. Gray, California, Mo.; St. Louis Medical College, 1882; aged 81; died, September 6, of arteriosclerosis.

John William Barnhill, Owensboro, Ky.; Hospital College of Medicine, Louisville, 1882; aged 77; died, September 11.

Ella Camp, Primghar, Iowa; Woman's Medical College, Chicago, 1890; aged 82; died, September 1, of senility.

Claude Clegg, Clarksdale, Miss. (licensed in Mississippi, 1911); aged 50; died, September 27, of heart disease.

Rowe R. Bunner, Fort Neal, W. Va.; Maryland Medical College, Baltimore, 1909; aged 56; died, September 4.

Amy L. Silvius, Cleveland; Cleveland University of Medicine and Surgery, 1897; aged 63; died, August 21.

Correspondence

HYPERSENSITIVITY TO PITUITARY

To the Editor:—A clinical note in THE JOURNAL October 14 by Dr. Walter McMann reports a case of hypersensitivity to solution of posterior pituitary. I would like to add a case of my own to the few that have been reported.

An octigravida aged 36 was seen by me in August 1934 for antepartum care. She made only this one antepartum call, at which time it was found that all previous labors had been normal and that all children were living and well. The present pregnancy had progressed without incident, and the estimated date of confinement was about September 7. On September 4 she was delivered of a normal male infant at 4:50 a. m. Following the second stage of labor she was given 1 cc. of solution of posterior pituitary intramuscularly,* which is my routine practice. On completion of the third stage she complained of generalized itching and moderate dyspnea. This became progressively worse, and she was given epinephrine for no other reason than that the picture appeared to be one of anaphylactic shock; I had no idea as to the etiology. The symptoms gradually cleared up and by noon she was quite well.

She became pregnant again in 1935 and on July 8, 1936, was delivered of a normal female infant. In view of her previous experience I gave her only 4 minims (0.25 cc.) of solution of posterior pituitary following completion of the second stage of labor. Her previous symptoms recurred, but in a mild form, and subsided promptly on administration of epinephrine.

Her tenth pregnancy began in 1939 and she was delivered of a normal female infant on October 14. She was given no solution of posterior pituitary at any time during or after labor, reliance being placed on Adair's ergonovine orally following completion of the third stage.

It might be noted, incidentally, that different brands of solution of posterior pituitary were used on the two occasions. The only physical disorders in this woman's history are obesity in 1936, at which time she weighed 248 pounds (112.5 Kg.) and at present cholecystitis with stones. The latter was proved by x-ray examination.

WAYNE C. RYDBURG, M.D., Brooten, Minn.

OXYGEN THERAPY

To the Editor:—The clinical lecture on oxygen therapy by Dr. M. A. Blankenhorn in the October 7 issue of THE JOURNAL is inadvertently and unfortunately misleading.

"Cyanosis is the main and only important indication for oxygen therapy in pneumonia." This opening sentence in the lecture does not take into account the fact that a grayish color to the face is generally indicative of the more severe types of anoxemia. Furthermore, in peripheral circulatory failure the capillaries of the skin are collapsed and a cyanotic hue may not be discerned in the presence of the most profound anoxia. In anemia there may be insufficient hemoglobin to provide a bluish color to the skin, although a marked decrease in oxygen saturation of the arterial blood may exist. Cyanosis may be considered a reliable indication for oxygen therapy in pneumonia only when it is present. There are other important indications for oxygen therapy, such as a pulse which is elevated out of proportion to the fever, dyspnea, restlessness and irrationality, abdominal distention, rapid shallow respiration; namely, the symptoms of anoxemia which are indicative of oxygen want and which Dr. Blankenhorn himself referred to as resembling the toxic effects of infection.

"Oxygen treatment may not be successful in relieving anoxemia for a number of reasons other than reasons of technic. It cannot succeed if too much lung is consolidated or obstructed by exudate. It cannot succeed if the circulation is failing or if there is toxic depression of the respiratory center by infection or drugs." These remarks do not take account of the fact that oxygen in physical solution in the blood is increased in proportion to the pressure or concentration of oxygen in the air breathed. Thus, at 50 to 60 per cent of oxygen concentration in the inspired air there is an increase of two and one-half to three times the normal physically dissolved oxygen. Furthermore, the hemoglobin even of a normal individual can be additionally saturated by 5 per cent. The summation of these two influences (not reckoning the additional oxygen which penetrates partially obstructed areas of the lung, which may be considerable) will increase the oxygen content in 100 cc. of blood by almost 2 cc. Since from 4 to 6 cc. of oxygen is consumed in 100 cc. of blood as it passes from artery to vein, an increase of 2 cc. has considerable physiologic significance. Reference to the oxygen dissociation curve indicates that a substantial elevation in oxygen tension takes place under these circumstances.

Oxygen treatment in the conditions referred to is frequently of great importance. Studies during the past decade have shown that a failing circulation, whether due to congestive disease, coronary thrombosis or peripheral circulatory failure, is especially aided by inhalation of oxygen enriched atmospheres (Barach, A. L., and Richards, D. W.: Effects of Treatment with Oxygen in Cardiac Failure, *Arch. Int. Med.* 48: 325 [Aug.] 1931. Levy, R. L., and Barach, A. L.: Therapeutic Use of Oxygen in Coronary Thrombosis, *THE JOURNAL*, May 3, 1930, p. 1363. Freeman, N. E.; Show, L. J., and Snyder, J. C.: The Peripheral Blood Flow in Surgical Shock, *J. Clin. Investigation* 15:651 [Nov.] 1936).

In toxic depression of the respiratory center by drugs oxygen treatment is also of value to prevent asphyxia, in some instances employed with carbon dioxide. The histotoxic anoxias, for example, produced by ingestion of alcohol, have been shown to be ameliorated by inhalation of oxygen (van Wulften, Palthe, P. M.: *Deutsch. Ztschr. f. Nervenhe.* 92:79, 1926. Barach, A. L.: The Action of Oxygen in Counteracting Alcoholic Intoxication, *Am. J. Physiol.* 107:610 [March] 1934. McFarland, R. A., and Barach, A. L.: The Relationship Between Alcoholic Intoxication and Oxygen Want, *Am. J. M. Sc.* 192:186 [Aug.] 1936).

It is my belief that oxygen tents should generally have 50 per cent oxygen rather than from 35 to 40 per cent, since these concentrations do not always raise the arterial oxygen saturation as near to the normal range as higher concentrations, and since the administration of very high concentrations of oxygen has been found valuable under certain conditions (Barach, A. L.: Methods and Results of Oxygen Treatment in Pneumonia, *Arch. Int. Med.* 37:186-211 [Feb.] 1926. Evans, J. H., and Durshodwe, C. J.: *Anesth. & Analgesia* 11:193 [Sept.-Oct.] 1932. Boothby, W. M.; Mayo, C. W., and Lovelace, W. R.: One Hundred per Cent Oxygen: Indications for Its Use and Methods of Its Administration, *THE JOURNAL*, August 5, p. 477. Fine, J.; Hermanson, D., and Frehling, S.: Further Clinical Experiences with Ninety-Five per Cent Oxygen for the Absorption of Air from the Body Tissues, *Ann. Surg.* 107:1-13 [Jan.] 1938). Oxygen may also be administered in conjunction with positive pressure, vaporized solutions of neosynephrin and epinephrine as well as with helium, but it is not my purpose to discuss the importance of oxygen therapy in pneumonia but rather to point out certain differences in emphasis or opinion in my views to those expressed in Dr. Blankenhorn's lecture.

ALVAN L. BARACH, M.D., New York.

POSTPARTAL CARE OF THE URINARY BLADDER

To the Editor:—At the annual session of the American Medical Association in 1939 TeLinde read a paper on the routine instillation of an ounce of a 1 per cent solution of mercurochrome into the bladder of gynecologic patients before they left the operating table. In this way he was able to reduce materially the incidence of postoperative catheterization. Since many patients have to be catheterized after delivery conducted under anesthesia, I determined to try TeLinde's plan in obstetrics. On my return from St. Louis I saw two patients being catheterized, one of whom developed a cystitis. I lost no time in putting the plan into operation. One hundred and fourteen obstetric patients, all delivered under an anesthetic, have been treated in this manner, and only two have been catheterized. One of these, I might say, had been in labor three days and had been dribbling urine for twenty-four hours before she was sent into the hospital. Her bladder was greatly distended. She complained more of the bladder pain than she did of the labor pains, and her physician had been giving her morphine to make it bearable. Had I been trying for a favorable record for the plan I should have omitted the instillation of mercurochrome into the bladder after delivering this patient. Nevertheless, it seems to be a simple and worthwhile addition to the delivery technic.

M. PIERCE RUCKER, M.D., Richmond, Va.

VERRUGA PERUANA

To the Editor:—In view of the editorial in *THE JOURNAL* July 15, page 235, in which reference is made to Dr. Trigo Arce having reported clinical cases of verruga peruana in the Yungas in 1935, it might be in order for one who has now spent nearly two years of continuous practice in the Yungas of Bolivia to give a little report on the possible presence here of this disease. I have not had an opportunity to communicate with Dr. Trigo Arce before making this report.

"Septique" or "tzerktiti" is one of those sneeze-cough-and-spit Aymara Indian words, and I would suggest that any one with false teeth trying to pronounce it for the first time do so in private. "Septique" or "tzerktiti" is used commonly by the Indians as the name for yaws or frambesia. Of course they do not always make exact diagnoses and at times may apply the term to cutaneous leishmaniasis or fungous cutaneous infections. This "tzerktiti" responds rapidly to neoarsphenamine, gives a positive Kahn reaction, does not usually produce a striking anemia unless associated with other disease, is not highly fatal and, if not treated, tends to run a chronic course of several years. The word "siete" I have heard less often and usually spoken of as "siete años" (seven years) and is applied to chronic sores that run a course of several years.

As I have stated before, I have practiced here almost two years now and I have not seen a case that I would suspect as being verruga peruana. My attention has been called to the disease, as several of our missionaries have contracted it in Peru and some have died. The Sanatorio y Hospital de Sud Yungas, of which I am at present medical director, has been in operation in Chulumani, the capital of the province of South Yungas, for about ten years. It draws its patients from both North and South Yungas as well as from the more outlying districts. Although I have gone over the records of the hospital for these ten years I have not found any cases even tentatively diagnosed as verruga peruana or Oroya fever. Our present head nurse, an American who has been here since 1934, states that she has not known of any cases here. The Peruvian pharmacist in town, José Keiffer, who has seen cases of the disease in the hospitals in Lima, Peru, and who has resided here since 1932, states that he has seen no cases here, nor has he heard of any. I have also asked several large property

owners who employ many peons, and they state that they have never heard of the disease.

Our climate, elevation and housing conditions compare favorably with other regions of the world where the disease is reported. We also have a large population of Peruvian Indians, but they come for the most part from the region about Lake Titicaca, where the disease is not generally known. In view of these facts it is possible that this illness might present itself here at some future date, but for the time being I believe it is one of the few diseases we have been fortunate in escaping here.

WALDO W. STILES, M.D., D.N.B.,
Chulumani, South Yungas, Bolivia.

VULVOVAGINITIS IN PREGNANCY

To the Editor:—We submit a few comments subsequent to those of Dr. H. Close Hesselstine with respect to our article "The Significance of Vulvovaginitis in Pregnancy" published in *THE JOURNAL* July 1, 1939, page 30.

All patients with symptoms and/or vaginal discharge had both the direct Sabouraud and the culture-transfer technic employed. The latter seemed to give a higher incidence of positive results and the incidence we reported was as we found it. Observations by one of us (E. G. W.) on 1,500 private patients shows a much lower clinical incidence.

The words "type of" should have preceded "lochia flow" in ascribing the postpartum disappearance of Monilia to the alteration in vaginal function. In our comment it is suggested that hyperestrinism with sequential vaginal changes in pregnancy may account for the appearance of Monilia in certain pregnant women. Inversely the rapid fall in estrogen results in glycogen-poor vaginal secretion during the time of lochia flow. Dr. Hesselstine is quite correct in criticizing the existence of any "lochia flow influence."

We are not of the opinion that oral thrush is necessarily a result of intrapartum infection from a mycotic vagina. We have encountered too many exceptions in this and other studies to believe it to be the rule.

The data reported are as they occurred in our study. There is no more finality in them than in other published data on the subject.

EDWARD G. WATERS, M.D.
EAKLE W. CARTWRIGHT, M.D.
Jersey City, N. J.

A SURGICAL PROCEDURE FOR ANGINA PECTORIS

To the Editor:—The report by Dr. Rupert B. Raney (*THE JOURNAL*, October 28, p. 1619) of a successful surgical procedure to relieve angina pectoris by cutting the efferent sympathetic fibers to the heart exclusive of the afferent fibers of the heart is confirmatory evidence of the experimental work which Mr. K. Jochim and I have recently reported (*Am. J. Physiol.* 126:395 [June] 1939) in which we demonstrated that the only coronary vasoconstrictor fibers present in the dog are adrenergic in character, tonically active and bundled in the sympathetic nerves. In our studies we did not find any cholinergic coronary vasoconstrictors in the vagi but only cholinergic vasodilators. It would appear, therefore, from the report of Dr. Raney that the innervation of the coronary arteries in man are similar to that reported by us in the dog. Hence, it is not necessary to assume, as the author did, that the sympathetic action of the coronary vessels is reversed in angina pectoris but rather that this is the innervation actually present in man. It would appear that, when angina pectoris results, the sympathetic coronary vasoconstriction may be exaggerated or, without exaggeration, that its effect is added to other constricting mechanisms, making it easier for severe coronary narrowing to occur.

LOUIS N. KATZ, M.D., Chicago

Queries and Minor Notes

QUERIES AND MINOR NOTES

1983

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ARRESTED TUBERCULOSIS

To the Editor:—What are the criteria for considering a case of pulmonary tuberculosis as arrested? I sought a position as medical officer in a government agency and was turned down because of pneumothorax. The reason was given that the condition of pneumothorax does not conform to the standards of an arrested state. Negative sputum for tubercle bacilli for three years under collapse therapy did not influence this ruling. I underwent pneumothorax. Exclusion of such persons from employment would therefore cause undue hardship to many who are apparently well. I should like particularly to know if the definition of the "arrested state" includes the pneumothorax condition.

M.D., New York.

ANSWER.—Pulmonary tuberculosis is usually considered arrested when the lesions are not causing constitutional symptoms and tubercle bacilli cannot be found in a concentrated specimen of sputum by microscopic examination, when the shadows on the x-ray film indicate that the lesions are stationary and there is no evidence of cavity formation. These conditions must be present over a period of six months, during the last two of which the patient has been taking exercise equivalent to two hours of walking daily. It should make no difference whether this so-called arrested state of the disease is brought about by the natural defense mechanism of the body alone, with or without strict bed rest, or by the aid of collapse therapy, such as artificial pneumothorax.

In some states, laws have been enacted which provide for the compensation of employees who fall ill from tuberculosis. Usually no provision is made whereby a person who has arrested or apparently cured pulmonary tuberculosis can sign a waiver for any subsequent illness from this disease. Most physicians now know that pulmonary tuberculosis frequently is a relapsing disease and that in many of our sanatoriums 25 per cent or more of the patients are there for at least the second time. While it is true that some persons control their tuberculosis so completely that it never reactivates, it is also true that many patients, no matter how well controlled their disease appears to be or what a good rating they have, will have one or more subsequent relapses. Such facts often make employers feel that it is not safe to employ persons who have had clinical pulmonary tuberculosis. Moreover, it is well known that certain complications may develop with artificial pneumothorax, particularly empyema, and whether it is due to mixed infection or to tubercle bacilli, the condition may result in a long period of illness and even require operation on the chest. While such complications do not develop in a high percentage of patients with artificial pneumothorax, yet there are enough of these to make the employer question the advisability of taking the risk.

True, five years is not an exceptionally long time for a patient to be treated by artificial pneumothorax. Indeed, Rist of the Laennec Hospital in Paris considers this the minimum time. However, the majority of his patients have moderately or far advanced disease when the treatment is instituted. In this country there are a good many patients who have been on pneumothorax ten and some twenty or more years. Usually, however, they are persons who had far advanced disease with large cavities when the treatment was begun, and they, as well as their physicians, are fearful of the condition which may exist if their lungs are allowed to reexpand; that is, cavities may not be permanently closed. They are thoroughly cognizant of the possibilities of complications like empyema, but they would rather take the risk of such complications than that of reactivated pulmonary tuberculosis with cavities and tubercle bacilli in the sputum. Usually when a person with artificial pneumothorax is entitled to the classification of "arrested" or "apparently cured" from the standpoint of absence from symptoms and from tubercle bacilli, good working capacity and the like over a sufficient length of time, the word "collapsed" is placed in parenthesis immediately after the terms indicating the classification. Most certainly the contention that the exclusion of persons who are able to work but who have artificial pneumothorax would cause hardship to many who are apparently well individuals is right. There are thousands of persons in the United States at the present moment whose disease is controlled by artificial pneumothorax so that it is no longer contagious and who are actually engaged in full time work; that is, they hold the same kind of position and perform their duties just as well as persons

sons who have never had pulmonary tuberculosis. As long as they are kept under close observation with reference to the contagiousness of their disease, to make certain that they do not become menaces to their associates and to make certain that new lesions do not appear in other parts of their bodies and jeopardize their future, there is no logical reason why they should not continue to work.

A patient who is given artificial pneumothorax treatment and has the area of disease under a good state of collapse usually is much safer from the standpoint of his associates and his own health than the person who has his disease brought under control by the defense mechanism of the body, aided only by a dietetic-hygienic regimen such as is practiced in a sanatorium or a hospital.

In some states tuberculosis is not rated as an occupational disease and therefore industrial commissions have no jurisdiction over it. When an employee blames an employer for the development of his disease, the case must be settled amicably or tried in civil court. Even in such states, many employers have become fearful of this disease because unjust claims have been made against them and even juries have rendered verdicts to their disadvantage. This has led to the requirement of many employers of adequate examination for tuberculosis of all employees before they are accepted for any kind of work. After all, this is the ideal procedure, for unsuspected tuberculosis will not be determined in this manner and the fraudulent employee will not be able later to force his employer to pay for something for which he is not responsible. At the same time the trustworthy person may suffer a hardship.

The problem encountered is serious. Numerous attempts are being made to rehabilitate persons with clinical pulmonary tuberculosis. It has been suggested that waivers be provided for tuberculosis in contracts of such organizations as the industrial and insurance companies, but this seems to involve legal technicalities which are difficult to solve. Certainly a movement is in order that would lead to a provision for employment of rehabilitated tuberculous patients with safety to them, their fellow employees and their employers, from the standpoint of their personal health, that of their associates and legal requirements.

FOOT POUNDS OF WORK OF HEART

To the Editor:—How much work in foot pounds will a normal heart of an average 150 pound (68 Kg.) man do in one hour when he is at complete rest, sitting, standing and doing heavy manual labor?

Fred T. Fox, M.D., Lawton, Okla.

ANSWER.—The calculation of the amount of work in foot pounds accomplished by a normal adult human heart in one hour is at best extremely crude. There are many factors that cannot be expressed adequately at the present time without extensive formulas and without more knowledge of various factors than are possessed at the present time, some of which it might be difficult to ascertain—such factors as the viscosity of the blood, the elasticity of the vessels, the velocity of the circulation, the effect of gravity and the duration of the cardiac cycle. However, a rough estimate may be made by taking three simple variables: the pulse rate, the blood pressure and the amount of blood expelled by the ventricles at each beat.

Assuming that at complete rest the left ventricle expels 60 cc., or 2 ounces, of blood per beat at a rate of 60 beats a minute (120 ounces, or 7½ pounds, a minute) at a mean arterial pressure of 100 mm. of mercury or 130 cm. of water, or 51 inches (4¼ feet) of blood, then the left ventricle accomplishes roughly 32 foot pounds a minute, which, multiplied by 60, is 1,920 foot pounds an hour. This, however, represents simply the work of the left ventricle. Meanwhile the right ventricle also is active, doing probably about half the work of the left. If then 960 foot pounds an hour for the right ventricle is added to the 1,920 foot pounds for the left, there is a total of 2,880 foot pounds for the two ventricles. It may be assumed that there is a little extra work carried out by the auricles too, which would give roughly about 3,000 foot pounds an hour for the heart muscle at rest.

At hard work the ventricle can put out probably at least 5 ounces per beat or two and one-half times as much as at complete rest. The pulse rate may be assumed to go up to about 100 instead of 60, and the blood pressure may increase 25 per cent. This would increase the amount of work accomplished five times, which would be equal for the whole heart to about 15,000 foot pounds an hour. The amount of work done when the man is sitting and standing would be close to the amount of work done with the man at complete rest. In fact, in the standing position, if carried out any length of time, there would be actually less work than at complete rest because of the effect of gravity in depleting the amount of blood coming

back to the heart and therefore the amount of work accomplished by the heart. It should be understood, however, that these figures are rough and that it would be impossible to calculate with great accuracy the amount of work done by the human heart.

MANDIBULAR NERVE AND REFLEX PAIN

To the Editor:—A man aged 29 has had a constant pain over the mastoid region for nearly two years. No precipitating cause can be elicited in the history or physical examination. He has had alcohol injections elsewhere followed by excision of second and third cervical nerve branches. I believe that the area is supplied by the great auricular and mastoid branch of the second small occipital nerves, and their excision should give relief. The patient complains of a reflex pain in the upper half of the entire face on that side. Any suggestions to throw light on the subject will be appreciated.

M.D., California.

ANSWER.—It is a popular misconception that the excision of the superficial sensory nerves in such a disorder will afford relief. There is, of course, some precipitating cause and it should be discovered. An old chronic sclerosing mastoid disease must be thought of and ruled out by x-ray and aural examinations. Arthritis of the temporomandibular joint must be thought of, for it could conceivably cause such a pain. Likewise, arthritic change around the foramina of exit of the second and third cervical nerves must be looked for. The mandibular nerve is notorious for the reflex pain which it may produce about the ear or in other parts of the area of supply of the trigeminal nerve; such pain may arise from a carious tooth, intra-oral chronic lesions or old low grade inflammatory foci some place in the trigeminal area. Fontaine and Leriche have suggested a role assumed by the upper cervical sympathetic nerves in just this type of pain, and their discussion should be referred to with the thought that treatment of the superior cervical sympathetic ganglion and the sympathetic nerves on the carotid artery with procaine hydrochloride might afford relief (Leriche, René: The Surgery of Pain, translated by Archibald Young, Baltimore, Williams & Wilkins Company, 1939).

CRACKING JOINTS

To the Editor:—A patient complains of a peculiar cracking noise in the different joints on motion. There is no evidence of arthritis, the history is clear, and laboratory data are negative. The only thing that might have a bearing on the symptoms is the fact that several years ago she had large infected tonsils; this condition was followed by cholera. No cardiac symptoms are present, nor is there evidence of joint involvement other than as stated.

D. F. Russell, M.D., Van Wert, Ohio.

ANSWER.—The condition of cracking or snapping joints is occasionally a source of much worry to sensitive persons. When this symptom is present alone, without pain, swelling or other evidence of arthritis, it is of no clinical significance. The cracking has been explained on several bases. Its pathogenesis is similar to that of the cracking that is made by children and occasionally by adults when the distal phalanx of a finger is suddenly pulled distally. The surfaces of interphalangeal joints which are suddenly pulled apart will cause a popping sound similar to, and perhaps produced in the same way as, the noise made by abruptly pulling the tongue away from the roof of the mouth. Just why this should occur more at certain times than at others in the same person or should be present to a high degree in some persons is not definitely known.

A roentgenogram, of course, should be taken to rule out the presence of loose bodies and a careful examination made to exclude other pathologic conditions. In the absence of these, however, the patient should simply be reassured that she has nothing to fear from this harmless symptom.

UNTOWARD EFFECTS FROM GONADOTROPIC SUBSTANCE

To the Editor:—Have there been any proved cases of premature epiphyseal closure when gonadotropic substance is given to the preadolescent child? Have any other permanent harmful effects been reported?

M.D., Nebraska.

ANSWER.—There is no published record of proved premature epiphyseal closure following the use of gonadotropic substance. Inquiry from several physicians who have made intensive studies in this field fails to reveal any knowledge of such premature osseous development. The possibility is recognized and has been the basis for caution in the use of large doses of gonadotropic substance before adult stature is achieved.

Other possible harmful aspects from the use of this factor would include the precocious production of adult size and activity of the male genitalia (Thompson, W. A., and Heckel, M. J.: Precocious Sex Development from an Anterior Pituitary-like Principle, THE JOURNAL, May 28, 1938, p. 1813).

TRICHOMONAS VAGINITIS IN YOUNG GIRL

To the Editor:—Please advise as to treatment of *Trichomonas vaginalis* vaginitis in a girl 7 years of age.

T. M. Watson, M.D., Greenville, N. C.

ANSWER.—If the child has no disturbing symptoms and only a slight discharge, all that is necessary is to keep the external genitalia clean by frequent washing with soap and water. If, however, there is true vaginitis, not only should soap and water be used liberally on the external genitalia but treatment must also be applied to the vagina. Since the vagina is small and the hymenal orifice tiny, no attempt should be made to cleanse the vagina except in refractory cases. A form of therapy which is simple and which can be carried out at home by the child's mother is the use of acidulated dextrose-lactose tablets as advocated by Karnaky, 0.3 Gm. (5 grains) each of boric acid, dextrose and lactose being sufficient material to make thirty tablets.

One of these tablets should be inserted into the child's vagina two or three times a day. This treatment is directed toward producing and maintaining an acid medium in the vagina. A medium in which *Trichomonas vaginalis* cannot survive. The tablets have a pH of about 3.

PALPATION OF ARTERY AND THROMBOSIS

To the Editor:—In palpating the brachial artery to determine its degree of sclerosis and tortuosity, one usually presses the walls of the vessel together. It has often occurred to me that some degree of trauma might be inflicted on the vessel by this maneuver, especially if it is superficial. Are there any reports of experimental or clinical studies to show whether intimal damage or even thrombosis can occur in this manner?

M.D., Tennessee.

ANSWER.—Trauma may cause a sclerotic plaque to project into the intima of an artery and thus cause thrombosis. However, as far as is known there is no report in which thrombosis has been produced by palpation of the brachial artery. Theoretically, thrombosis could follow such palpation in instances of atherosclerosis but actually the trauma is almost certainly too slight.

LEAD LINE IN BONES OF INFANTS FROM BISMUTH

To the Editor:—If a growing child with congenital syphilis is treated with bismuth compounds such as bismarsen, will the bones show a dense white line in x-ray films similar to a lead line at the growing ends of the bones? Will treatment with mercury produce such a line?

M.D., Massachusetts.

ANSWER.—The bones of infants treated with bismuth in the immediately neonatal period will show a bismuth line similar to that seen in the bones of the newborn of mothers who received treatment with bismuth during pregnancy. The effect is not seen in older children. The age at which it ceases to occur is not definitely known but probably is less than 1 year. Mercury causes no such effect.

SEAL RING CELLS AND FOURNIER'S SYNDROME

To the Editor:—In a case of scleroderma the presenter spoke about finding seal ring cells in the biopsy section. Will you kindly advise me what is meant by a seal ring cell? Also what is meant by Fournier's syndrome? I asked two syphilologists and got two diametrically different answers.

Albert S. Tenney, M.D., East Orange, N. J.

ANSWER.—The term "seal ring cell" has been used by Dr. Fred Weidman, of Philadelphia, to denote the atrophied fat cells which have assumed signet ring or seal ring shapes, as seen in scleroderma. In all probability "Fournier's syndrome" refers to the combination of interstitial keratitis and chronic painless swelling of the knee joints which sometimes occurs in late prenatal syphilis. It has been mentioned by Cole (Congenital and Prenatal Syphilis, THE JOURNAL, Aug. 21, 1937, p. 580).

TETANUS AND INSECT BITES

To the Editor:—In THE JOURNAL, September 2, page 964, appeared a question and answer on tetanus and insect bites or stings. This brings to mind a case of tetanus observed when I was a house officer at Massachusetts General Hospital. A man who was on the beach at Jamaica in the winter of 1931 had been bitten on the foot by sand fleas. He paid little attention to these bites, but when he was on the boat returning to Boston his jaws began to tighten and he was taken by stretcher to the hospital wards. I looked long and hard for the point of entry and finally discovered on area about the toe nail which measured 2 by 4 mm; this was excised by the surgeon, and cultures yielded tetanus bacilli. After massive doses of antitoxic serum the patient recovered. This is the only case of its kind that I have heard about or seen.

Earle M. Chapman, M.D., Eastern.

Texas June Report

NATIONAL BOARD OF MEDICAL EXAMINERS
SPECIAL BOARDS

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination held at Austin, June 19-21. The examination covered twelve subjects and included 120 questions. An average of 75 per cent was required to pass. Two hundred and six candidates were examined, 194 of whom passed and twelve failed. The following schools were represented:

STATE AND TERRITORIAL BOARDS

School	PASSED	Year Grad.	Per Cent
Chicago Medical School.....	(1937) 75, 75, 79,	(1938)	75
Rush Medical College.....		(1938)	83
University of Illinois College of Medicine.....		(1939) 75.5,	78
State University of Iowa College of Medicine.....		(1937)	77.1,
(1938) 81.4, 83.3			
University of Louisville School of Medicine.....		(1933)	84.1
Tulane University of Louisiana School of Medicine.....		(1939) 81.7,	84
University of Maryland School of Medicine and College of Physicians and Surgeons.....		(1937)	81.9
St. Louis University School of Medicine.....		(1939)	80
Washington University School of Medicine.....	(1933) 86.2,	(1935) 78.6,	82.6
Duke University School of Medicine.....		(1939)	76.2
University of Tennessee College of Medicine.....		(1939)	78
Baylor University College of Medicine.....		(1939)	75,
76.6, 76.8, 77.6, 78, 78, 78.2, 78.2, 78.2, 78.3, 78.9, 79, 79, 80, 80, 80, 80, 80.2, 80.3, 80.3, 80.3, 80.5, 80.7, 81.1, 81.2, 81.4, 81.5, 81.5, 81.6, 81.7, 81.8, 81.9, 81.9, 82, 82, 82, 82.1, 82.2, 82.4, 82.4, 82.5, 82.7, 83, 83, 83, 83.2, 83.3, 83.3, 83.4, 83.5, 84, 84.1, 84.1, 84.6, 84.7, 84.8, 85, 85.5, 85.6, 86, 86, 86.7, 87, 87, 88.3, 88.6			
University of Texas School of Medicine.....		(1937)	77,
(1938) 84.4, (1939) 75.6, 77.3, 77.6, 77.6, 77.7, 78.2, 78.7, 79, 79, 79.8, 80.3, 80.5, 80.7, 80.8, 80.9, 80.9, 81, 81.1, 81.2, 81.3, 81.4, 81.5, 81.6, 82, 82, 82.1, 82.1, 82.2, 82.3, 82.4, 82.4, 82.5, 82.6, 82.6, 82.6, 82.6, 82.6, 82.6, 82.7, 82.7, 82.9, 83, 83, 83.1, 83.1, 83.1, 83.2, 83.2, 83.3, 83.3, 83.3, 83.4, 83.5, 83.5, 83.6, 83.6, 83.7, 83.8, 83.8, 84, 84, 84.3, 84.6, 84.8, 85, 85, 85, 85.5, 85.8, 85.9, 86, 86, 86, 86.4, 86.4, 86.5, 86.5, 86.5, 86.5, 87.1, 87.3, 87.6, 87.7, 88.7, 89.6, 90			
Universität Basel Medizinische Fakultät.....		(1934)	75
Universität Bern Medizinische Fakultät.....		(1937)	77
Osteopaths* 77.6, 77.7, 77.7, 78, 78.2, 78.3, 78.3, 79.8, 80.3, 82.3, 82.4, 83.5, 84, 84.3, 85.6			

School	FAILED	Year Grad.	Number Failed
Meharry Medical College.....		(1937)	1
Baylor University College of Medicine.....		(1939)	1
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....		(1924)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....		(1926)	1
Hamburgische Universität Medizinische Fakultät, Ham- burg.....		(1937)	1
Escuela Médico Militar, México.....		(1922)	1
Osteonaths*			6

Fifty-five applicants were licensed by reciprocity and one applicant was licensed by endorsement on July 31. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....		(1936)	Arkansas
Denver and Gross College of Medicine.....		(1905)	Washington
University of Colorado School of Medicine.....		(1937)	Colorado
"	"	"	Virginia
"	"	"	Mississippi
"	"	"	S. Dakota
"	"	"	Illinois
"	"	"	Indiana
AEOLIAN Medical College, College of Physicians and Surgeons.....		(1903)	Illinois
State University of Iowa College of Medicine.....		(1924, 1929)	Iowa
University of Kansas School of Medicine.....		(1936), (1938)	Kansas
Louisiana State University Medical Center.....		(1938)	Louisiana
Louisiana State University School of Medicine.....		(1939, 2)	Louisiana
Tulane University of Louisiana School of Medicine (1931, (1934), (1937), (1938, 4) Louisiana			
Baltimore Medical College.....		(1905)	Penna.
University of Michigan Medical School.....		(1936)	Michigan
University of Minnesota Medical School.....		(1933), (1935)	Minnesota
Creighton University School of Medicine.....		(1927), (1933)	Nebraska
University of Nebraska College of Medicine.....		(1934)	Kansas
University and Bellevue Hospital Medical College....		(1909)	New York
Unversit.....			Ohio
Western.....			Ohio
Univ. of Jefferson.....			Oklahoma
Mcharry.....			W. Virginia
Unversit.....			Tennessee
Unversit.....			Tennessee
(1937, 3), (1938) Tennessee			
Vanderbilt University School of Medicine.....			Tennessee
Baylor University College of Medicine.....			Louisiana
University of Virginia Departm.....			Virginia
University of Western Ontario.....			New York
Université de Genève Faculté de Médecine.....		(1935)	New York
Universität Zurich Medizinische Fakultät.....		(1935)	New York
Osteopaths.....		Colorado, 2, Michigan, Ohio,	Oklahoma

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
Northwestern University Medical School.....		(1939) U. S. Army
* Examined in medicine and surgery.		
† Licensed to practice medicine and surgery.		

† Licensed to practice medicine and surgery.

Book Notices

Operative Orthopedics. By Willis C. Campbell, M.D. Cloth. Price, \$12.50. Pp. 1,154, with 845 illustrations. St. Louis: C. V. Mosby Company, 1939.

At last we have a book that lives up to its title. The volume is intended for the orthopedic specialist, the industrial surgeon and the general surgeon. It is written out of the experience of a small group who have had tremendous experience and excellent guidance by an administrator and capable technician. The book should be well received by orthopedic surgeons, industrial surgeons and general surgeons. The author has correlated the mechanical and surgical principles of orthopedic practice and has emphasized the practical physiologic principles. The choice of material is fine and the presentation, composition and organization of the book are excellent. The author has drawn freely from the literature, and his choice is most acceptable. Operations are described and grouped according to the diseases for which they are most applicable. The chapter on surgical technic includes preparation before and after treatment; there are also chapters on apparatus and surgical approaches.

Some of the features of the book deserving special mention are the sections on arthroplasty, stabilization, joints and the treatment of malunited and ununited fractures. There is an interesting diagrammatic presentation of calcium metabolism; also a handy table of blood and urine changes in bone diseases, including serum calcium and phosphorus and serum phosphatase. A long chapter covers apparatus, plaster casts, splints and skeletal traction. Another long chapter concerns low grade disorders of joints, including arthritis, backache, sciatica, facetectomy, section on the piriformis muscle and section on the iliotibial band. One of the especially good sections is that on arthroplasty, toward which the author has contributed so much classic work. He is one of the pioneers and one of the international authorities on this subject.

Traumatic lesions of the joints are discussed, including internal derangements of the knee, disturbances and injuries to ligaments around the knee and osteochondritis dissecans. Dislocations are described in detail. The section on fractures is excellent. The chapter on malunited fractures is probably one of the features of the book. To those who know the literature the wonderful contributions of the author on malunited fractures are excellent. The section on delayed union and nonunion of fractures is good, also the section on acute and low grade disorders of the bones, including osteomyelitis. Noteworthy too is the material on tumors of bones, joints and soft tissue, which cover well these aspects.

Favorable comment is due the composition, format and beautiful character of the majority of the illustrations. Special mention should go to Dr. Hugh Smith for his collaboration. The publishers may be congratulated for beautiful work with the marvelous material with which they dealt.

A Visual Motor Gestalt Test and Its Clinical Use. By Lauretta Bender, M.A., M.D., Senior Psychiatrist, Psychiatric Division, Bellevue Hospital, New York. Research Monographs No. 3, American Orthopsychiatric Association. Lawson G. Lowrey, M.D., editor. Cloth. Price, \$3.50. Pp. 176, with 75 illustrations. New York: American Orthopsychiatric Association, 1938.

This monograph brings together and expands Dr. Bender's previous publications on visual motor gestalt function. The author assumes a familiarity with the classic teachings of gestalt psychology, which are not reviewed in the book. She defines the gestalt function as "that function of the integrated organism whereby it responds to a given constellation of stimuli as a whole; the response itself being a constellation, or pattern, or gestalt." The material offered is based on studies of psychiatric patients, of normal adults and children by use of a series of patterns first devised by Max Wertheimer. Bender has selected nine of Wertheimer's original patterns and has studied the variations in capacity to copy these patterns dependent on differing levels of maturation or growth in the visual gestalt function and in organically or functionally determined pathologic states.

The first part of the book is devoted to theoretical considerations. In the second chapter the author observes the stages

of maturation the child passes through in achieving visual motor experiences enabling him to read and write and to perceive as does the adult. The responses of small children to the Wertheimer patterns and the spontaneous sidewalk drawings of children are here studied. In the child of 2 at first scribbling is a motor activity which may acquire some significance after production. By motor experiment patterns eventually are produced that may resemble the desired one. An enclosed loop "is the basis of all perceived form." The child tends to persevere in reproduction of any one learned pattern and initially to reproduce this whatever figure is offered as a stimulus. Between the ages of 4 and 7 there is rapid differentiation of form. The author traces the increasing accuracy in reproducing size and form and in motor control with advancing age. Movement and perception cannot be separated and "form in the perception of children . . . is the outgrowth of motion."

The author comments that the child's earliest play activities and spontaneous drawings constitute experiments in form and in spatial and temporal relationships. She concludes that the child gets satisfaction out of his new experiences which is complete enough for the given age of maturation; that there is a continuous reaching out for new experiments in which the child freely participates, so that a continuously expanding "gestaltung" is both experienced by and produced by the child.

The responses of low grade mentally defective persons to the visual patterns are utilized for the further study of development of visual motor patterns. The most primitive patterns are analyzed in detail. It is emphasized that some tendencies to reproduce the patterns are present at the three year level but that perceptual motor capacities which appear only at higher intellectual levels are functionally associated with some of the gestalt principles. Tendencies to revert to the more primitive patterns are always present.

A study of maturation in the primitive child is based on drawings obtained from native African children. Her drawings of designs from the army performance tests were utilized and were analyzed in accordance with the gestalt principles used by the author. Details of seven levels of accomplishment are described. The author concludes that the unschooled native children with no previous experience with paper and pencil copy the forms as well as do average American born and educated children. Spatial orientation must then be thought of in terms of the organization of the perceptual motor patterns, and the different maturation levels are alike in the "primitive" and the civilized child.

Movement and temporal factors are studied in the final two chapters of the theoretical part of the book. The factors that determine the gestalt are the stimulating pattern, the motility of the visual field which determines spatial relationships, the temporal factor, the motor reaction pattern of the individual and his attitudes toward the experience. These factors are inseparable but constitute "a total process which is the response of the whole organism to the total situation."

The second section of the book consists of eight chapters in which the visual motor gestalt function is studied clinically. Eight cases of organic brain disease in which sensory aphasia was conspicuous are reported. The studies show that "the gestalt response principles are never fixed but are the integrative response of the personality-as-a-whole in any given situation." The tendency to revert to more primitive patterns with brain injury and the orderly course of recovery of function in accordance with the laws of developmental maturation are demonstrated. Disturbances in the visual motor gestalt function in dementia paralytica, alcoholic psychosis and acute confusional states are reported; a chapter is devoted to schizophrenia and one to manic depressive psychosis. In the schizophrenics "the fundamental disturbance of splitting" is expressed by a dissociation in the gestalt figures. Fragmentation and perseveration of parts, micropsia, dissociation by spatial separation and bizarre responses were noted in the schizophrenic. Manic depressive patients, on the other hand, evidence much less disturbance of the gestalt function, their productions reflecting inhibition or compulsive meticulousness, at times florid embellishments in manic states.

Of particular interest is Dr. Bender's standardization of the gestalt function in a performance test for children. The responses of 800 nursery school and school children to the Wertheimer figures have been used for the standardization. The author regards the test as of value as a test of maturity of performance.

in visual motor gestalt function between the ages of 4 and 11 years. A summarizing chart is presented, useful in determining the maturation level of individuals whose mental age is not above 11 years.

Analysis of the performances of mentally defective persons leads to the conclusion that the multiple causes of mental defectiveness may be classified as simple retardation in maturation, specific disabilities in the field of language, "dissociative phenomena which distort the whole personality," impulse disturbance, perceptual disturbances and confusional disturbances. The author concludes with reports on the use of the test in the study of malingering, in the Ganser syndrome and in the study of psychoneurotic individuals.

This book will be useful to physicians who are interested in problems of development and growth. The test devised by Dr. Bender will doubtless prove of clinical value as a performance test yielding specific information relative to perceptual functioning otherwise not readily available. It should prove to be particularly useful in diagnostic studies of retarded children and those suspected of being retarded. Where disturbances are primarily in the field of emotional development, the test will be of limited usefulness.

Die Hämaturie und ihre Behandlung. Von Privatdozent Dr. Rudolf Chwalla. Die Urologie in Einzeldarstellungen. Herausgegeben von Professor Dr. H. Boeminghaus. Boards. Price, 4.20 marks. Pp. 64. Leipzig: Georg Thieme, 1939.

In this monograph the author considers hematuria thoroughly. He stresses the importance of hematuria as a symptom of some underlying pathologic condition and states that the presence of blood in the urine always calls for a cystoscopic examination; that hematuria may be due to general disease processes outside the genito-urinary tract, as well as due to disease in the genito-urinary tract. He emphasizes the importance of following a definite routine in each case, which should include (1) demonstration of the presence of blood in the urine, (2) localization of the origin of the blood, (3) the diagnosis of the pathologic condition that makes the hematuria, and (4) the treatment. As a rule the experienced physician can recognize gross hematuria with the naked eye; he may be able to recognize even the presence of small amounts of blood in the urine. When doubt exists, one must resort to the use of the microscope and chemical tests. Changes in the color of the urine may be mistaken by the patient for the presence of blood, and some of the factors responsible are discussed.

The author stresses the importance of obtaining a comprehensive history and discusses its value, and he also calls attention to some of the important facts that may be obtained from a careful history. This is illustrated with statements showing some of the general causes of hematuria. Next in order is a careful urologic history, and special emphasis is given to the value and the information obtained from such a history. During the physical examination of the patient with hematuria, especial attention should be paid to the nutritional state of the patient, the appearance of the mucous membrane, heart and lungs, and so on. The various bits of information obtained by a careful physical examination are mentioned and discussed from the possibility of how much information can be obtained that will aid in making a presumptive diagnosis before resorting to the various special methods of examination.

The special methods of examination are discussed in detail. Anterior and posterior urethroscopy, cystoscopy, chromocystoscopy, ureteral catheterization, x-ray examination and retrograde and intravenous pyelograms are presented. Much discussion is presented regarding the technique of these various procedures. Attention is called to the fact that a kidney which shows disturbance in function may not necessarily be the cause of the bleeding and that the bleeding may have its origin in latent and unrecognized disease in the opposite kidney.

The cause of the hematuria is presented under three headings: 1. Hematuria due to general disease processes. Among these he mentions hemorrhagic diathesis, the various forms of nephritis, acute infectious diseases and chemical intoxications. Although lesions of the renal vessels are rare, they may be the cause of profuse bleeding and one must consider them in the differential diagnosis; they include embolism and thrombosis of the renal artery, aneurysm, thrombosis and thrombophlebitis of the renal vein. 2. Hematuria due to primary lesions of the genito-urinary

system. The author stresses the frequency of malignant tumor as a cause of hematuria. As one would expect in a monograph of this kind, lesions of the urinary tract that make hematuria are given careful detailed discussion and are given a good deal of space. 3. Hematuria in infancy and childhood. Owing to the rarity of the condition, this phase of the subject receives short but detailed discussion.

The author discusses the treatment of hematuria under the following headings: general measures that are directed toward controlling or stopping the bleeding, various forms of local instrumental measures, and the appropriate measures to relieve the underlying pathologic condition which is causing the bleeding.

One is impressed by the long list of drugs recommended (many proprietary).

Getting Ready to be a Father. By Hazel Corbin, General Director, Maternity Center Association, New York, N. Y. Cloth. Price, \$1.25. Pp. 48, with illustrations. New York: Macmillan Company, 1939.

This book, by the general director of the Maternity Center Association in New York, is dedicated to the men who attended the first class for expectant fathers at the Maternity Center Association. It is written in narrative form, describing what happens to the fetus from month to month, the processes of labor and the attitude of the husband toward these processes. It describes the choice of a doctor and of a hospital and also tells what to do about grandmothers and grandfathers and diapers. It tells how to build a crib at home and how to fix up a nursery. There is even complete information to help the father in nursing the baby in every way except by supply of breast milk. There are also pictures which might as well have been omitted for all that they teach. Intelligent men do not need books of this kind except for a few hints which can be included in 300 words of text. The kind of men who need this book will never buy it. There is much to be said, however, for the holding of classes for expectant fathers where the right kind of teachers and lecturers are available.

Alcohol and Human Life Being Partly a Revision of "Alcohol and the Human Body," by the late Sir Victor Horsley and the late Dr. Mary Sturge and Others. By Courtenay C. Weeks, M.R.C.S., L.R.C.P. With foreword by Sir Thomas Barlow, F.R.C.P., M.D., F.R.S. Second edition. Cloth. Price, 6s. Pp. 455, with 20 illustrations. London: H. K. Lewis & Co., Ltd., 1938.

The first edition of this book was published during 1928. The present edition is revised and enlarged. All profits from the book are to be devoted to educational work. The author says that alcoholic indulgence is still the greatest enemy Britain has to fear. His book is, of course, an argument for temperance and prohibition, preferably the latter. It provides massive data regarding the effects of alcohol on life, always with a tendency toward the worst that it does and with little to say about its values. A chapter called "Alcohol and the Duration of Life" is devoted to an analysis and dissection of the writings of Raymond Pearl on the same subject and comes to the conclusion that Pearl is wrong and has not established his case. The book is unfortunately not quite up to date, even in making the best possible use of material distinctly favorable to its point of view. In other words, it is an attempt at the use of scientific data for propaganda, which must inevitably result in something that is not quite scientific.

Hypertension and Nephritis. By Arthur M. Fishberg, M.D., Associate in Medicine, Mount Sinai Hospital, New York City. Fourth edition. Cloth. Price, \$7.50. Pp. 779, with 41 illustrations. Philadelphia: Lea & Febiger, 1939.

In its latest edition, this popular and authoritative textbook has been thoroughly revised. In previous editions the author managed to include all current information on the subject which was reliable, and this edition is no exception. Many important contributions have been made in the five years since the previous edition was published and the author has included most of them. The additions are fundamental contributions to the subjects and justify a new edition. The following are some of the important subjects which have been added: perirenal azotemia and the fundamental role of decreased blood flow in the pathogenesis; the mechanism and the pathogenesis of hypertension and its important complications; Goldblatt's important contribution; recent additions to our knowledge of kidney function tests, and the role of acacia and concentrated blood serum in the treatment

BOOK NOTICES

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of edema. In spite of the comprehensive presentation of experimental and scientific aspects of the subject, the author has not neglected the practical points in management. The practitioner will get just as much value from this book as those interested in the more scientific phases of the subject. This feature was always present in previous editions. The book justifiably enjoys a widespread popularity among students and practitioners as an authoritative source of practical and scientific information on nephritis and hypertension. The new edition perpetuates this reputation.

Manual of the Diseases of the Eye for Students and General Practitioners. By Charles H. May, M.D., Consulting Ophthalmologist to Bellevue, Mt. Sinai and French Hospitals, New York. Sixteenth edition, revised with the assistance of Charles A. Perera, M.D., Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York. Cloth. Price, \$4. Pp. 515, with 387 illustrations. Baltimore: William Wood & Company, 1939.

That this comprehensive, thorough and interesting volume has passed through sixteen American editions with many reprintings, has been through eight British editions and has been issued in Spanish, French, Italian, Dutch, German, Japanese, Chinese and Portuguese, for the most part in more than one edition, would seem to leave little in the way of comment. The chapters concerning glaucoma, the lens, the retina, the optic nerve and errors of refraction have been rewritten. Additions in the text have been the inclusion of the visual standards for operating motor vehicles as approved by the Section on Ophthalmology of the American Medical Association. Six color plates have been added. Because of the practical and consistent scope of this work, the careful and meticulous adherence to sound fundamentals of the author and the characteristic reproductions of eye diseases, a critical reading fails to reveal many—if any—obvious errors. A few of the illustrations, because of the modern trend, might be replaced by those more familiar to the student of today. The usefulness of this well known textbook needs no comment.

The March of Medicine: Selected Addresses and Articles on Medical Topics 1913-1937. By Ray Lyman Wilbur, M.D., President of Stanford University, Stanford University, California. Cloth. Price, \$2.75. Pp. 280. Stanford University Press, 1938.

Here, under the print of the Stanford University Press, is a collection of selected addresses and articles on medical topics by Ray Lyman Wilbur, published between 1913 and 1937. Some of these articles appeared in medical periodicals; many of them, however, were delivered as casual addresses before lay organizations. Many of them are intimately associated with Dr. Wilbur's work in the medical field. The book provides also a bibliography of the writings of Dr. Wilbur from 1902 to the time of this publication. Many of the addresses concerned particularly with medical education reflect the position of the author as chairman of the Council on Medical Education and Hospitals of the American Medical Association. Readers will find in this book much of inspiration and stimulus, presented in a literary style that is distinctive and strong. The essays reveal the wide range of interests of the author and his leadership in American medicine.

Physiologie et pathologie du tissu osseux. Par René Leriche, professeur au Collège de France. Paper. Price, 100 francs. Pp. 459, with 65 illustrations. Paris: Masson & Cie, 1939.

The book covers the first annual lectures by the author as professor at the Collège de France. His fundamental idea is to show that bone is an important physiologic unit in the service of the "milieu intérieur" and not simply a mechanical support for the body. It constitutes a reserve interposed between the active calcium and the tissue calcium without which the body could not maintain its equilibrium. Thus in both health and disease affecting calcium metabolism the calcium of bones is in an incessant state of movement. This is true both in general and in local diseases of the skeleton as well as in injury and experiments affecting it. He discusses both the lysis and the deposition of calcium in disease processes in terms of general calcium metabolism. The work is of distinctly a philosophic character involving a great deal of theory as well as clinical and experimental observation and should be of the greatest interest to those interested in the fundamental aspects of the physiology and pathology of bone.

Recent Advances in Medical Science: A Study of Their Social and Economic Implications. By Sir Edward Mellanby, K.C.B., M.D., F.R.C.P., Secretary to the Medical Research Council. The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939. Boards. Price, 75 cents. Pp. 62. Cambridge: University Press; New York: Macmillan Company, 1939.

This is the Rede Lecture, delivered before the University of Cambridge in April 1939, beautifully printed and bound for permanent literary collections. Brief mention of the trend of scientific advance is followed by a study of the effects of medical discovery on social life and also on hospital and other practice. Most significant is the chapter on medical knowledge as the limiting factor in public health schemes. Here the author says that the whole position of state action in health matters wants clarifying; sentiment and public appeal, associated with particular lines of action, ought to be eliminated, and each proposition ought to be considered only from the point of view of the results to be expected from administrative schemes in terms of saving lives and affording increased efficiency to individuals. Dr. Mellanby is convinced that medical science has almost "shot its bolt" as far as its beneficial effect on the population as a whole is concerned. He feels that the problems of the future are biologic in character, involving largely control of growth of population.

Claude Bernard, Physiologist. By J. M. D. Olmsted, Professor of Physiology, University of California. Cloth. Price, \$4. Pp. 272, with 11 illustrations. New York & London: Paul B. Hoeber, Inc. (Harper & Brothers), 1938.

To every student of physiology the name of Claude Bernard is as familiar as that of most of the presidents of our country. Especially welcome, therefore, is this appreciation of the great physiologist, written understandingly by one who is himself a physiologist and who is at the same time capable of evaluating Claude Bernard as a man. The only previous book-length biography of Claude Bernard in English was that of Sir Michael Foster. In preparing this book, the author consulted many original sources, including letters, and he is able to give a picture of the great physiologist better than any description heretofore available. The volume is inspirational and at the same time most instructive, because the fundamental contributions of Claude Bernard in every medical field are still a source of reference in the reports of modern research. The author has carefully evaluated the contributions of Bernard in each of the various fields, and he concludes with an estimate of the contribution of the great French physiologist to philosophy. The book is supplemented by an excellent bibliography and an index.

Ideal Weight: A Practical Handbook for Patients. By W. F. Christle, M.D. Cloth. Price, 5s. Pp. 111. London: William Heinemann, Ltd., 1938.

To the great number of books already available regarding reduction of weight for those who are obese, comes this volume from a British publisher. It contains the kind of data that many people require regarding caloric intake and the amounts of energy necessary to use up the calories. Few people realize that three lumps of sugar provide enough energy for a one mile walk and that you can play nine holes of golf on a medium size potato. The author provides brief discussions of the fundamental facts regarding food and includes a discussion of the various types of food, such as appetizers, cereals and beverages. He concludes with a table of foods and the amount of calories available from ordinary portions, giving no attention whatever to the proteins, carbohydrates, fats, mineral salts and vitamins, which obviously must be given the most careful consideration by those who want to diet healthfully. There are many better books available in America for less money.

A History of Women in Medicine from the Earliest Times to the Beginning of the Nineteenth Century. By Kate Campbell Hurd-Mead, M.D. Cloth. Price, \$6. Pp. 569, with 70 illustrations. Haddam, Conn.: Haddam Press, 1938.

The average man will not want to read as much about the history of women in medicine as is here provided; namely, some 500 pages. In her various chapters the author takes us from medical women in ancient times down through the middle ages and through the seventeenth and eighteenth centuries. The book is immense in its detail and must have required

many hours of research. She gives the story of early medical practitioners among women in the United States and even the stories of those two famous charlatans Mrs. Mapp and Jane Stevens. Through an excellent index the book enables any one interested in any aspect of the work of women in the field of medicine to find here the data that he will require. The author writes in a forthright manner without much embroidery, so that the book is not easy to read, but it is unquestionably the most complete and authentic work of its kind available. Obviously, it has been impossible for the author to tell the history of women in medicine without repeating much of the history of medicine itself. Thus the reader is enabled to trace the record of discovery and the manner in which women participated in the advancement of medical science.

The Evolution of Chronic Rheumatism with Treatment to Correspond: The Preventive Clinic as a First Line of Defence. By R. Fortescue Fox, M.D., F.R.C.P. Founded on a Lecture Delivered at Margate, at the Congress of The Royal Institute of Public Health and The Institute of Hygiene, May, 1937. Paper. Pp. 26, with 5 illustrations. London: H. K. Lewis & Co., Ltd., 1938.

Here the etiology of rheumatism is discussed. The treatment advocated includes particularly the use of sulfur waters and the use of baths, but little is said about pathology.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Amputation of Leg Attributed to Negligent Treatment of Fracture; Effect of Covenant Not to Sue.—The plaintiff fractured his left leg and was sent to the Seaside Hospital in Long Beach, Calif. The treatment there administered was unsuccessful and the leg was later amputated. Thereafter the plaintiff sued the two physicians who attended him, the hospital and the superintendent of nurses of the hospital, contending that the physicians were negligent in using too tight a cast and that the other defendants were negligent in not promptly advising the physicians of the discovery of this fact.

During the course of the trial, a claim superintendent for the insurance company representing the hospital and the nurse reached an agreement with the counsel for the plaintiff whereby for a consideration of \$6,000 the plaintiff executed a covenant not to sue the defendants represented by the insurance company. Thereafter the trial proceeded against the two physicians until on their motion the trial court directed a verdict for them. From the resulting judgment, the plaintiff appealed to the district court of appeals, second district, division 2, California, which affirmed the judgment of the trial court. The plaintiff then appealed to the Supreme Court of California.

There was competent evidence, said the Supreme Court, to necessitate a submission of the case to the jury. The fracture was reduced and the cast applied about 10 a. m. Sunday, August 9. One of the defendant physicians visited the plaintiff at 11:30 that same morning. He did not see him again nor communicate with him in any way until 8 p. m. When the physician left the plaintiff on Sunday morning he gave instructions to the nurses as to what they should do in an emergency resulting from a tight cast. Meanwhile, in the afternoon, the patient felt such severe pain that narcotics were administered, and his toes appeared swollen and a dark blue. The physician partially split the cast Sunday night, but the plaintiff continued to suffer great pain, and the swelling and discoloration continued. The condition of the plaintiff's leg became increasingly worse and required continual treatment until the amputation became necessary. A properly qualified medical witness for the plaintiff testified in response to a hypothetical question that the care of the plaintiff following the original treatment was not up to the standard of care and skill in the locality. He specifically criticized the failure to have constant after-care and observation of the leg when the

rigid cast was applied and testified that provision should have been made to notify the physician of the changes in condition which would have made it possible to open the cast much earlier. This expert testimony, the court commented, was enough to make a prima facie case, and the cross examination and conflicting views of the witnesses for the defendants raised only questions of credibility for the jury.

Two other medical witnesses called by the plaintiff corroborated the expert testimony previously given that the cause of the injury was a cast that was too tight. These physicians were asked hypothetical questions as to whether the conduct of the defendant physicians constituted due care, and an offer of proof was made to the effect that they would testify that it did not. The trial court, however, sustained objections to the questions on the ground that the witnesses were current practicing in Los Angeles and could not testify as to the standard of care in Long Beach, in which community the present case arose. The Supreme Court, however, could see no justification for such a narrow view. The cities of Long Beach and Los Angeles, the court pointed out, are in the same county; they are contiguous communities, both metropolitan in character, and their business centers are only about five miles apart. There is reason in the general requirement that the medical expert must be familiar with the standard of care in the particular locality in order that the standards of widely separate localities with different practices may be excluded. But to make the exclusion rest arbitrarily on a geographical line separating two cities of the same county with almost identical kinds of medical service would, in the opinion of the court, be a misuse of the rules of evidence and an unjustified emphasis on empty technicalities. Common knowledge, as well as the testimony of the physicians on both sides, convinced the court that the method used in treating the particular kind of fracture involved in this case was one in use throughout the world. And there was testimony to the effect that long prior practice in Los Angeles County, including Long Beach, showed that there was no difference in the treatment in the two communities. Both on principle and under the authority of the court was satisfied that the exclusion of the proffered testimony was error.

An expert witness for the defendants testified that the patient's leg was suspended in a "Böhler fracture frame" and that the witness had studied under Dr. Böhler and used his textbook and that his, the witness's, opinion was in part based on the book. The plaintiff's counsel then sought to cross-examine the witness by use of Dr. Böhler's book, and the trial court sustained objection to the impeaching question. This was improper, the Supreme Court said, for the rule against admission of such works as direct evidence is subject to the qualification that textbooks relied on by an expert witness may be used as a foundation for impeaching cross-examination.

The defendant physicians contended that the original for the defendants were sued as joint tort-feasors, or wrong-doers, and that the agreement resulting in the dismissal of the case against the hospital and nurse destroyed the plaintiff's cause of action against the other two defendants. They undertook to uphold the trial court's decision on the theory that the agreement constituted a release. But, said the Supreme Court, the agreement was entitled "Covenant Not to Sue and Covenant Not to Sue Further." It recited that the named defendants desired "an agreement and covenant not to sue and a covenant not to sue them or either of them further" or prosecute "any suit or suits now pending against them." It stated that the plaintiff "promises and agrees that he will not sue and/or sue further" the said defendants and that he covenanted and agreed to hold them harmless from any liability arising out of the accident or treatment. It concluded with the statement that the plaintiff did not waive any claims against the other defendants. This instrument, the court said, was unmistakably intended to constitute a covenant not to sue. Unlike a release, a covenant not to sue one joint tort-feasor does not relieve the others.

The judgment of the trial court directing a verdict for the defendants was therefore reversed.—*Lewis v. Johnson* (Calif. 80 P. (2d) 90; 86 P. (2d) 99.

Accident Insurance: Death of Donor During Blood Transfusion as Accidental Death.—The beneficiary obtained a judgment in the United States district court for the Eastern District of Virginia on a life insurance policy which provided double indemnity benefits if the insured died by reason of bodily injuries effected exclusively and wholly by external, violent and accidental means. The insurer appealed to the United States circuit court of appeals, fourth circuit.

A child of the insured was a patient in a hospital and was in need of a blood transfusion. The insured, then 34 years of age, finding that his blood was suitable, submitted himself for the purpose. He went to the hospital and walked up three flights of stairs to the operating room. The physician took his blood pressure, examined his heart and found him to be normal. The physician washed the insured's arm with antiseptic, applied a tourniquet and injected a needle into a vein, whereupon, before a tablespoon of blood had been withdrawn, the insured died. The undisputed evidence was that the insured was in good health at the time, that the operation was performed according to the customary and approved routine, that every act of the physician and of the insured was voluntary and intentional and that nothing unforeseen, unusual or accidental occurred in the manner in which the operation was performed. In short, although the death was a totally unexpected result, the acts which preceded it were done with due care and with specific intent. The physician who undertook to perform the transfusion operation, according to the appellate court, was of the opinion that "the death was caused by shock although he was not certain that it was not caused by heart failure."

The law of Virginia as declared by its legislature or by its highest court is decisive in this case, said the federal court. In *Ocean Accident & Guarantee Corp. v. Glover*, 165 Va. 283, 182 S. E. 221, the insured died from septicemia caused by an infection carried into the blood stream when he picked a pimple or boil inside his nose with a knife or needle. The Supreme Court of Appeals of Virginia in that case held that the death of the insured was effected by accidental means within the coverage clause of the policy involved. The decision was based on the idea that the word "accidental" in the policy was used in the ordinary and popular sense as meaning "happening by chance or not according to the usual course of things"; and since septicemia was not the probable consequence of the insured's act, recovery under the policy was justified. In the present case, the insurer contended that the only unexpected and unlooked for circumstance was the result, that is, the sudden death of the insured, whereas in the *Glover* case the means whereby the injury and death of the insured was produced may be fairly regarded as accidental because death followed the totally unintended and unexpected introduction of a germ into the body of the insured. To the circuit court of appeals, however, the distinction was not a valid one, because the insured in the *Glover* case voluntarily exposed himself to the risk of infection involved in picking the boil with a sharp instrument.

The circuit court of appeals, therefore, on the strength of the *Glover* case, agreed with the district court that the insured's death in this case was caused by bodily injuries effected exclusively and wholly by external, violent and accidental means within the meaning of the insurance policy, and the judgment for the beneficiary was affirmed.—*American Nat. Ins. Co. of Galveston, Tex., v. Belch*, 100 F. (2d) 48.

Malpractice: Negligence in Diagnosis of Hip Fracture.—The appellee injured his right hip and the appellant physician, after making a roentgen examination, diagnosed the injury as an impacted complete fracture of the surgical neck of the femur and treated it as such. The patient, however, continued for several years to have trouble with the hip and finally consulted another physician, who discovered that the shaft had slipped past the head of the femur for a distance of about 2 inches, resulting in only a fibrous union. The patient then brought suit and obtained a judgment in the United States district court, District of Idaho, eastern division, against the physician who had first treated him, the appellant in this case, the judgment being based principally on the finding that the physician diagnosed and treated the injury as an impacted fracture when the fracture was unimpacted. This judgment was reversed by the United States circuit court of appeals, ninth

circuit, because in the opinion of the court there was not sufficient evidence to warrant a submission to the jury of the question of whether or not the physician was negligent in making the diagnosis of impacted fracture.—*Moore v. Tremelling*, 78 F. (2d) 821; abstr. J. A. M. A. 106:1685 (May 9) 1936.

The case was tried a second time, the patient again obtained a judgment and the physician again appealed to the United States circuit court of appeals, ninth circuit.

The evidence was conflicting, said the court of appeals, as to whether or not there was negligence in the diagnosis and treatment of the fracture, but there was ample evidence on which to submit that question to the jury. There was testimony by the patient, his son and son-in-law, who were present at the time of the examination of the patient by the physician, and testimony by the patient's daughter that his right foot everted, or rolled over. On the other hand, the physician testified that the foot did not evert or roll over but agreed with all the other experts that if the foot did in fact evert the diagnosis should have been that the fracture was unimpacted. There was testimony that according to the standard of medical practice at Paris, Idaho, several roentgenograms should have been taken at once at different angles to determine the nature of the fracture and that other roentgenograms should have been taken later, one when the plaster cast was applied and another when it was removed. The physician took only one roentgenogram at the time of his diagnosis and none later. Expert evidence was given that the amount of pain, of mobility and of crepitus, if any, should have indicated to a practitioner of ordinary skill whether or not the fracture was impacted. Another expert witness testified that from his examination of the roentgenogram taken by the appellant if the foot was rolled over or everted the fracture was an unimpacted one. A roentgenologist testified that in his opinion from an examination of the roentgenogram taken by the appellant the fracture was unimpacted. A physician who practiced in a locality similar to Paris, Idaho, testified that from examination of a roentgenogram taken under his supervision some two years after the injury the fracture appeared to have been unimpacted. He testified that the recognized practice in diagnosing an unimpacted fracture was to take several roentgenograms, sometimes as many as three or four views, and that it was necessary to use a great deal of care in the manipulation of any injured hip, "until you have had your pictures and know just what has happened." With reference to evidence tending to show that the result would have been better had there been no negligence in treatment or diagnosis, the court said there was definite testimony by expert witnesses which justified the submission of the question to the jury.

After reviewing the entire record, the court of appeals could find no prejudicial error in it and the judgment in favor of the patient was affirmed.—*Moore v. Tremelling*, 100 F. (2d) 39.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Section, American Laryngological, Rhinological and Otological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Annals of Internal Medicine, Lancaster, Pa.

13: 385-562 (Sept.) 1939

- Significance of Postprandial Glycosuria in Treatment of Diabetes Mellitus with Protamine Zinc Insulin. I. M. Rabinowitch, Montreal.—p. 385.
- Family Outbreak of Type V Pneumococcus Infections: Clinical, Bacteriologic and Immunologic Studies. J. W. Brown and M. Finland, Boston.—p. 394.
- Electrocardiographic Observations in Cardiac Surgery. H. Feil and P. L. Rossman, Cleveland.—p. 402.
- *Vitamin C Requirement in Rheumatoid Arthritis. M. G. Hall, R. C. Darling and F. H. L. Taylor, Boston.—p. 415.
- Postoperative Progressive Exophthalmos with Low Basal Metabolic Rate. S. Ginsburg, New York.—p. 424.
- Occurrence and Clinical Significance of Hemoconcentration. V. H. Moon, Philadelphia.—p. 451.
- Bacteriology of Endocarditis: Report of Two Unusual Cases. M. S. Shilling, Baltimore.—p. 476.
- *Observations on Experimental and Clinical Use of Sulfapyridine: II. Treatment of Pneumococcal Pneumonia with Sulfapyridine. P. H. Long and W. B. Wood Jr., Baltimore.—p. 487.
- Clinical Manifestations of Various Types of Right Sided Heart Failure (Cor Pulmonale). I. C. Brill, Portland, Ore.—p. 513.
- Some Professional and Social Trends in American Medicine. I. Abell, Louisville, Ky.—p. 523.

Ascorbic Acid Requirement in Rheumatoid Arthritis.—Hall and his associates determined the ascorbic acid content of the blood of fifty-six patients with rheumatoid arthritis as compared with twelve normal individuals on a similar dietary regimen. Of the fifty-six patients fourteen showed an ascorbic acid level in the plasma of 0.8 mg. or higher per hundred cubic centimeters, which is within the accepted normal range. Nine had values between 0.5 and 0.8, whereas thirty-three had levels below 0.5 mg. Five of the patients who had plasma levels above 0.8 mg. had supplemented the hospital diet at the time of the survey with sufficient citrus fruits or orange juice to account for an additional daily intake of 80 mg. of ascorbic acid. Ten of the twelve normal subjects had levels of ascorbic acid in the blood plasma ranging between 0.9 and 2 mg. per hundred cubic centimeters and two had values of 0.6 and 0.25 mg. respectively. The patient with the lowest level of ascorbic acid stated that he rarely ate fruits or uncooked vegetables included in the diet. Studies on the requirements of an arthritic individual for ascorbic acid showed that this was between 100 and 200 mg. daily or between two and four times that required by a normal person. None of the arthritic patients showed symptoms associated with scurvy itself in spite of the fact that many had ascorbic acid levels below that usually present in scurvy. After eight months, during which time the patients were given ascorbic acid daily and their blood was known to be saturated with the vitamin, no clinical improvement which could be attributed to the ingestion of the acid was observed. Some patients improved during this period but others continued unchanged or became worse as judged by the condition of their joints, hemoglobin or failure to gain weight and slowing of the erythrocyte sedimentation rate. No increase in the erythrocyte count was found in any of the patients, although occasionally sporadic but slight increases in the reticulocytes were observed. The study indicates that the ordinary hospital diet was inadequate in its ascorbic acid content to supply the increased demands of the rheumatoid arthritic patient and may lead to a general revision of diets in institutions devoted to the care of this disease.

Sulfapyridine for Pneumococcal Pneumonia.—From July 1, 1938, until June 20, 1939, Long and Wood state that 139 adult patients were treated in the Johns Hopkins Hospital for presumptive pneumococcal pneumonia. Pneumococci, identi-

fied by specific antisera, were obtained from the sputums of 124 of these patients and pneumococci were identified in the sputum of five, but it was not possible to type the organisms and from ten patients pneumococci were not isolated at any time during the course of their illness. The fatality rate in the 139 cases was 7.2 per cent. This low death rate is attributed by the authors to the use of antipneumococcus serum, sulfapyridine and serum and sulfapyridine. Sulfapyridine is irregularly absorbed from the gastrointestinal tract of human beings. A relatively large fraction of the sulfapyridine absorbed may be conjugated to acetylsulfapyridine. The soluble sodium salt of sulfapyridine which may be given by the intravenous route is a valuable adjunct in the treatment of severe pneumococcal infections. If relapses of pneumonia are to be avoided, sulfapyridine must be continued until convalescence is established. Renal calculi, composed of acetylsulfapyridine, may form in the urinary tracts of patients who are receiving sulfapyridine. The abandonment of type specific serum in the treatment of pneumonia is not indicated in the light of the authors' experience.

Annals of Otol., Rhinol. and Laryngology, St. Louis

48: 577-864 (Sept.) 1939

- Care of Mastoid Wounds Following Complete Mastoid Operation, Sinus Thrombosis and Operations on Petrous Pyramid. M. F. Jones, New York.—p. 579.
- Care of Mastoid Wounds Following Radical and Modified Radical Mastoid Operations. J. M. Smith, New York.—p. 585.
- Care of Mastoid Wounds Following Operations on Abscess of the Brain. H. G. Tobey, Boston.—p. 590.
- Note on Greater Disability for Hearing High Tones in Cases of Conduction Deafness. A. G. Pohlman, Los Angeles.—p. 596.
- Nasal Obstruction Caused by Collapse of Nasal Alas. H. I. Lillie and K. M. Simonton, Rochester, Minn.—p. 600.
- Eighth Nerve High Tone Deafness from Nutritional Standpoint: Further Contribution. G. Selfridge, San Francisco.—p. 608.
- Method of Closing Antro-Alveolar Fistulas. Rea E. Ashley, San Francisco.—p. 632.
- Management of Cicatricial Stenosis of Larynx. J. H. Foster, Houston, Texas.—p. 643.
- Benign Cysts of Antrum. G. Hardy, St. Louis.—p. 649.
- *Hearing Acuity and Stammering. M. Arline Harms and J. Y. Malone, Milwaukee.—p. 658.
- Latent Period of Crossed Stapedius Reflex in Man. H. B. Perlman and T. J. Case, Chicago.—p. 663.
- Syphilis of Ear: Histopathologic Study. V. Goodhill, Los Angeles.—p. 676.
- Some Phases of Tuberculosis of Larynx. M. C. Myerson, New York.—p. 707.
- Pyogenic Mediastinal Infections: Their Significance of Otorhinolaryngologist. A. Ochsner and M. DeBakey, New Orleans.—p. 747.
- Sinusitis: Present Rationale of Treatment. C. T. Porter, Boston.—p. 769.

Hearing Acuity and Stammering.—Harms and Malone point out that speech defects in pupils of elementary grades have been estimated by different investigators to be from 4 to 18 per cent, which percentage would mean that at least a million children have defective speech. Thus they outnumber the crippled, blind and deaf combined. It is estimated that 10 per cent of those with defective speech are stammerers. Speech is a social habit developed through imitation. This involves not only the mental motor mechanism but also the proper receiving mechanism. Therefore defective hearing is a legitimate cause for defective speech, especially if this defective hearing occurs during the ages when speech habits are being formed. As stammering is a type of speech defect, whatever principles apply to speech correction apply to stammering correction. In addition, the stammerer has some individual problems. The literature reveals no investigations to relate hearing acuity to stammering, although there is frequent reference made to the relation of the hearing acuity and certain types of speech defects. The greatest toll in hearing loss is taken by childhood diseases which occur during the first seven to eight years of life. The greatest good can be accomplished during these years. It is the authors' opinion that the hearing acuity of all school children should be tested by the end of their first year at school and that these tests are just as important as visual acuity tests. This testing should be done with audiometers, as investigators have found that examinations carried out by parents, school teachers and nurses miss the majority of these hard-of-hearing children. A national survey of all the schools for the deaf and hard of hearing have shown the authors that stammering is rare in those with a total loss of hearing. It becomes more frequent in those

with approximately 50 per cent loss of hearing. In sixty-two consecutive cases of stammerers who were unaware of any hearing loss there was a loss of from 10 to 22 per cent, which strongly suggests a relation between hearing loss and the development of stammering. Cases are cited of former normal hearing and speech in which subsequent disease resulted in poor hearing and was followed by stammering. Also a case is presented showing stammering on words falling within the island defect of hearing acuity. Hearing aids should be used for speech correction in these cases if the hearing cannot be improved to a useful level.

Archives of Neurology and Psychiatry, Chicago

42: 595-788 (Oct.) 1939

- Pathologic Laughing and Crying. C. Davison and H. Kelman, New York.—p. 595.
 Treatment of Schizophrenia with Glandular Extracts. S. Fischer, San Francisco.—p. 644.
 *Capillary Structure in Patients with Schizophrenia. D. M. Olkon, Chicago.—p. 652.
 Lesions of Fundus Associated with Brain Hemorrhage. L. L. Tureen, St. Louis.—p. 664.
 Cerebral Changes in Fatal Cases Following Treatment with Barbitol, Soluble Barbitol U. S. P., Insulin and Metrazol. G. B. Hassin, Chicago.—p. 679.
 Histopathologic Changes in Brain Following Experimental Injections of Metrazol. E. Liebert and A. Weil, Chicago.—p. 690.
 *Mode of Action of Brilliant Vital Red in Epilepsy. R. B. Aird, San Francisco.—p. 700.
 Skin and Body Temperatures of Schizophrenic and Normal Subjects Under Varying Environmental Conditions. H. Freeman, Worcester, Mass.—p. 724.
 Central Visual System: Evidence Against Bilateral Representation Through Splenium of Corpus Callosum. O. R. Hyndman, Iowa City.—p. 735.

Capillary Structure in Schizophrenia.—The character of the cutaneous capillary structure of 1,100 schizophrenic persons was studied by Olkon and compared with that of normal persons. In cases of schizophrenia the cutaneous capillaries showed striking deviations, consisting of reduction in number, few comma shapes, a paler color, lack of uniformity in size and a variety of bizarre shapes—spiral, crescent, hairpin-like and stellate forms and dilated, amoeboid forms with pseudopodia. Moreover, the flow through the capillaries was seldom uniform; at times it was more rapid and at times slower than normal; at other times the contractions and dilatations were remarkably irregular. Another striking feature was the frequent occurrence of capillary hemorrhage among excited schizophrenic patients. In cases of hebephrenia of long standing, sparseness of capillaries was the most marked feature aside from the bizarre shapes already mentioned. Schizophrenic patients showed these changes, whereas normal persons of similar age did not. From the observations it is clear that in organic and vegetative derangements there are definite disturbances in the capillaries which may be corroborative evidence for the increasingly accepted theory that schizophrenia is a vegetative and metabolic disorder.

Brilliant Vital Red in Epilepsy.—Aird states that of six patients suffering from severe and varied forms of epilepsy, chosen because they had failed to respond to any accepted type of treatment, five, after intravenous injection of brilliant vital red, showed from slight to marked improvement in the frequency of the attacks, and the attacks of all six were reduced in duration and severity. The improvement lasted from four to seven months. Thus, as in the experimental work, the observations of Cobb and his co-workers were confirmed, an abstract of whose article appears in *THE JOURNAL*, Feb. 4, 1939, page 472. The author's conclusions are that the endothelium concerned with the formation of cerebrospinal fluid forms an effective protective barrier to the central nervous system. In animals with experimental epilepsy, brilliant vital red renders this "barrier" relatively impermeable to the passage of cocaine hydrochloride. The same effect presumably holds for the other convulsive agents (picrotoxin, strychnine, camphor and triphenylphosphite) tested in connection with brilliant vital red. As brilliant vital red affords protection in cases of human epilepsy, this fact affords strong evidence in support of the hypothesis that "convulsive toxins" and the endothelium of the hemato-encephalic barrier are factors of etiologic importance in human epilepsy and that the relation between them is analogous to that demonstrated in experimental epilepsy.

Archives of Ophthalmology, Chicago

22: 533-726 (Oct.) 1939

- The Problem of Etiology of Trachoma: I. Rickettsia. A. de Róth, Chicago.—p. 533.
 Meningioma Producing Unilateral Exophthalmos: Syndrome of Tumor of Pterional Plaque Arising from Outer Third of Sphenoid Ridge. J. W. Smith, New York.—p. 540.
 Suśruta and His Ophthalmic Operations. N. K. Bidyādhār, Sonpur State, Sonpur Raj, India.—p. 550.
 Adrenal Neuroblastoma, with Particular Reference to Metastasis to Orbit: Report of Case and Notes on Two Other Cases. W. C. Clark, Ann Arbor, Mich.—p. 575.
 *Experience with Sulfanilamide in Treatment of Gonorrheal Ophthalmia. F. A. Barbour and H. A. Towsley, Ann Arbor, Mich.—p. 581.
 Ocular Ichthyosis: Report of Case. F. C. Cordes and M. J. Hogan, San Francisco.—p. 590.
 *Dark Adaptation, Night Blindness and Glaucoma. J. B. Feldman, Philadelphia.—p. 595.
 Clinical Study of Transillumination of Eyelids. E. H. Wood, Auburn, N. Y.—p. 608.
 Induced Size Effect: III. Study of Phenomenon as Influenced by Horizontal Disparity of Fusion Contours. K. N. Ogle, Hanover, N. H.—p. 613.
 Attachment to the Ferree-Rand Perimeter for Determining Light and Color Minimums. C. E. Ferree and G. Rand, Baltimore.—p. 636.
 Study of Transillumination of the Eye. E. H. Wood, Auburn, N. Y.—p. 653.

Sulfanilamide for Gonorrheal Ophthalmia.—Barbour and Towsley compare the results obtained in fifteen cases of gonorrheal ophthalmia treated with sulfanilamide with those obtained among fifteen similar patients treated before the drug was used at the University Hospital. In only one of the fifteen cases in which sulfanilamide was used did corneal ulcers develop after treatment with it was started. These remained superficial and healed rapidly with only tiny residual nebulas. Since of the fifty-five cases summarized from the literature there were none in which significant visual loss occurred after the administration of sulfanilamide was started, this makes a total of seventy cases in which serious corneal complications did not occur. Corneal ulcers developed in five of the fifteen cases in the control group after treatment was started. In two of these control cases (both in infants) useful vision was lost in both eyes. Since each corneal ulcer indicates a potentially blind eye, the decreased incidence of this complication with sulfanilamide therapy is an important economic and sociologic factor. The clinical improvement noted after the administration of sulfanilamide was started was frequently dramatic in its rapidity. No recurrence of discharge was noted in the group of cases in which sulfanilamide was used. Of the fifty-five cases reviewed, inconsequential recurrence of discharge occurred in only one of those in which treatment was adequate. In two cases the drug was temporarily discontinued in one because of toxicity, causing a hemolytic anemia (Willis); in both there was a moderately severe recurrence of discharge. The hemolytic anemia readily responded to transfusion, and the drug was again given with satisfactory results. Smears once negative remained negative in the authors' series and in those which they review from the literature. In no case in either group was there a persistent positive smear after the discharge had ceased. In one of the control cases positive smears were obtained fifteen days after the discharge had ceased. Mayou pointed out that virulent gonococci have been found twenty-eight days after all discharge had stopped. This point is significant from the standpoint of cross infection and reinfection. The average duration of the disease in the control group after treatment was begun was almost four times as long as in the group in which sulfanilamide was used. It took approximately four times as long for the discharge to become minimal in the control group. This means a substantial saving in the cost of hospitalization.

Dark Adaptation, Night Blindness and Glaucoma.—Feldman attempted to determine the causes, if any, of idiopathic night blindness, i. e. night blindness without any known accountable constitutional disease, and what relation, if any, there is between pathologic dark adaptation and night blindness. As glaucoma in the majority of cases is associated with pathologic dark adaptation, an attempt was made to correlate the frequency of night blindness in this condition. The study calls attention to the presence, but the none too frequent association, of night blindness in patients suffering with renal calculi and glandular and hepatic diseases. Night blindness is, however, frequently encountered in association with dietary indiscretions in which there is a definite lack of vitamin A in the food. In these cases the cure is effected in a reasonable period. However, even in

these cases the treatment may sometimes have to be prolonged before night blindness is overcome. Night blindness does not bear any relation to the intensity of pathologic dark adaptation. Thus, for example, many patients with hepatic disease whose dark adaptation curve almost approaches that of persons with pigmented retinitis do not necessarily have night blindness. It is important to determine whether the supposed night blindness from which a person suffers is not presbyopia instead. A high cholesterol content of the blood was observed in eight of the fourteen cases of glaucoma studied. Only with the examination of a large number of persons with beginning uncomplicated glaucoma who have not been operated on can it be determined whether or not defective sterol metabolism plays any part in the cause or the effect of the disease. It is possible that pathologic dark adaptation may be found of value as an indication in evaluating a phase of faulty metabolism of the liver.

Illinois Medical Journal, Chicago

76: 201-300 (Sept.) 1939

- Acute Appendicitis with Perforative Peritonitis. K. A. Meyer, P. A. Rosi, A. Lueck and M. Todd, Chicago.—p. 221.
Tuberculous Enterocolitis: Diagnostic Data. L. L. Hardt, M. Weissman, C. E. Cook and C. L. Martin, Chicago.—p. 229.
Plastic and Reconstructive Surgery About the Face and Head—Then and Now. J. C. Beck, Chicago.—p. 237.
Traumatic Psychoses. H. H. Goldstein, Chicago.—p. 242.
Psychotic Reaction Following Trauma. D. L. Steinberg, Elgin.—p. 246.
*Schizophrenic-like Psychosis Following Head Injuries. L. B. Shapiro, Elgin.—p. 250.
Acute Suppurative Otitis Media and Mastoiditis. M. A. Glatt, Chicago.—p. 254.
Clinical Roentgenographic Aspects of Petrositis. S. M. Morwitz, Chicago.—p. 258.
Interdependence of a Public Child Health Program to the Practice of Obstetrics and Pediatrics. Elizabeth B. Ball, Springfield.—p. 265.
Pregnancy in Double Uterus. M. P. Rogers and B. H. Bloksom, Jr., Rockford.—p. 270.
Psychoses in Children. E. I. Falstein, Chicago.—p. 271.
Carcinoma of Rectosigmoid in Patient 26 Years of Age; Six Year Cure Following Abdominal Resection. G. V. Pontius and E. L. Strohl, Chicago.—p. 281.
Effects of Smoking. J. R. Head, Chicago.—p. 283.
Some Effects of Injection of Pitressin in Dementia Praecox. I. Finkelman, Chicago, and A. Simon, Elgin.—p. 287.
Endemic Typhus Fever. S. J. Lang and P. K. Boyer, Evanston.—p. 288.
Practical Significance of Gross Rectal Bleeding. M. Diamond, Chicago.—p. 290.

Schizophrenoid Psychosis Following Head Injuries.—Shapiro found that of 2,000 cases of dementia praecox twenty-one showed a relationship between trauma and the onset of psychotic symptoms. In ten cases there was no evidence of brain injury, but the mental symptoms developed in such a close time relationship to a severe head trauma that the sequence of events cannot be disregarded. The patients were all of introverted personalities and had marked hereditary tainting, so that the possibility of schizophrenic-like reaction was present. As a result of the injury, this latent tendency became overt and the psychosis which followed the trauma was that of a so-called schizophrenia. The author concludes that in this group the trauma acted simply as a precipitating factor. In the other eleven cases evidence of brain damage was present. Confusion, dizziness, defects in memory and orientation, as well as persistent headaches with irritability do not belong commonly in a schizophrenic-like picture. Furthermore, in seven of these cases the prepsychotic personality was well integrated and hereditary tainting was present in only two. The neurologic changes, the mixture of organic-like mental symptoms and the absence of any predisposing factors in the history suggest that in these cases the trauma did more than precipitate a psychotic reaction. In producing pathologic changes in the brain, the injury would seem to have contributed to the formation of the clinical picture. Although postmortem studies are as yet not available in this group, the development of a parkinsonian-like syndrome in one case and evidence of hemiplegia and convulsions in another suggests localized cerebral damage. In evaluating the part that trauma plays in the schizophrenic-like picture, the personality as a whole should be considered. In all cases of so-called schizophrenia one should consider whether the psychosis is not attributable to some definite etiologic factor, such as trauma, infection or tumor. The need is in the exact evaluation of all mental symptoms, so that these patients (trauma) may be differentiated from the so-called schizophrenia in which no traceable etiologic factor occurs.

Journal of Allergy, St. Louis

10: 513-642 (Sept.) 1939

- Electrophoretic Separation of Antibody from Human Allergic Serum. J. M. Newell, A. Sterling, M. F. Oxman, S. S. Burden and Laura E. Krejci, Philadelphia.—p. 513.
Assay of Ragweed Pollen Extracts. C. E. Arbesman, Baltimore, and H. Eagle, Washington, D. C.—p. 521.
Immunologic Relationship of Giant, Western, Common Ragweed and Marsh Elder (*Iva ciliata*). H. E. Prince and P. G. Secrest Jr., Houston, Texas.—p. 537.
Highly Concentrated Pollen Extracts and Their Deterioration in Various Media. C. J. Sullivan, St. Louis, and W. T. Vaughan, Richmond, Va.—p. 551.
*Further Observations on Nature of House Dust Antigen. M. B. Cohen, S. Cohen and K. Hawver, Cleveland.—p. 561.
Local Hemorrhagic-Necrotic Skin Reactions in Man (Schwartzman Phenomenon). J. Harkavy and A. Romanoff, New York.—p. 566.
Oral Ragweed Pollen Therapy. M. Zeller, Chicago.—p. 579.
Epinephrine in Oil: Its Effect in Symptomatic Treatment of Hay Fever. E. L. Keeney, Baltimore.—p. 590.
Prophylaxis and Treatment of Poison Ivy Dermatitis with an Extract of Rhus Toxicodendron. L. Zisserman and L. Birch, Philadelphia.—p. 596.

House Dust Antigen.—The Cohens and Hawver find that a dialyzed extract from a suitable sample of linters will give nonspecific reactions in normal and in allergic individuals when judged by the results of passive transfer experiments as well as by direct endermal tests. However, a one plus or larger endermal reaction with a 1:50 dilution of such an extract will be present in more than 90 per cent of individuals clinically sensitive to dust, and consistently negative controls are obtained in normal persons and in allergic persons not sensitive to dust. Guinea pigs can be sensitized and shocked with this linters extract. The active principle in this extract cannot be cottonseed or any of the contaminants ordinarily present in house dust extracts prepared from dust obtained from vacuum cleaners.

Journal of Aviation Medicine, St. Paul

10: 113-158 (Sept.) 1939

- An Instrument for Testing Pilot Fitness. C. E. Ferree and G. Rand, Baltimore.—p. 114.
Personality Reactions in a Group of Military Airplane Pilots, with Special Reference to Behavior to Alcohol. P. G. Hamlin, Cambridge, Md.—p. 129.

Journal of Experimental Medicine, New York

70: 333-442 (Oct.) 1939. Partial Index

- Reticulo-Endothelial System and Hormone Refractoriness. A. S. Gordon, W. Kleinberg and H. A. Charipper, New York.—p. 333.
Virulence of Group C Hemolytic Streptococci of Animal Origin. C. V. Seastone, Princeton, N. J.—p. 361.
Estimation of Purity of Preparations of Elementary Bodies of Vaccinia. J. E. Smadel, T. M. Rivers and E. G. Pickels, New York.—p. 379.
Specificity of Keratin Derivatives. L. Pillemer, E. E. Ecker and E. W. Martensen, Cleveland.—p. 387.
Experiments on Histamine as Chemical Mediator for Cutaneous Pain. S. R. Rosenthal and D. Minard, Chicago.—p. 415.

Journal Industrial Hygiene & Toxicology, Baltimore

21: 231-320 (Sept.) 1939

- Dupuytren's Contraction as Occupational Disease. L. Teleky, Vienna, Germany.—p. 233.
Acute and Subacute Toxicity of Morpholine. T. E. Shea Jr., Philadelphia.—p. 236.
Coding of Occupations for Machine Tabulating Purposes with Reference Principally to Studies on Occupational Morbidity. H. E. Seifert, Washington, D. C.—p. 246.
Vapor Pressure Method for Estimation of Volatile Solvents. C. E. Couchman and W. H. Schulze, Baltimore.—p. 256.
Vapor Pressure Method for Determination of Concentration of Some Organic Solvents in Air. K. Kay, G. M. Reece and P. Drinker, Boston.—p. 264.
New Vapor Pressure Instrument for Determining Organic Solvents in Air. L. Silverman, G. M. Reece and P. Drinker, Boston.—p. 270.
*Survey in Seventeen Cement Plants of Atmospheric Dusts and Their Effects on Lungs of 2,200 Employees. L. U. Gardner, T. M. Durkan, D. M. Brumfiel and H. L. Sampson, Saranac Lake, N. Y.—p. 279.

Effects on Lungs of Cement Dusts.—Gardner and his associates made an engineering survey of environmental conditions in a representative group of cement plants in various sections of the United States. The purpose of the survey was to determine the quantity and nature of the dust in the air and its effect on the lungs of the employees. Technical obstacles prevented exact determination of the proportion of atmospheric silica present in the air in the earlier phases of manufacturing; nevertheless much of the silica was too coarse to create danger. Modern preventive measures as well as intermittent exposures

in some of the departments likewise decreased exposure. Finished cement dust was found present in relatively high concentrations in the finishing mills and packing departments but this dust was practically devoid of free silica. Complete physical and x-ray examinations were made on 2,278 employees of eleven plants, 1,979 of whom worked in departments where they were exposed to dust of various kinds. The majority were white American men of slightly greater age distribution than in most industries. More than 55 per cent of the exposed employees had worked in the cement industry for more than ten years and 32 per cent for more than fifteen. Eighteen employees had worked for more than forty-five years. Since so many of them worked in several departments, an exact correlation between exposure to the dusts of different compositions and the pulmonary conditions was not possible. Analysis disclosed that prolonged inhalation of finished cement dust produced such slight anatomic reactions that practically no abnormality was seen in the roentgenograms. The mixed dusts of the raw mills were probably responsible for a limited number of well marked linear exaggerations, nondisabling in character. Only eight of the examined employees showed evidence of nodular fibrosis attributable to dust. In six of these cases exposure to silica dust in previous employment was probably responsible, while the other two were exposed to sandstone dust in special operations not typical of raw mill atmosphere. The occurrence of tuberculosis and chronic infections of the lungs was found to be less frequent than among the general population. The manifestations of tuberculosis occurred in typical form and at the same age periods as in persons not exposed to dust by occupation. It was concluded therefore that prolonged inhalation of cement dust has no unfavorable influence on susceptibility to tuberculous infection or its subsequent evolution.

Journal-Lancet, Minneapolis

59: 367-418 (Sept.) 1939

- Report of Committee on Organization and Administration, American Student Health Association. Helen B. Pryor, Palo Alto, Calif.—p. 377.
- Hyperimmune Human Serum in Prophylaxis and Treatment of Pertussis. P. F. Dwan and E. S. Platou, Minneapolis.—p. 379.
- Further Observations on Allergy to Smuts. F. W. Wittich, Minneapolis.—p. 382.
- Infectious Equine Encephalomyelitis. C. E. Cotton, St. Paul.—p. 388.
- *Comparative Energy Expenditures and Time Required for Digestion of Homogenized or Puréed Vegetables in Human Stomach. J. A. Killian and C. Oclassen, New York.—p. 395.
- Adsorptive Power of Animal Charcoal for Toxic Principle of Tuberculin: Preliminary Report. H. P. Snyder, Baltimore.—p. 400.
- Influence of Prolonged Administration of High Dosages of Vitamin D on Serum Calcium of Adults. R. T. Farley, Chicago.—p. 401.

Digestion Time of Homogenized or Puréed Vegetables.

—Killian and Oclassen determined the advantages and limitations of homogenized fruit and vegetables as supplements to the smooth or bland diet for the treatment of patients with functional disturbances of the gastrointestinal tract. The comparative energy expenditures and the times required for digestion of homogenized and of puréed vegetables in the stomachs of average normal adults and of ambulatory patients with chronic peptic ulcers were studied. According to McLester, these patients require adequate nutrition but at the same time rest, both motor and secretory, for the stomach. Observations are reported on three average normal adults and eight adults with histories of chronic peptic ulcers, confirmed by x-ray examinations before the rates of the digestion of vegetables were determined. In four comparative tests made on the three normal subjects, the average emptying time of the stomach after meals of homogenized vegetables was 43 per cent less than the average emptying time of the stomach after meals of strained vegetables. The average energy expense for gastric digestion of homogenized vegetables, determined in four experiments, was 10 per cent of the fuel value of the vegetables and for digestion of the strained vegetables it was 30 per cent of their fuel values. Gastric evacuation times for homogenized vegetables were less than those for strained or puréed vegetables in six of the eight cases of chronic peptic ulcer. The greatest differences in gastric emptying times for the two forms of vegetables were observed in cases showing pyloric stenosis or retarded gastric motility. The average gastric evacuation time for 300 Gm. of homogenized vegetables was three and a half hours and for 300 Gm. of puréed vegetables it was more than five hours.

Journal of Nutrition, Philadelphia

18: 217-318 (Sept.) 1939. Partial Index

- Calcium Content of White Bread. W. W. Prouty and W. H. Cathart, Chicago.—p. 217.
- Oxalic Acid in Foods and Its Behavior and Fate in the Diet. E. F. Kohman, Camden, N. J.—p. 233.
- Distribution of Chick Antidermatitis Factor (Pantothenic Acid) in Meats and Meat Products. H. A. Waisman, O. Mickelsen and C. A. Elvehjem, Madison, Wis.—p. 247.
- Approximation of Calculated to Determined Calcium Content of Human Diets. A. B. Gutman and Margaret Low, New York.—p. 257.
- Rat Growth Factors of Filtrate Fraction of Liver Extracts. G. H. Hitehings and Y. Subbarow, Boston.—p. 265.
- *Effect of Phosphorus on Biologic Estimation of Vitamin D Activity. B. O'Brien and K. Morgareidge, Rochester, N. Y.—p. 277.
- Food of Present Day Navajo Indians of New Mexico and Arizona. T. M. Carpenter and M. Steggerda.—p. 297.

Phosphorus and Vitamin D Activity.—O'Brien and Morgareidge observed, under conditions commonly employed for the biologic estimations of vitamin D, that phosphorus added to the vitamin supplement greatly enhances its apparent potency. The equivalent healing is found to be proportional to the product of the vitamin by the phosphorus fed to the rat. For example, 4 mg. of phosphorus daily for eight days (as sodium glycerophosphate) enhances the potency of crystalline vitamin D₂ by 3.4 times. Phosphorus containing compounds do not all possess the same enhancement factor. The significance of this relationship in the estimation of the antirachitic potency of phosphorus containing foods (such as milk) is pointed out.

Medicine, Baltimore

18: 221-430 (Sept.) 1939

- *Pyelonephritis: Its Relation to Vascular Lesions and to Arterial Hypertension. S. Weiss and F. Parker Jr., Boston.—p. 221.
- Diffuse Arteriolar Disease with Hypertension and Associated Retinal Lesions. H. P. Wagener and N. M. Keith, Rochester, Minn.—p. 317.

Pyelonephritis.—Weiss and Parker summarize the clinical and morphologic features of 100 cases of pyelonephritis in various stages of the disease and report on certain heretofore not well recognized aspects of the disease. Focal pyelonephritis of no clinical significance was not studied. Pyelitis practically never exists unaccompanied by pyelonephritis. Clinically a distinct classification of pyelonephritis as acute, chronic (active), healed or healed and recurrent is often difficult. The structural characteristics of pyelonephritis are essentially the same regardless of the type of infection. In all types (hematogenous, urogenous or lymphatic) marked changes occur in the renal lymphatic system as well as in the nephrons. In chronic and healed pyelonephritis the main morphologic characteristics consist of inflammatory reaction of the interstitial tissues; colloid casts in the tubules, which are lined with atrophic epithelium; periglomerular fibrosis, and evidence of infection or inflammation within the tubules. Pyelonephritis, particularly in the chronic and the healed stages, is often associated with arterial hypertension. The hypertension of pyelonephritis is often severe and is frequently accompanied by nervous symptoms, cerebral encephalopathy, neuroretinitis and high cerebrospinal pressure, and toxemia in pregnancy. The syndrome of left ventricular failure with attacks of cardiac asthma was observed frequently. The hypertension of pyelonephritis can be independent of the activity of renal infection. It often advances when the disease is in the healed stage. Vascular changes occur frequently in pyelonephritis, particularly during the chronic and the healed stages. A relation was found between the severity and diffuseness of the vascular lesions and arterial hypertension. Cases of severe hypertension showed advanced hyperplastic arteriosclerosis, a certain type of productive endarteritis and necrotizing arteriolitis. The correlation between vascular changes and hypertension was close. Vascular changes and hypertension did not occur in the group of cases of renal tuberculosis and hydronephrosis uncomplicated by pyelonephritis. It appears that the inflammatory renal process and the intravascular pressure are responsible for the arterial lesions. In unilateral pyelonephritis, particularly without severe hypertension, the vascular lesions are confined to the affected side. Unilateral pyelonephritis with advanced vascular changes may or may not be associated with hypertension. It is estimated that pyelonephritis is responsible for at least 15 to 20 per cent of malignant hypertension. The vascular lesions in chronic pyelonephritis are restricted mainly

to the kidneys, in contrast to those in "primary" malignant hypertension, which are generalized. Polycystic kidneys, hydro-nephrosis and renal tuberculosis were often complicated by pyelonephritis. Glomerulonephritis and pyelonephritis seldom coexisted. Altered glomerulitis was found in cases with terminal uremia. Pyelonephritis in the chronic and the healed stages should be considered as one type of Bright's disease. The vascular and the renal functional damage are related to the same cause but they may be independent of each other. Chronic and healed pyelonephritis occurs more frequently than chronic glomerulonephritis. Pyelonephritis is one renal disease which can be treated effectively in its incipient stage.

New England Journal of Medicine, Boston
221: 445-480 (Sept. 21) 1939
Early Recurrence of Sulfapyridine-Treated Type I Pneumococcus Pneumonia. M. Hamburger Jr. and J. M. Rueggesser, Cincinnati.—p. 445.
Role of Personality in Certain Hypertensive States. T. A. C. Rennie, Baltimore.—p. 448.
Need for Cooperation Between Genito-Urinary and Orthopedic Surgeons. C. J. E. Kieckhefer, Boston.—p. 456.
Pharmacology. G. P. Grabfield, Boston.—p. 464.

Recurrence of Sulfapyridine-Treated Type I Pneumonia.—Hamburger and Rueggesser report the recurrence of type I pneumonia two weeks after apparent recovery following treatment with sulfapyridine. The authors point out that this recurrence is the more unusual as it is the only one to have occurred in the Cincinnati General Hospital in the last three years. During that time more than 1,200 cases of typed pneumococcal pneumonia have been observed. In the case presented the strain of pneumococcus was manifestly sensitive to the action of sulfapyridine, but the defensive forces of the body were presumably not able to bring about the death of all the pneumococci present. The authors have no data that would help to decide whether the organisms remained in the lung, the throat or elsewhere, nor can a new extrinsic infection be absolutely ruled out. However, convalescence took place in a ward in which there had been no other type I patients and in which the patient himself had not been present during his first attack. Data also are lacking concerning the mechanism of recovery from the first attack of pneumonia, but no agglutinins could be demonstrated in the patient's serum after recovery from the second attack. Empyema followed recovery from the second attack, but sulfapyridine was unable to sterilize the pleural cavity even when the exudate was relatively thin. X-ray and physical examinations indicate that little if any of the same pulmonary tissue was involved in both attacks. Further data on sulfapyridine-treated patients is necessary to determine whether the incidence of recurrences of pneumonia by the homologous type pneumococcus is greater in these than in serum-treated patients or in those who recover spontaneously.

221: 481-514 (Sept. 28) 1939
Indications for Surgical Ligation of Patent Ductus Arteriosus. J. P. Hubbard, P. W. Emerson and H. Green, Boston.—p. 481.
Surgical Aspects of Obstructive Jaundice. R. Zollinger and A. Y. Kevorkian, Boston.—p. 486.
Treatment of Alcoholism. M. Moore, Boston.—p. 489.
Treatment of Fractures. G. W. Van Gorder, Boston.—p. 494.

Indications for Ligation of Patent Ductus Arteriosus.—Hubbard and his associates show that in evaluating the indications for the surgical treatment of ductus arteriosus many questions arise concerning the prognosis and the complications of this cardiac malformation. The two complications of greatest importance are subacute bacterial endarteritis and congestive failure. The authors conclude that any patient with a diagnosis of patent ductus arteriosus should be carefully studied to determine whether or not there is an arteriovenous shunt large enough to impair the normal cardiac function and the peripheral circulation. The evidence to be looked for is a delay in the growth and development of the child, symptoms of cardiac insufficiency and, more specifically, the signs of free aortic regurgitation, congestion or pulsation of the pulmonary vessels at the hilus of the lung as seen by x-ray examination. Once these symptoms have been established, surgical intervention should be considered in the hope of abolishing the excessive load on the heart, restoring normal circulation, allowing normal growth and eliminating the danger of heart failure. With regard to the possibility of preventing subacute bacterial endarteritis, the situation is uncer-

tain. It will be necessary to observe the successfully treated cases for years before it can be said with conviction that this danger has been removed. If a ligated ductus does remain free of vegetations and if the surgical risk remains as low as now seems possible, it would then, and only then, appear permissible to operate with the expectation of preventing this fatal complication. The optimal age would seem to be in childhood before the second decade, when the incidence of subacute bacterial endarteritis increases, and after the period of infancy. In infancy there is little or no chance of developing this complication and, furthermore, the diagnosis is usually difficult. Two of the cardinal signs of a patent ductus arteriosus, the thrill and characteristic loud continuous murmur, are apt not to be found. In any event a great deal will depend on the surgeon's ability to maintain a low operative risk. The authors think that, until more is known of the operative mortality and the future of the cases already treated, surgical intervention should not be recommended for all patients with a patent ductus arteriosus but should be limited to those showing evidence of circulatory embarrassment.

Public Health Reports, Washington, D. C.
54: 1709-1746 (Sept. 22) 1939
Procedure for Putting Health Department Reports to Work. M. Derryberry and J. O. Dean.—p. 1709.
Experimental Transmission of Poliomyelitis to Eastern Cotton Rat, Sigmodon Hispidus Hispidus. C. Armstrong.—p. 1719.
Relapsing Fever: Guinea Pig as Experimental Animal in Study of Ornithodoros Turicata, Parkeri and Hermsi Strains of Spirochetes. G. E. Davis.—p. 1721.
Efficiency of Condensation Method of Sampling Certain Vapors. F. H. Goldman and J. M. DallaValle.—p. 1728.

54: 1747-1806 (Sept. 29) 1939
Treatment of Lymphopathia Venereum with Sodium Sulfanilyl Sulfanilate and Sodium Sulfanilate. A. Hebb, S. G. Sullivan and L. D. Felton.—p. 1750.
Protection of Mice Against Haemophilus Influenzae (Non-Type Specific) with Sulfapyridine. Margaret Pittman.—p. 1769.
Possible Relation of Calcium Deficiency to Utilization of Vitamin B₁: Preliminary Report. L. F. Badger and E. Masunaga.—p. 1775.

Sulfanilate for Venereal Lymphogranuloma.—Of fourteen patients with venereal lymphogranuloma in the tertiary stage (diagnosed by a positive Frei test) Hebb and his associates treated eight with sodium sulfanilyl sulfanilate; for two this compound was followed by sodium sulfanilate, and for four with sodium sulfanilate alone. In addition, sodium sulfanilyl sulfanilate was given in four cases of chronic ulcerative colitis. These patients were so treated because of the possibility of this disease being caused by a virus and also as all four failed to respond to usual medication. In the eight cases of venereal lymphogranuloma in which sodium sulfanilyl sulfanilate was administered the average duration of treatment varied from six to thirty-five weeks. Despite this prolonged medication the blood picture was, if anything, improved, particularly in hemoglobin content. The leukocyte count varied somewhat, but there was no indication of bone marrow destruction. Successive treatment of the two cases, first with sodium sulfanilyl sulfanilate and then with sodium sulfanilate because of lack of tolerance of the former drug, resulted in an alteration in the blood picture in one case: the leukocytes were reduced from 5,500 to a low count of 3,650, 56 per cent of which were polymorphonuclears. There is no indication of abnormal cells at present. Two of the four patients given sodium sulfanilate were cured, treatment being continued for twelve and fourteen weeks, respectively. Treatment in all the fourteen cases was followed by general improvement in health, increased appetite, increase in weight and the absorption of strictural tissue. The mechanism of cure and general improvement in health is purely speculative and yet it may be assumed that both drugs cause destruction of the virus and that absorption of strictural tissue with return to normal intestinal function follows the destruction of the infective agent. The four cases of ulcerative colitis apparently responded to sodium sulfanilyl sulfanilate, suggesting the possibility that this disease may be caused by a virus. A larger series of patients so treated must be studied before its general use can be advocated. The intravenous route of injection has been used throughout in these reported cases. However, three other patients have been given sodium sulfanilate orally; 12 Gm. a day was given in four divided doses every four hours. Results

in these cases would indicate that oral administration would be at least as effective as intravenous injection, and perhaps the method of choice. The reactions obtained from intravenous or oral administration were similar to those with sulfanilamide but not as severe. Whatever the route of medication, blood studies should be made at frequent intervals and, if signs of cell degeneration occur, the dose should be reduced or the drug discontinued until the blood picture becomes normal. Cure or great improvement appeared in all. This was indicated by cessation of the bloody purulent discharge, the disappearance of the fistulas or lymphoid nodules and absorption of the rectal stricture. Four of the cases, in which colostomy had previously been performed with no improvement, responded to treatment with closure and healing of the colostomy and the restoration of normal intestinal function.

Southern Surgeon, Atlanta, Ga.

S: 359-444 (Oct.) 1939

- Cancer of Stomach: Conclusions from Study of 200 Cases. E. L. Rippey, Nashville, Tenn.—p. 359.
Emotional Disturbances with Pelvic Symptoms. W. O. Johnson, Louisville, Ky.—p. 373.
Management of Hyperthyroid Patient. L. Noland and W. N. Payne, Birmingham, Ala.—p. 384.
Spinal Cord Tumors: Report of Two Cases. E. Walker, Atlanta, Ga.—p. 388.
Urologic Surgery in Infants. M. F. Campbell, New York.—p. 394.
Mortality of Appendicitis: A National Disgrace. M. R. Reid, Cincinnati.—p. 404.
Treatment of Adynamic Ileus by Gastrointestinal Intubation. G. C. Penberthy, C. G. Johnson and R. J. Noer, Detroit.—p. 416.
Transsection of Deep Association Fibers of Prefrontal Lobes in Certain Mental Disorders. J. G. Lyerly, Jacksonville, Fla.—p. 426.

Surgery, Gynecology and Obstetrics, Chicago

69: 417-576 (Oct.) 1939

- Malignant Lesions of Thyroid Gland: Review of 774 Cases. J. deJ. Pemberton, Rochester, Minn.—p. 417.
*Acute Cholecystitis. F. Glenn, New York.—p. 431.
Cold Pressor Test in Pregnancy. L. C. Chesley and Elizabeth R. Chesley, Jersey City, N. J.—p. 436.
*Use of Silk in Thyroid Surgery. J. E. Dunphy and T. W. Botsford, Boston.—p. 441.
*Intraspinal Causes of Low Back and Sciatic Pain: Results in Sixty Consecutive Low Lumbar Laminectomies. F. K. Bradford and R. G. Spurling, Louisville, Ky.—p. 446.
Traumatic Enophthalmos. C. W. Rand and D. L. Reeves, Los Angeles.—p. 460.
Blood Supply of Mammary Gland. B. J. Anson and R. R. Wright, Chicago; surgical considerations by J. A. Wolfer, Chicago.—p. 468.
Acute Diverticulitis of Colon. A. M. Shipley and W. H. Gerwig Jr., Baltimore.—p. 474.
Evaluation of Neck Dissection in Carcinoma of Lip. G. W. Taylor and I. T. Nathanson, Boston.—p. 484.

Acute Cholecystitis.—Glenn reviews the histories of the 219 patients with acute cholecystitis who have been treated at the New York Hospital in the last six years. Early operation is not difficult, it was not attended by a greater incidence of complications nor was the mortality higher than that ordinarily reported for operative diseases of the gallbladder. The outcome of an inflammatory process in the gallbladder is unpredictable. Therefore delay in operating may lead to serious complications, which greatly increase the difficulty of operation and the attendant mortality. The younger the patient when subjected to operation, the better the chance of an uneventful recovery and good end result. On the basis of his observations the author recommends that disease of the biliary tract be treated surgically as soon as the diagnosis is made unless the general condition of the patient makes such treatment dangerous without preoperative therapy. If this policy is pursued, he believes that the mortality rate in surgery of acute cholecystitis will be diminished and, perhaps, the progress of certain systemic diseases, such as cardiovascular and hypertensive disease, may be retarded.

Use of Silk in Thyroid Surgery.—Dunphy and Botsford state that a study of the factors involved in the healing of more than 600 thyroidectomy wounds reveals that, when fine silk was used instead of catgut, the incidence of nonsuppurative wound complication was reduced from 40 to less than 15 per cent and the incidence of suppurative complications from 3.2 to 0.38 per cent. Suppurative complications were more frequent in the cases in which drainage of the wound was employed. There were no infections following thyroidectomy when fine silk was used and the wound closed primarily. No other factor produced so favorable an influence on wound healing as the use of fine

silk. Comparable results were not obtained with catgut even when a careful technic was followed. Postoperative discomfort (tenderness, swelling and induration of the wound) is minimized and consequently the period of morbidity is shortened when silk is used and also the hospital stay is about three days less. Patients are generally discharged from the hospital without a wound dressing when silk is used, and probings after discharge are seldom necessary.

Intraspinal Causes of Low Back and Sciatic Pain.—In sixty consecutive lumbar laminectomies performed for the relief of low back and sciatic pain, Bradford and Spurling found that the gross and microscopic observations fall into four groups: thirty-five cases of herniated nucleus pulposus, thirteen of hypertrophy of the ligamentum flavum, three of true neoplasms and nine negative surgical explorations. Disability was more apparent in the cases of herniated nucleus pulposus and hypertrophied ligamentum flavum than in the negative group. Pain throughout the distribution of the sciatic nerve, although at times secondary in severity to back pain, was present in 88 per cent of the cases of herniated nucleus pulposus and hypertrophied ligamentum flavum, while it was present in only 33 per cent of the negative explorations. Therefore it seems that low back pain indicates an intraspinal lesion only when accompanied by sciatic pain. In 60 per cent of the cases of herniated nucleus pulposus there was hypesthesia or anesthesia limited to the lateral aspect of the leg or foot or both. In contrast, the cases of hypertrophied ligamentum flavum and the negative group showed areas of hypesthesia elsewhere, but in only 15 per cent and 11 per cent, respectively, was hypesthesia limited to these areas. The immediate as well as the final result in twenty-six of the thirty-five cases of herniated nucleus pulposus was excellent. Improvement was slow in seven cases but with definite relief of the more severe pain which had occurred before operation. One patient died too soon after operation to judge whether or not there was any relief, and one patient, who was relieved completely of his pain, died on the twelfth postoperative day. The longest postoperative period through which a patient has been followed is eighteen months, the shortest six months. Therefore the eventual results may not be the same as they appear at present. In the hypertrophied ligamentum flavum group one patient died from meningitis following operation. Of the surviving twelve patients, eight recovered completely and four have slight residual pain but are much improved over their preoperative state. The longest postoperative period in this group is two and one-half years, the shortest six months. Two of the three patients with neoplasms recovered completely and have remained well. The third continues to have mild discomfort in the region of the sacrum, presumably owing to incomplete removal of the dermoid tumor. Four of the nine patients in whom the explorations were negative were relieved almost immediately by the operation and four more have improved slowly. Six of the nine patients are at present free from symptoms, two are moderately improved and in one case there has been no modification in the patient's severe back pain. The diagnosis of herniated nucleus pulposus or hypertrophied ligamentum flavum must be made clinically as well as roentgenologically to assure successful selection of cases for operation. The use of 2 cc. of iodized oil intraspinally is a safe procedure and the amount is adequate for diagnosis.

West Virginia Medical Journal, Charleston

35: 447-494 (Oct.) 1939

- European or American Medicine. N. B. Van Eetten, New York.—p. 447.
Failure of Peripheral Circulation. D. C. Ashton, Beckley.—p. 455.
Endocrine Treatment of Menopausal Symptoms. J. A. Hepp, Pittsburgh.—p. 457.
Intestinal Obstruction. H. H. Haynes, A. J. Weaver and J. F. Lembright, Clarksburg.—p. 459.
Postoperative Vomiting and Phenobarbital. J. D. Romino, Fairmont.—p. 461.
Monilia of External Ear Canal. R. F. Simms, Richmond, Va.—p. 462.
Treatment of Artificial Menopause. R. Kessel, Charleston.—p. 465.
Signs, Symptoms and Treatment of Neuritis: Report of Cases. I. J. Spear, Baltimore.—p. 469.
Cyclopropane Anesthesia. M. Baptista Garvey, Charleston.—p. 477.
Management of Congestive Heart Failure. A. S. Brady Jr., Charleston.—p. 479.
Testing System for Approving Syphilis Serology Laboratories. A. E. McClue, Charleston.—p. 482.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Mental Science, London

85: 859-1140 (Sept.) 1939. Partial Index

- Value of Mental Hospital Participation in Early Treatment. W. J. T. Kimber.—p. 871.
Some Practical Considerations in Relation to Inpatient and Outpatient Treatment in Psychoneuroses. J. Flind.—p. 886.
Mechanisms of Convulsive Phenomena, with Reference to Effects of Vaso-dilator Drugs. D. J. Watterson.—p. 904.
Short Review on Histology of Epilepsy. A. Meyer.—p. 927.
Electro-Encephalography in Study of Epilepsy. W. G. Walter.—p. 932.
Epileptics in the Community. J. T. Fox.—p. 940.
The Problem of the Epileptic in Industry. G. E. G. Pierce.—p. 953.
*Use of Sodium Diphenyl Hydantoinate. W. McCartan and J. Carson.—p. 965.
Report on Five Years' Use of Prominal as Routine Treatment for Epileptics. C. G. Millman.—p. 971.
Sodium Diphenyl Hydantoinate in Treatment of Epilepsy: Preliminary Observations in Severe Cases. I. Frost.—p. 976.
Sodium Diphenyl Hydantoinate (Dilantin) and Its Combination with Phenobarbital in Treatment of Epilepsy: Review and Preliminary Report. C. H. Pratt.—p. 986.
Schizophrenic Thinking in a Problem-Solving Situation. N. Cameron.—p. 1012.

Sodium Diphenyl Hydantoinate for Epilepsy.—McCartan and Carson report the use of sodium diphenyl hydantoinate for nineteen adults with the grand mal type of epilepsy and for one child with petit mal attacks. All but two of the nineteen showed considerable intellectual deterioration or were mentally defective. In fifteen cases of the major type a complete cessation of fits occurred; there was a decrease in the number of fits in two cases and a slight decrease in the other two. In the case of petit mal (confirmed by electro-encephalography) the fits were slight and lasted only a few seconds, consisting of conjugate deviation of the eyes and loss of touch with the surroundings. The patient was given 0.1 Gm. of the drug twice a day for one month, and there appeared to be some slight improvement; but he then complained of dizziness, and the treatment was stopped and a tonic given. His condition improved immediately, and, apart from his feeling much better now than for some time past, the fits have been much less frequent. These results are better than those given by Putnam and Merritt and may not be borne out over a longer period. The improvement in behavior is striking. Irritability and violent episodes are diminished in frequency and severity. The patients are bright and alert, and there is a subjective feeling of well-being. Even the more deteriorated patients have commented spontaneously on the change and have expressed their gratitude for the treatment. Indeed this is so definite that the drug possibly tends to elate slightly. The undeteriorated patients comment on their increased efficiency and particularly on the absence of drowsiness, which they experienced on bromide and phenobarbital treatment. Toxic symptoms occurred in eight patients and were similar to those described by Putnam and Merritt. In addition to the blood examination carried out before treatment was commenced, a comprehensive blood count has been done at about fortnightly intervals in every case. There is a slight progressive diminution in the erythrocyte count, accompanied by a proportionate fall in the packed cell volume, so that the mean corpuscular volume is unchanged and there is no tendency to macrocytosis. There is no significant change in the hemoglobin content. On the whole there is a slight tendency to lowering of the leukocyte count, and this is due to a fall in the granulocytes. No alteration in the blood picture followed the development of toxic symptoms, apart from an eosinophil increase. It appears that the drug has a slight depressant effect on the hematopoietic marrow; further investigation is necessary to show whether this is progressive, but so far aplastic anemia has not been diagnosed. These blood changes are not sufficiently serious to discourage the use of the drug, but they emphasize the advisability of carrying out frequent blood counts on those under treatment. A curious phenomenon observed in a number of cases was a progressive and marked fall in the blood sedimentation rate. This was not constant throughout the series but did occur in the majority of cases. The authors can offer no explanation for this phenomenon.

Journal of Physiology, London

96: 367-396 (Sept.) 1939

- Comparative Study of Effect of Interaction of Ions, Drugs and Electrical Stimulation as Indicated by Contraction of Unstriated Muscle. I. Singh.—p. 367.
Properties of Substance Liberated by Adrenergic Nerves in Rabbit's Ear. J. H. Gaddum and H. Kwiatkowski.—p. 385.
Effect of Monosaccharides on Water Absorption from Subarachnoid Space. T. H. B. Bedford.—p. 392.

Medical Journal of Australia, Sydney

2: 383-420 (Sept. 9) 1939

- Uterine Inertia and Contraction Ring Dystocia. G. S. Adam.—p. 383.
*Nutritive Value of Powdered Whole Milk. R. C. Hutchinson.—p. 392.
Use of Helium. G. M. Clough.—p. 400.
Hyperthyroidism Improved by Radiation Over Thyroid Area: Preliminary Communication. F. S. Hansman.—p. 402.

Nutritive Value of Powdered Whole Milk.—Hutchinson determined the nutritive value of a popular brand of powdered whole milk which is prepared in Australia from fresh Australian milk. In many parts of Australia it is no more expensive than fresh milk, and its keeping qualities are excellent. It was on samples of this product, bought in the open market, that the study was performed. The milk powder was reconstituted by the addition of the amount of water recommended in the directions. Compared with fresh milk, the reconstituted milk had a somewhat bleached appearance and a flat, slightly cooked taste. The flat taste was partly due to the absence of dissolved gases, for when the milk was shaken for at least thirty minutes in a glass jar and the lid was removed several times during the process, so that more fresh air was allowed to come into contact with the milk, the flavor was improved. The characteristic milky odor was a little more pronounced than in fresh milk. It was found that its nutritive value, compared both chemically and biologically with that of fresh whole milk, although not replacing the latter was an excellent substitute and in some of its properties was even superior.

Chinese Medical Journal, Peiping

56: 99-196 (Aug.) 1939. Partial Index

- Peking Diets: II. During Minor Illness. R. A. Guy and K. S. Yeh.—p. 99.
Observations on Chronic Effect of Sulfanilamide in Dogs and Monkeys, with Particular Reference to Blood. S. Y. P'an.—p. 111.
Management of Cut Throat: Review of Thirty-Eight Cases. J. Hua Liu and Y. H. Hsu.—p. 131.
Agglutinin Response Following Prophylactic Inoculation of Typhoid-Cholera Vaccine. S. B. Wang.—p. 145.
Sulfanilamide Therapy of Lung Abscess: Report of Case. Florence A. Hui.—p. 153.
Pneumococcal Empyema Treated by Local Irrigation with Sulfonamide. T. L. Kuo.—p. 155.
Occurrence of Blackwater Fever in New Territories of Kowloon Peninsula (Hongkong): Report of Case. P. P. Chiu.—p. 157.

Japanese Journal of Obstetrics & Gynecology, Kyoto

22: 131-216 (May) 1939

- Short Wave Therapy of Endocrine Diseases and of Carcinoma. J. Samuels.—p. 132.
*Menarche and Sterility. T. Mukuda and K. Horie.—p. 190.
Significance of Mikulicz Drainage, Especially the Significance for Prevention of Postoperative Infection. T. Mukuda.—p. 195.

Menarche and Sterility.—After reviewing earlier reports on the relationship between the menarche and sterility, Mukuda and Horie, in order to obtain information about this problem, conducted inquiries among the outpatients of the obstetric and gynecologic institute of the University of Kyoto. Their material consisted of several thousand cases. They found that in the sterile women the average age of the menarche was 14 years and 11½ months. This is only slightly later than the general average for Japanese women. At first glance this appears to contradict the view that sterility is especially frequent in women with a late menarche. However, detailed inquiry revealed that this is due to the fact that there are comparatively few women whose menarche is delayed. In grouping the women according to their age of menarche and then determining the incidence of sterility in each group, the authors found that the rate of sterility is relatively low in the women in whom the menarche was early but that it increases as the menarche is delayed. The incidence of sterility is especially high in the women in whom the menarche is delayed beyond the age of 17 years.

Revue Française de Puériculture, Paris

6: 49-96 (No. 2) 1939. Partial Index

- *Hypoglycemia by Hyperinsulinism in the Newborn. P. Rambert.—p. 49.
 Pulmonary Steatosis and Lipoid Pneumonia in Nurslings. F. Lautmann.—p. 63.
 Varicose Dilatation of Epicranial Veins of a Nursling: Deductions on Hypotiopathogenesis. J. Wertheimer.—p. 69.
 Intra-Uterine Fetal Respiration. M. D. Fenning.—p. 87.

Hypoglycemia by Hyperinsulinism in the Newborn.—Rambert thinks that the hypoglycemic accidents of the newborn which are brought on by excessive functioning of the islands of Langerhans are not given sufficient attention. These hypoglycemic accidents occur mostly in the newborn infants of diabetic mothers. These infants present a syndrome of hyperinsulinism comparable to the syndrome of langerhansian adenoma in adults. The hyperinsulinism is a defense reaction of the fetus to the maternal hyperglycemia. Its symptoms may be readily misconstrued and as a result the proper treatment may be withheld with possibly fatal results for the infant. The symptomatology is not characteristic, but the symptoms noted most frequently are cyanosis and convulsions. Cyanosis is usually the first to appear; it increases rapidly and is accompanied by respiratory disturbances. However, in some cases the coloration remains normal. Agitation is frequently observed and it is accompanied by hypotonia, flaccidity, nystagmus, trembling of the extremities and especially convulsive attacks. There are no cardiac disturbances, but in some cases the clinical aspects are those of collapse with pallor, sweats and a comatose state. Since the symptomatology is not typical, the diagnosis would be extremely difficult were it not for three factors: (1) the hyperinsulinism usually occurs in the infants of mothers with severe diabetes, (2) hypoglycemia can be observed in the infants during the postnatal hours and (3) the administration of dextrose generally arrests the symptoms, especially the cyanosis and the convulsions. The evolution of the hypoglycemia in the newborn depends to a large extent on the promptness of the treatment. However, the ultimate prognosis depends on whether hyperplastic lesions exist in the pancreas or whether the disorder is merely functional. The simple administration of dextrose solution makes possible a definite and complete cure in a great number of cases, at least in those in which the disorder is only functional. The injection of dextrose may have to be repeated in cases in which the hypoglycemic attacks recur. Epinephrine and maternal blood have been employed as adjuvants and, in case of cyanosis, inhalation of an oxygen-carbon dioxide mixture has been found helpful.

Cardiologia, Basel

3: 233-300 (No. 4) 1939

- Intermittent Sinu-Auricular Block: Solitary and Temporary Electrocardiographic Anomaly in Course of Acute Polyarticular Rheumatism. M.-P. Marcel.—p. 233.
 Aspects of Sinu-Auricular and Interauricular Conduction Disturbances. O. Spühler.—p. 244.
 Systematic Examination of Thoracic Leads in Normal Type of Electrocardiogram. J. Freundlich and E. Lepeschkin.—p. 269.
 *Changes of Electrocardiogram Brought About by Fear. F. Mainzer and M. Krause.—p. 286.

Fear as Cause of Electrocardiographic Changes.—Mainzer and Krause say that aside from the influence of fear on the cardiac rate, which is known from everyday experience, strong fear may induce considerable changes in the electrocardiogram. They observed such fear-induced electrocardiographic changes in the course of studies on the effect of anesthetics on the electrocardiogram. They took electrocardiographic records on the day before the operation, immediately before anesthesia was induced, once or several times during narcosis and again one or several days subsequent to operation. The patients on whom the observations were made were chosen at random from the surgical and gynecologic departments. The three classic leads were taken and the instrument used for this was an amplifier electrocardiograph. The electrocardiograms taken after the patients had been placed on the operating table, when compared with those taken the day before, showed in some of the patients insignificant deviations. These minor deviations are disregarded by the authors. In five patients without cardiac disturbances, the electrocardiographic records taken on the operating table showed considerable changes in comparison with those taken the day before. The authors regard these curves as pathologic and think that the changes were due to fear, for

the fear of the impending operation was quite evident in these patients. The authors differentiate two groups of changes. The characteristic features of the first group were that the ST descended below the iso-electric level and that the T deflection was reversed, which makes these electrocardiograms similar to those found in coronary insufficiency. The characteristic changes of the second group of electrocardiograms were increased amplitude of P and T and a more pointed outline of these two deflections. These electrocardiographic records resembled those of thyrotoxic conditions. As mentioned before, all these patients were highly irritable and overanxious regarding the impending operation. Other possible influences on the configuration of the electrocardiogram, as the effect of drugs, physical exertion and changes of posture, could be excluded. It is noteworthy that the mere elimination of consciousness through anesthesia repeatedly caused the curve to become similar to the original one. It can therefore be regarded as proved that fear, even in persons without cardiac disturbances, may produce considerable changes of the electrocardiogram. As far as it is permitted to draw a conclusion from the form of the electrocardiogram it seems probable that it is either the influence of the nervous excitement on the contraction of the heart muscle (by way of the sympathetic nerve) that predominates (group 2) or the (vagal) effect on the coronary circulation (group 1). The authors observed fear-induced electrocardiographic changes also in two patients with cardiac disturbances and found that in these they were especially severe. They conclude that a knowledge of such fear-induced electrocardiographic changes is important in order to avoid incorrect diagnosis of organic heart disease.

Schweizerische medizinische Wochenschrift, Basel

69: 825-848 (Sept. 16) 1939. Partial Index

- Enervation of the Kidney. E. Wildbolz.—p. 825.
 *Hiatus Hernia. E. Biro.—p. 830.
 *Early Diagnosis of Uterocervical Carcinomas by Means of Menstruation Calendars and Blood Curves. T. Marti.—p. 832.
 Bromine Content in Blood of Human Body. J. Karp and Gerda Wolfsohn.—p. 834.

Hiatus Hernia.—Biro gives a clinical description of five cases of hiatus hernia (age of patients between 51 and 63 years; sex not differentiated). These cases were selected from a large number not because of their exceptional character but because they illustrated, according to the author, the diagnostic difficulties of hernia detection in the initial stages, which usually elude the observation of the general practitioner. Roentgenographic discovery of hiatus is best effected with the patient in the recumbent position, head downward, stomach full and during inspiration. Much experience is needed and a trained eye to note suspicious conditions. One of the greatest difficulties is the presence of tonus fluctuations of the cardia in the same individual within a short period, in consequence of which temporary protrusion does not occur. According to the author, hiatus hernia does not constitute a disease entity but is secondary to other morbid conditions. It is of frequent occurrence.

Individual Menstruation Calendars.—Marti reports the use of menstruation calendars and blood curves as employed in the gynecologic division of the university clinics in Geneva. These calendars, simplified adaptations of Kaltenbach's and De Seigneux's blood curve ideas, are regarded as diagnostically valuable for the detection of initial uterocervical carcinomas, since they enable prompt evaluation of atypical and irregular hemorrhages and the early recourse to colposcopy and Schiller's test. The cards, measuring 15 by 11 cm. (about 6 by 4 inches) are issued for one year's use and reissued at the end of the year. The principal side contains the name, age, address, consultation hours of the clinics and sundry information on the significance of menstrual irregularities, the avoidance of self medication, the need of seeking medical counsel at an early date, even though no pain is experienced, and so on. The reverse side bears the calendar for the year. The bearer of this calendar merely crosses the days when her period occurred as well as those on which she observed the slightest atypical discharge. She brings the card with her when consulting the clinics, at which time her menstrual notations are transferred to the blood curve records kept by the clinics. The author thinks that the cause of individual and public health would be served by issuance of menstruation cards to adolescent girls in connection with

hygiene instruction in the schools and by their adoption by the medical profession, the more so as women are notoriously careless in noting hemorrhagic abnormalities and too prone to resort to self medication on dubious advice.

Annali Italiani di Chirurgia, Bologna

18: 559-669 (July) 1939. Partial Index

Cystic Adenoma of Kidney of Complicated Structure: Case. A. Scalfi. —p. 559.

*Main Principles of Surgical Treatment of Suppuration of Lung. S. Bigli. —p. 623.

Surgical Treatment in Suppuration of Lung.—According to Bigli, all forms of suppuration of the lung which are not controlled by administration of medical treatment within the first eight or twelve weeks of evolution call for surgical intervention. The author reports nine cases of suppuration of the lung, of various forms. He found that suppuration of the lung with multiple separate abscess is grave and has a tendency to chronicity. Chronic suppuration of the lung involves large territories of the parenchyma in a process of diffuse pyosclerosis and is complicated by secondary bronchiectasia with abscesses. Simple pulmonary abscesses which follow bronchial or pulmonary infections may be either solitary or multiple. Simple abscesses frequently evolve to solitary or multiple putrid abscesses which are clinically different from gangrenous abscess of the lung. The treatment of well circumscribed abscesses is as follows: pneumonectomy with detersion of the cavity of the abscess in simple solitary and simple multiple abscesses, and pneumonectomy with more or less ample resection of necrotic tissues followed by drainage with medicated gauze in simple putrid and multiple putrid abscesses. The operation is performed once in cases of solitary abscesses and it is repeated in cases of multiple abscesses. In cases of central, paralobar and deeply located abscesses the operation consists of paraffin plugging, which is followed in twelve days by pneumonectomy. Cortical abscesses call for an early pneumonectomy because of the fact that they are a menace and may either invade the pleura or rupture into it. In either case the treatment consists of pleurotomy followed by ample drainage. The surgical treatment of gangrenous abscesses gives satisfactory results only when it is resorted to early in the development of the abscess. It consists of repeated pneumonectomy and resection. The author concludes by calling attention to the importance of early x-ray diagnosis and early surgical treatment.

Deutsche Zeitschrift für Chirurgie, Berlin

252: 241-448 (Aug. 9) 1939. Partial Index

Function of Thymus and the Adrenals. H. Adler. —p. 241.
Microscopic Studies of Effect of Local Application of Certain Medicaments in Third Degree Burns. N. Anagnostidis. —p. 248.

Exophthalmic Goiter-Thymus Problem. P. Sunder-Plassmann. —p. 257.
Treatment of Chronic Bursitis with Pulmonary Extract from Swine. L. Stumpfegger. —p. 275.

*Further Experiments on Distribution of Tetanus Toxin in Animal Body. H. Bromeis. —p. 285.

*Influence of Pregnancy and Lactation on Mammary Cancer and Its Management. H. Bromeis. —p. 294.

Distribution of Tetanus Toxin in Animal Body.—Bromeis attempted to determine in experiments on guinea pigs and mice the proportion of tetanus toxin carried to the central nervous system directly by the regional motor nerve and that part which is first transported by the lymph and blood to the rest of the motor nerves and is then carried by them to the central nervous system. This was accomplished by injecting massive doses of the toxin, estimating the amount found in the regional motor nerve; by extirpating the depots of toxin and determining the amount contained in them by injections into mice; by estimating the amount found in the motor nerves away from the seat of the injections, and lastly by subtracting the toxin that has not been taken up by the nerves. It was found that the regional motor nerve takes up about two thirds of the injected toxin, while the remaining third is first carried by lymph and blood to other motor nerves to be transported by them to the central nervous system. The absorption of the toxin by the regional nerve takes place within the first hour after the injection and travels along the nerve toward the central nervous system at about the rate of 1 cm. an hour. The greater part of the incubation period (from one half to two thirds) is consumed by the process of combining the toxin molecule with the nerve cells of the spinal cord. The time occupied by the

transport of the toxin to the central nervous system constitutes a small fraction of the incubation period. The time required for the manifestation of symptoms after the bacillary infection amounts to from one day to one third of the entire incubation period, depending on the virulence of the bacillus and the local conditions. The prophylactic dose of antitoxin may therefore still be effective if given in larger doses on the second or third day of the trauma. His experiments, the author feels, not only do not negate the value of antitoxin but indicate the rationale of administering it at the earliest moment and in maximum doses. This is best accomplished by intravenous injections and local injection into the tissues between the wound and the regional motor nerve.

Influence of Pregnancy and Lactation on Mammary Cancer.—On the basis of 2,000 cases of mammary carcinoma and of 1,500 cases of carcinoma of other parts in female patients observed in the Tübingen clinic between 1911 and 1935, as well as on the observations of other authors and on his own experimental studies, Bromeis attempts to determine the influence of pregnancy and lactation on mammary cancer. It appears from his study that pregnancy and lactation exert the very opposite effect on carcinoma and that the incidence and the degree of malignancy of the cancer find themselves in the same relationship. Nulliparas and, even more so, women who do not nurse are more liable to the development of mammary carcinoma than others even though the carcinoma in their instance is somewhat less malignant. A large number of childbirths is likely, however, to increase the incidence and the malignancy of a later cancer because of the greater possibility of lactation alterations within the breast. Cancer of the breast develops exceptionally only in the course of a pregnancy but is then unusually malignant, the last months of pregnancy having a particularly unfavorable influence on the neoplasm. The exceptionally high-grade malignant condition here is not explainable on the basis of the patient's youth. An intervening pregnancy likewise exerts an unfavorable influence on the neoplasm. The latter, however, is not nearly as malignant as that which develops in the course of a pregnancy. Mammary cancers arising after childbirth are much more frequent but are less malignant, especially if lactation is practiced. Lactation appears to have a beneficial influence on the existing mammary cancer. Malignant transformation of a benign mammary tumor is particularly frequent in the lactation period. Bromeis was able to demonstrate in experiments on mice that pregnancy stimulates the growth of a carcinoma and that lactation retards it. The incidence of recurrences in animal experiments is lessened when pregnancy takes place shortly after operation. The recurrences arise not during the pregnancy but toward the end of the lactation period. In contrast to this, tumors removed in the course of a pregnancy recur with great rapidity. The author injected nucleic acid into tumor mice and obtained the same alterations in their breasts as those observed in pregnancy and lactation. These alterations exerted an influence on the growth of the tumor which paralleled that of pregnancy and of lactation. The former stimulated the growth of the tumor and the latter retarded it. He had also made the observation that more than one fourth of the women with mammary carcinoma were of the type presenting marked developmental weakness of the connective tissue. The hormonal influence of pregnancy and lactation was not clear. In his opinion a radical operation for mammary cancer without interruption of pregnancy is permissible within the first two or three months, provided that an early operation is possible and that the biopsy reveals a tumor of average malignancy. In all other instances a radical operation and interruption of pregnancy are indicated up to the third month. Pregnancy should be interrupted during the fourth and fifth months only when the existing mammary carcinoma is easily operated on and the life of the child is not of any particular importance. From the sixth month on, the interruption of pregnancy presents no advantage except that in the interest of prolonging the mother's life induction of labor during the seventh month is indicated. Pregnancy is to be interrupted in all advanced inoperable cases of mammary carcinoma. The termination should precede the radical operation by from two to four weeks. Benign mammary tumors are to be removed in the early stage of pregnancy. They are to be removed at once when observed for the first time during lactation. Castration in pregnant

women with mammary cancer is indicated only in the older patients close to the menopause; in younger women it is sufficient to prevent conception for the next three to five years. Castration is not indicated in cases in which the carcinoma was first recognized during the lactation period. The author likewise feels that sterilization is not to be recommended after a radical operation for mammary carcinoma in a woman during the child bearing period. It is sufficient here to prevent conception for several years and to keep the other breast under observation during, and especially after, a later pregnancy.

Geburtshilfe und Frauenheilkunde, Leipzig

1: 523-592 (Aug.) 1939. Partial Index

- Anemias of Pregnancy and Their Treatment. R. Hansen.—p. 523.
Clinical Evaluation of Leukoplakia of Vaginal Portion of Cervix Uteri. W. Bickenbach.—p. 553.
Clinical Investigations on Arrest of Lactation After Delivery of Dead Fetuses. B. Manstein.—p. 559.
Results of Treatment in Third Degree Perineal Tears. F. Mövers.—p. 565.

*Length of Twins at Birth as Sign of Maturity. W. Wolf.—p. 570.

Length of Twins as Sign of Maturity.—Wolf reports that in the course of a lawsuit on the paternity of twins the question arose whether twins who measured 47.5 and 46.5 cm., respectively, could be born 305 days post cohabitationem. The question was answered in the affirmative with the suggestion that twins are normally always shorter than azygous infants and that they could be born without signs of hypermaturity even after a gestation lasting that long. In view of the forensic importance of this problem, the author investigated the records of 400 twins born during the period from 1908 to 1938. After excluding those cases in which the mother's last menstruation was not definitely stated or the length of her menstrual cycle was irregular, as well as those in which dead or macerated fetuses were born, there remained 160 cases which seemed suitable for this investigation. They were classified in seven groups, depending on the length of gestation. The first group included those born after 231 to 240 days of gestation; the second group those born after 241 to 250 days and so on, the seventh group including those born after 291 to 300 days. The author agrees with Lüdi that for the estimation of the degree of maturity it is best to consider only the length of the longest of the twins. He found that after a gestation of from 270 to 280 days the length of the longest twin varies between 46 and 52 cm., the mean being 49 cm., that is, a length which does not greatly differ from that of azygous infants. The author regards it as extremely rare that twins are carried for longer than 300 days after the last menstruation. However, if they are carried past the normal term they seem to have at least the signs of complete maturity. According to the figures that are available so far, twins that are born before the eighth month of gestation seem to be longer rather than shorter than azygous fetuses that have been carried for the same length of time. This observation contradicts all expectations; however, in view of the small numbers, of the fact that sex of the twins has been disregarded and of other factors, this statement must be evaluated with extreme caution. The author reaches the conclusion that the statement (often made in paternity lawsuits) that twins need not show the signs of maturity after a normal length of pregnancy or may lack the signs of hypermaturity even if carried far beyond the term normally is not justified. Actually the length measurements established as a criterion for the maturity of azygous fetuses apply with slight deviations also to twins.

Münchener medizinische Wochenschrift, Munich

SG: 1261-1296 (Aug. 18) 1939. Partial Index

- *Hyperinsulinism. R. Thomae.—p. 1261.
Experiences with Bulgarian Treatment. H. Hechler.—p. 1264.
Vitamin A and Detoxin in Removal of Bacilli from Diphtheria Bacillus Carriers and Eliminators. Anneliese Klinzing.—p. 1267.
Blood Transfusion, Blood Transfusion Apparatus and Fluids to Substitute for Blood. F. Schöcher.—p. 1268.
Prevention of Distant Thromboses with Elastic Adhesive Compression Bandages. W. Leun.—p. 1271.
Water Exchange and Weather. Alter.—p. 1279.

Hyperinsulinism.—Thomae directs attention to a disease entity which is characterized by hypoglycemic manifestations. Hypoglycemia is observed (1) during adrenal insufficiency (Addison's disease), (2) during hypofunction of the thyroid, that is, during myxedema, (3) during insufficiency of the posterior lobe

of the hypophysis, namely, occasionally during diabetes insipidus and adiposogenital dystrophy, (4) during hypofunction of the anterior lobe of the hypophysis, such as in hypophysial cachexia and (5) during hyperfunction of the insular apparatus (hyperinsulinism) which is due to adenoma or carcinoma of the island cells or to insular hyperplasia. In order to arrive at the diagnosis of spontaneous hypoglycemia it is necessary to exclude disorders of the adrenals, the thyroid and the hypophysis. All earlier studies, especially those of Harris, who first described hyperinsulinism in 1924, brought clarification so far as they differentiated between functional hyperinsulinism, in which no changes are found in the pancreas, and hyperinsulinism, in which there exist changes in the island cells. To be sure, there still remains the problem whether the hypophysis is perhaps responsible for the so-called functional hyperinsulinism. The author describes in detail the history of a patient observed and treated by him. Discussing this case and the multiform symptomatology of hypoglycemia, he directs attention to Josef Wilder's suggested classification of "small," "moderate" and "great" glycopenic attack. The small attack has only few symptoms that are characteristic for hypoglycemia; there are sensations of hunger, sudden sweats and visual disturbances (swimming of objects before the eyes); irritability and quarrelsomeness are occasionally observed; heart action and blood pressure may be decreased or increased; fatigue, somnolence and excessive yawning are quite frequent. The only constant sign is that all these symptoms are counteracted by intake of sugar. The author believes that "small" attacks of hypoglycemia are not always recognized. He thinks that physicians should give more attention to the aforementioned complaints and that medication with sugar might perhaps lead to a correct diagnosis of such symptoms. In "moderate" glycopenic attacks the symptoms are about the same as in the "small attacks" but they are more severe. The "great" attacks are accompanied by threatening collapse and fainting, by temporary paralysis and blindness. Pallor and cold sweats are characteristic for beginning glycopenic coma, and lethargic and stuporous conditions have been observed. In remarks about the therapy of sugar deficiency, the author takes up diet, surgical treatment and treatment with insulin. For the dietetic treatment he recommends numerous small meals with a high carbohydrate content. Surgical treatment is necessary in case of neoplasm of the pancreas. The apparently paradoxical insulin treatment of hyperinsulinism was suggested by H. J. John, who reasoned that the exogenic administration of insulin would induce hypofunction of the insular cells. John recommends a diet with a high fat content and the injection of insulin after every meal. The author says that encouraging results have been obtained with this treatment and points out that Harris likewise attempted to reduce insulin production by diets with a high fat content. In the conclusion he expresses the opinion that glycopenic attacks are more frequent than they are diagnosed. He thinks that the sugar metabolism should be investigated of patients with repeated attacks of fainting as well as of persons, particularly children, who are easily fatigued.

Nervenarzt, Berlin

12: 385-440 (Aug. 15) 1939

- Encephalitides with Choked Disk. A. Leischner.—p. 385.
Question of Paranoid Involuntary Psychoses. H. J. Weitbrecht.—p. 394.
Diagnostic Observations on Tumors of Corpus Callosum. K. W. Essen.—p. 405.

*Treatment of Delirium Tremens. G. Säker.—p. 410.

Treatment of Delirium Tremens.—Säker directs attention to the fact that chronic alcoholism and delirium tremens are accompanied by impairment of the liver and that this hepatic disturbance can be influenced by treatment with insulin and dextrose provided anatomic changes do not prevent it. He says that Kral and his collaborators observed a favorable effect of this insulin therapy in chronic alcoholism. Moreover, they found that it has a sedative and an abridging effect on the delirium. The author, however, by giving twice from 5 to 10 units of insulin and dextrose, did not observe these effects on the delirium but did observe a favorable effect on predelinous, pseudoneurasthenic conditions and noted an accelerated disappearance of the psychosomatic symptoms that remained after the delirium. In two cases of delirium tremens he attempted to obtain results with preliminary shocks induced by means of insulin. In the first case a threatening circulatory collapse which

did not yield to cardiac and circulatory remedies could be counteracted by preliminary insulin shock. In the second case a severe delirium could be counteracted by preliminary insulin shock without resort to cardiac remedies or narcotics. Both of these patients presented a relative insensibility to insulin in that comparatively high doses were necessary to induce insulin shock. It is noteworthy that the gradual transition from preliminary shock to true shock was lacking and that only the deep shock interrupted the delirium. It is also interesting that the hallucinations and other signs of delirium disappeared only at the threshold of deep shock and that they reappeared when the shock was interrupted by means of dextrose. The improvement in the circulation, however, was effected before the shock. The author does not recommend this treatment for general use in delirium tremens because the delirium is not noticeably shortened by it and it is not without danger, but he thinks that it could be tried as a last resort in especially severe cases. He further discusses the use of vitamin B₁ in chronic alcoholism and its complications and expresses the hope that the further development of the insulin, dextrose and vitamin B₁ therapies will lead to a causal therapy of alcoholism and especially of delirium tremens.

Zeitschrift für Urologie, Leipzig

33: 481-552 (No. 8) 1939. Partial Index

- Extraction of Ureteral Calculi with Sling Catheter. H. A. Dege.—p. 486.
 *Trichomoniasis of Urinary Tract in Women. M. Rodecurt.—p. 487.
 Clinical Treatment of Stricture of Urethra. C. E. Alken and E. Zumach.—p. 498.
 Retroperistalsis of Urinary Passages in Hyperplastic Kidneys. K. Hutter.—p. 511.
 Renal Injuries by Dull Force and Their Sequels. H. Domrich.—p. 521.

Urinary Trichomoniasis in Women.—According to Rodecurt, in cystitis, ureteritis and pyelitis the possibility of infestation with *Trichomonas* is rarely considered. The female urethra harbors *Trichomonas* more frequently than is generally assumed. The majority of women with urinary trichomoniasis have simultaneously a vaginal or cervical leukorrhea, frequently combined with vulvitis, colpitis or erosions of the cervix, or they previously have had a nongonorrheal discharge. Primary trichomoniasis of the urethra is rare; more rarely still does trichomoniasis remain restricted to this organ or the urinary tract. The presence of *Trichomonas* does not necessarily cause symptoms. The infection may remain latent for a long period until symptoms are elicited by such factors as colds or catheterization. The subjective symptoms of urinary trichomoniasis are not characteristic. The patients may complain of burning or piercing pains in the urethra, frequent urge to urinate and vesical pains. A discharge from the urethra is usually overlooked or mistaken for a vaginal discharge, the vagina being nearly always more or less involved. Inspection of the external orifice of the urethra usually reveals nothing abnormal. In acute cases there may be reddishness, swelling and a white-yellow-greenish discharge from the urethra and perhaps also from the vagina. If the trichomoniasis is limited to the urethra, the examination of the urine for protein is usually negative. The fact that the catheter urine is entirely clear does not exclude the possibility of an infection with flagellates. Examination of the urethra may disclose nothing but a slight irritation, which may be ascribed to the mechanical manipulations involved in the examination or may be interpreted as "irritable bladder" or the nervous symptom of cystitis. It is characteristic for infection with *Trichomonas* that psycho-antineurotic therapy or the application of heat exerts no influence. Even urinary disinfectants and the remedies used for vesical lavage are ineffective. The diagnosis of trichomoniasis can be based only on repeated, careful examinations of urethral slide preparations. Following remarks about the technic of the examination, the author says that in the local treatment of trichomoniasis of the urethra he obtained the best results with a 3 per cent aqueous solution of chiniofon. He applies this solution by means of a tampon holder. Following saturation of the tampon, it is introduced into the urethra and is left there for about ninety seconds. This treatment is given every second day, at least twelve times. The genitalia must be treated simultaneously with the urethra. In cases of mixed infections, the customary urologic therapy must be added.

Acta Medica URSS, Moscow

2: 219-366 (No. 2) 1939. Partial Index

- New Observations Relative to Physiology of Digestion. I. P. Razenkov.—p. 219.
 Materials for Investigation of Stomach Function After Resection. V. S. Levit.—p. 275.
 Excretory Function of Stomach and Its Clinical Role. R. A. Lourja.—p. 310.
 Electrophographic Study of Automaticity of Stomach and Duodenum. J. I. Daichovsky.—p. 320.
 "Remote" Symptoms (Repercussion) in Nervous Diseases. M. B. Kroll.—p. 338.
 *Pathogenicity of Pure Cultures of *Spirochaeta Pallida*. P. S. Grigoriev.—p. 361.

Pathogenicity of *Spirochaeta Pallida*.—Grigoriev, working in the laboratory of the First Medical Institute of Moscow, claims to have succeeded in growing a pure culture of *Spirochaeta pallida*. Blood was taken from a vein of a patient with a diagnosis of primary serum negative syphilis and cultured on the Tarozzi medium. The patient gave a positive reaction three weeks later. No spirochetes were detected fourteen days after culture. However, reculturing yielded, six days later, a great number of typical spirochetes. This first "Moscow" strain was recultured every eight days and has yielded thus far thirty-eight generations. Intravenous injection of the pure culture caused in rabbits the appearance of typical primary lesions which contained numerous typical spirochetes. The passage of cultures in rabbits had the effect of increasing their pathogenicity. The passage of infected material from rabbits through white mice likewise did not attenuate the virulence of the organisms. The author believes that his cultures may be utilized for the preparation of antigen and for therapeutic and preventive vaccines.

Maandschrift voor Kindergeneeskunde, Leyden

8: 427-465 (Aug.) 1939

- *Treatment with Massive Dose of Vitamin D. Anny van Ormondt.—p. 427.
 So-Called Morbilli Bullosi. J. L. Keyser.—p. 437.
 Granulocytopenia. J. C. Schippers.—p. 450.

Treatment with Massive Dose of Vitamin D.—Van Ormondt reviews the literature on the treatment of rickets with a single large dose of vitamin D as well as on the prophylactic administration of a massive dose. This review indicates that rickets can be cured with a dose of 15 mg., that is 600,000 international units of vitamin D. Vitamin D₂ as well as D₃ can be used for this purpose. For the prophylaxis of rickets, from 7 to 10 mg. of vitamin D is sufficient. After discussing the indication for this so-called vitamin D "shock" therapy and vitamin D "shock" prophylaxis, the author describes three severe cases of rickets in which favorable results were obtained with this treatment. She says that in these cases improvement started later than in those reported in the literature and thinks that this is due to the fact that the required dose was given in two injections, with an interval of two or three weeks, rather than in a single dose. The treatment caused no harmful effects. In view of the great number of good results and the absence of symptoms of hypervitaminosis, vitamin D shock therapy and vitamin D shock prophylaxis can be considered a valuable addition to the therapeutic armamentarium of rickets. The author thinks that the vitamin D shock prophylaxis should be used more generally in cases in which prophylaxis with repeated small doses is difficult.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 4201-4292 (Aug. 26) 1939

- Necrosis in Diabetes. J. J. T. Vos.—p. 4202.
 Stenosis of Isthmus of Aorta. P. H. Kramer.—p. 4208.
 *Acetonemia in Pregnancy. E. Tonkes.—p. 4216.
 Conglomerate Tubercle in Spinal Cord. E. Hoelen and J. Tans.—p. 4223.

Acetonemia During Pregnancy.—Tonkes says that it is generally assumed that acetone develops when, in case of insufficiency of carbohydrates, fats must be burned to meet the energy requirements, and that ketone bodies develop also from proteins. He cites investigators who demonstrated that during pregnancy the acetone content is generally higher than is the case outside of pregnancy and that in pregnancies complicated by intoxications the acetone values are still higher. However, that a high acetone content of the blood and acetonuria may exist also in the absence of the well known causes the author demonstrates by means of a case recently observed by him. A woman aged 28, who was pregnant for the second time, had

hyperacetonemia and acetonuria, but no diabetes, hyperemesis or gestosis could be demonstrated as a possible cause. Increase of carbohydrates in the diet did not result in improvement; on the contrary, the acetone values showed a further increase after a diet with a high carbohydrate content had been given for a week. It was now decided to administer twice daily 10 units of insulin together with 100 Gm. of sugar. This combined administration of insulin and sugar produced the desired results. The author suggests that this is a case of the type which Broustet and Mahon referred to as "primary acetonemia of gestation." He also stresses that almost immediately after the administration of insulin the water elimination was greatly increased. He assumes that the hyperacetonemia was caused by a hepatic disturbance and directs attention to the fact that acetonemia plays a part in the intoxications of pregnancy, many investigators having observed increased acetone values in women with gestosis. Pregnancy increases the functional requirements of the liver, and the administration of sugar is an aid in the hepatic function; however, insulin is necessary for the utilization of this sugar. In this connection the author stresses the value of insulin in the treatment of the metabolic disturbances of pregnancy, especially the toxemias of pregnancy.

Acta Medica Scandinavica, Stockholm

101: 321-617 (Sept. 16) 1939. Partial Index

- Intravenous Saturation with Vitamin A. II. Groth and L. Skurnik.—p. 333.
The QT Interval, Its Connection with Clinical Effects of Digitalis, Strophanthin and Calcium. L. M. ter Horst.—p. 362.
Anorexia Nervosa and Hypophyseal Emaciation. G. F. van Dalen.—p. 433.
Transient Calcinoses Accompanying Ulcerative Colitis. II. Rasmussen.—p. 491.
Treatment of Exogenous Pellagra with Stomach Preparations, and Considerations on Possible Identity of Vitamin B₂ Complex with the "Cyanide Insensitive Enzyme Complex." E. Baudier.—p. 496.
*Metabolism and Cardiac Output in Normal and Diphtheric Children. P. Plum.—p. 511.
*Persistent Pain Localized at a Distance from the Heart (Shoulder, Epigastric Region) in Coronary Insufficiency. F. Mainzer.—p. 541.
Chondroitin Sulfuric Acids, Heparin, Albuminuria, Amyloid and Serum Proteins. M. C. Elström.—p. 551.
*Esophageal Spasm as Cardiac Symptom. J. Wahlberg.—p. 568.

Metabolism and Cardiac Output in Children.—Plum investigated the mechanism of circulatory impairment in diphtheria. As these studies required control determinations of the normal rate of metabolism and of the cardiac output, the latter were examined first in a number of children who could be regarded as "normal." Summarizing his observations on the metabolism in normal children the author says that he found that the metabolism in children may be determined with about the same degree of accuracy as in adults and that the intensity of the metabolism diminishes greatly with age, both when calculated per weight unit and per surface unit. The metabolism per kilogram of body weight is about twice as great in a child aged $3\frac{1}{2}$ as in a child aged 16. Also when calculated per surface unit the metabolism is found to decrease noticeably with age. In 100 experiments on twenty-two children the respiratory quotient was found to be on an average 0.83, varying between 0.80 and 0.89. Regarding the cardiac output of normal children, the author says that it, like the metabolism, is relatively considerably higher in children than in adults and relatively greater in younger than in older children. The tissues of a child aged 4 years are supplied with about twice as much blood per weight unit as are the tissues of a child aged 16. The arteriovenous oxygen difference is independent of the age of the subject and is the same in children as in adults. Attention is called to the fact that, in spite of their more intensive metabolism, children show no greater arteriovenous oxygen difference than do adults and that their circulation therefore in this respect possesses the same reserve force as that of adults, notwithstanding the relatively greater cardiac output. Summarizing his observations on the circulation and metabolism of children with diphtheria, the author says that the arteriovenous oxygen difference and the cardiac output were found to lie within normal limits throughout the disease. The skin temperature in the lower extremities was decreased during the stage of acute impairment of the circulation. Capillary microscopy showed decreased circulation in the capillaries of the skin. The metabolism was slightly decreased immediately after the cessation of the fever. The respiratory quotient was found to

be low in the febrile stage of the disease. These observations suggest that an essential cause of the circulatory impairment in diphtheria is to be found in paralysis of the peripheral vascular system, especially the splanchnic blood vessels. Whether myocardial changes are likely to bring about a fatal outcome cannot be decided at present.

Pain at Distance from Heart in Coronary Insufficiency.—Mainzer says that since Heberden the paroxysmal pain of angina pectoris radiating into the left or (more rarely) right shoulder and arm has been the object of intensive investigation. A considerable number of unusual types of radiating pain have since been observed. All these types of pain, however, have this in common, that they occur in paroxysms and are usually accompanied by manifestations of the heart itself (sensation of constriction, dyspnea, "heart pain" and so on). In this report, however, Mainzer directs attention to another type of pain, which is felt at a distance from the heart but which is equally associated with coronary insufficiency and must be carefully distinguished from that paroxysmal pain which occurs in angina pectoris. He considers cases in which during the period of pain there are no symptoms which can be connected with the heart itself. If the pain, which may be severe and may persist over weeks, occurs in a case in which the history shows coronary insufficiency, the diagnosis is not so difficult. If, on the other hand, the pain precedes the symptoms of coronary insufficiency, great difficulty is encountered in its classification and treatment. The author reports five cases in which coronary insufficiency occurred and isolated persistent pain was felt at a distance from the heart, namely in a shoulder or in the epigastric region. The pain persisted for weeks. Examination disclosed no local cause nor was the pain connected with circulatory symptoms. Four of the patients had myocardial infarction. The persistent pain came on either previously or subsequently to the infarction, but always separated from this event by a considerable time. Its localization was in every instance identical with that of the radiating pain during the infarction. This fact as well as the absence of any local lesions in the painful area indicates a causal relationship between coronary insufficiency and the pain syndrome. Another patient had a similar pain in the right shoulder. This patient had been suffering from aortic incompetence without angina pectoris, the coronary insufficiency becoming apparent by disturbances of the cardiac rhythm.

Esophageal Spasm as Cardiac Symptom.—Wahlberg reports three cases in which esophageal spasm occurred with cardiac decompensation. The first patient complained that for the last three days swallowing had been accompanied by pains behind the lower part of the sternum and the other two patients had similar complaints. The connection between the cardiac disturbance and the esophageal spasm was evident in all cases and in two of them it could be demonstrated by roentgenoscopy. The ages of the patients were 72, 69 and 76, respectively, and all three had peripheral arteriosclerosis. The first patient had a new cardiac infarct, the second one a chronic cardiac and coronary insufficiency and the third one a chronic cardiac insufficiency without signs of disturbance of the coronary circulation. The last two cases were in a stage of acute exacerbation. The author thinks that on the basis of his observations esophageal spasm can be classified with the symptoms that may develop in cardiac insufficiency. This small number of cases seems to indicate that relatively advanced age, severe peripheral arteriosclerosis and possibly also disturbances in the coronary circulation are predisposing factors. The esophageal spasm is of practical significance in that in its presence it is advisable to refrain from the diagnosis malignant tumor of the esophagus until careful examination and observation have ruled out a possible cardiac origin. The pathogenesis of esophageal spasm as a cardiac symptom is not readily explainable. X-ray examination in the author's cases indicated that mechanical pressure from cardiac or aortic dilatation played no part as an eliciting factor. The author thinks that it is necessary to postulate a visceral reflex mechanism from heart to esophagus by way of the sympathetic. In this connection he points out that the tonus of the esophagus is supposedly regulated by the sympathetic and that it has been demonstrated that lesions of the cervical sympathetic may elicit esophageal spasm. Finally it is known what dominating part is played by the cervical sympathetic in the elicitation of the pain in coronary disease.

THE STUDENT SECTION

of the

Journal of the American Medical Association

Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals

SATURDAY, NOVEMBER 25, 1939

STUDY OF ATTITUDES, PERSONALITY, SOCIAL FITNESS, ADAPTABILITY, CHARACTER AND MOTIVATIONS OF MEDICAL STUDENTS

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CHICAGO

The inter-medical schools council composed of students in Chicago's West Side medical schools for years has sponsored a program of extracurricular activities. Out of this experience grew an interest in personal and social problems of students which was further intensified by a study of the reactions of students to different types of school activities. In time many problems bearing on the life of medical students were brought into bold relief. Usually the problems concerned student attitudes and beliefs as they related to personal ethics and social issues. Typical questions were:

1. What do medical students expect from their education?
2. Is the general attitude of most medical students selfish?
3. Are most students unwilling to assume more than a minimum amount of responsibility in the conduct of community welfare?
4. Are students for or against greater socialization of all community services?
5. How do students really feel about religion? How do they regard the practices of the organized religious groups?
6. Does the medical student's professional training make him more or less sympathetic with human needs?
7. What does the medical training period do for his moral life?
8. What about his life philosophy?

Valid answers to such questions might be expected to have important relations to the vital personal problems uncovered in the routine academic work of medical students. Members of the inter-medical schools council agreed that an effort should be made to gather reliable information that might afford a sound basis for the study of such problems. A careful study of the activities and interest of medical students of the entire local community was instituted. Encouraged by the outcome in the home community, the council extended the investigation to include a wider field.

THE CLINICS

For the school season of 1939 a new type of activity was planned in the form of a series of student sponsored personal problems clinics. The general theme of the clinics finds its origin in a resolution on medical education adopted in Kansas City at the eighty-seventh annual session of the American Medical Association, which was as follows:

WHEREAS, The relationship between physician and patient embodies many factors that must be considered in the determination of an individual's fitness to be a doctor of medicine; and

WHEREAS, The entrance requirements to the degree of Doctor of Medicine cannot be evaluated on a strictly academic basis; therefore be it

Resolved, That the following factors be considered in the selection of students who are to become doctors: character, personality, social fitness, adaptability and motivations.

PURPOSE OF CLINICS

It is the purpose of the council sponsoring the clinics to deal concretely with personal student problems growing out of the general ideas indicated in the foregoing resolution.

The clinics serve as a focal point in a program designed to meet the growing demand of the large body of medical students for help in finding answers to the complex social, economic, religious and professional problems not touched on in the scientific courses of medical schools.

PROGRAM

Each clinic is under the leadership of a commission of several students and one or more faculty resource persons who, because of their experience, have a contribution to make to the analysis and solution of the problems. The personal problems to be faced by the various commissions have been determined by a series of student surveys and student sponsored questionnaires.

In the work of a clinic group no analysis of a student problem is considered complete

until the following control questions have been answered:

1. What are the actual facts involved, especially the underlying basic factors?
2. What makes this a problem of medical student concern?
3. What proposals are being made or have been made for dealing with this problem? (Be specific.)
4. Is there a recognized professional critique for the solution of this problem? (How is it stated?)
5. If there are generally recognized standards and critique commonly accepted in the judging of issues involved, are they sufficient for fast changing social requirements? (What concrete evidence do you have?)
6. What specific policy and suggestions can be made as the result of the work of this commission and this clinic.

LEADERSHIP

In conjunction with the clinic sessions, special conferences have been held with leaders in the field of medical and professional practice. Here the seasoned medical practitioner, the recognized medical educator and other qualified experts examine the major problems and issues arising out of the student clinics and in their discussions seek to provide guidance and information for the final analysis of such problems. Those who have directed discussions and advised with the student leaders are Dr. David Davis, dean of the University of Illinois College of Medicine; Dr. George E. Waklerlin, University of Illinois College of Medicine; Dr. Morris Fishbein, Editor of *THE JOURNAL*; Dr. Harry A. Overstreet, head of the department of psychology and philosophy at the College of the City of New York; Dr. William H. Welker, University of Illinois College of Medicine; Dr. Howard Sheaff, Rush Medical College; Dr. T. T. Job, Loyola University School of Medicine; Dr. F. L. Lederer, University of Illinois College of Medicine; Dr. Harry Oberhelman, Rush Medical College; Dr. G. B. Hassin, University of Illinois School of Medicine, and Mr. William H. Browne, University of Illinois School of Medicine. Much credit is due to these men for their leadership in the work of the clinics.

POINT OF VIEW OF MEDICAL STUDENTS

Experience in the work of the clinics to date emphasizes the importance of the investigations. More than 600 different students have attended and participated in the clinics; 3,200 different students have returned questionnaires and assisted with the surveys. The following statement seeks to summarize some of the observations:

There is evidence on every hand that an old order is passing. Rapid changes are taking place in the direction of greater social control. Individualism in economics, politics and social practice is being challenged and curbed, while various forms of collectivism are arising all over the world. There is much talk about the value of human personality. What is the real meaning of all this to medical students? Do present day professional training methods make professional leaders sufficiently sensitive to human need?

What is the real meaning of such expressions as Freedom and Responsibility as they pertain to the individual life? In our present social order, must the practicing medical man and woman accept the idea and then live as though freedom and responsibility are one and the same thing? How may the medical student interpret the statement "To live with complete freedom is to take the entire responsibility for one's own life and the lives of others as well." Is it true that students are forever trying to wriggle out of responsibility? What have students to say in answer to the often repeated statement "What so many students want is freedom from responsibility." Isn't it true that the seasoned medical man and woman must accept a great deal of responsibility that can never be paid for in dollars and cents? What is your attitude toward this?

Professional practitioners in the various fields of social service are hearing with growing frequency reference to group and state controlled schemes and plans for social service. Thought provoking questions pertaining to such subjects as socialized medicine, group hospitalization plans and free public clinics are raised and remain only to be unsatisfactorily answered.

Any change in traditional ideas, personal customs and institutions always brings conflict, disorder and general chaos. As graduate students and as medical leaders of tomorrow, students should be deeply concerned about the future.

We believe that we should become thoroughly aware of what is happening in the world today, both for the sake of our own insight and for our ability to interpret the changing social order. We believe that education is meaningful only in relation to the economic, social and personal conditions of the times. We recognize that it is all too easy to acquire a sideline attitude toward important issues—to become satisfied with mere intellectual speculation and to hold ourselves aloof from the realities of social, political, professional and personal problems. Social, health, professional and personal problems take on new meaning in practical application.

As medical students, we are preparing not only to be physicians but also to be active participants in the social life of the community in which we shall live and practice.

THE QUESTIONNAIRE

In order to provide a background for the discussions in the clinics and to establish their proceedings on a reliable basis, questionnaires were formulated and circulated among the students of all the medical schools.

The response to the questionnaires exceeded all expectations. Not only did the replies provide the desired basis of reliable data, but an even more intensive study resulted from this source of student expression and the council has decided to continue the clinics for another year. Eighty-seven per cent of all the questionnaires circulated among the entire enrolment were returned and tabulated. According to the experiments of statisticians, the answers of even one tenth of a group, when it includes several hundred individuals, yields results much like those which would be obtained if every individual in the group had answered, provided no selection in the choice of the one tenth of the group has taken place. But our study was not content to stop with one tenth of the group.

The entire returns were tabulated and the final results represent 87 per cent of the total questionnaires circulated. We feel certain that the tabulations of this high percentage represents a true picture of the general attitudes and beliefs of medical students enrolled in the medical schools on the questions included in the questionnaire.

MEDICAL STUDENTS' QUESTIONNAIRE

Please do not sign your name! Your help is requested in gathering honest information regarding what professional students do and think. The answers to the questions, when compiled, will provide a substantial basis for the discussions of the Medical Students' Problems Clinics, of the West Side Professional Schools Y. M. C. A.

Please be honest. In no way will there be any attempt made to identify you with your answers.

Q.—Sex? Q.—Age? A.—Average 26. Q.—Married? School? Year? Years in college?

Q.—Parents: Profession? Race? Religion? A.—Protestant first, Jewish second, Catholic third.

1. Q.—What are your real reasons for entering the profession for which you are studying? Please number them 1 for most important and 2 for second, and so on.

A.—Easy work —. Social position 4.2%. Chances for marriage —. Taste 30%. Aptitude 3.8%. Opportunity for service 49%. Money 3.8%. Parental pressure —. Advice of others 4.2%.

2. Q.—Do you work outside? A.—65% yes, 35% no. Q.—Do you feel that outside work in moderate amount is a handicap? A.—60% yes, 40% no.

3. Q.—Outside of studies and sleep, what are your principal activities? Please rank them in order of time spent, 1 for first and 2 for second, and so on.

A.—Reading 40%; "Bull sessions" 6%; Drinking —. Opposite sex 2%. Movies 8%; Outside work 44%.

4. Q.—Do you spend time on a hobby? A.—46% do, 54% do not. Q.—If so, what? A.—Photography first, stamp collecting second, books third.

5. Q.—What is your favorite magazine? A.—First choice *Reader's Digest*, second choice *Life Magazine*.

6. Q.—Do you ever stay up the major part of the night to study for an exam? A.—52% do, 48% do not.

7. Q.—Do you follow a regular study schedule? A.—51% yes, 49% no.

8. Q.—Do you ever carry "crib notes" to exams? A.—75% do not, 25% do.

9. Q.—Do you condemn those who do? A.—55% yes, 45% no.

10. Q.—Do you accept information from your neighbors during an exam? A.—30% yes, 70% no.

11. Q.—Do you give such information? A.—56% yes, 44% no.

12. Q.—Do you think the honor system would work in your class? A.—21% yes, 79% no.

13. Q.—Do you always attend classes when attendance is not taken? A.—42% do not, 58% do.

14. Q.—Of your instructors the past term, how many would you rate in each group? A.—Excellent fourth, good third, fair first, poor second.

15. Q.—Please number, in order of importance, the characteristics you believe an ideal instructor in your professional school should have. A.—Technical knowledge first, pleasing personality first, clarity of expression first, clear speaking second, general information third, lucid thinking fourth and research ability fifth.

16. Q.—Do you feel that the students in your class are overworked? A.—60% yes, 40% no.

17. Q.—Should an instructor take his personal opinion of a student's suitability to a profession into consideration when passing him or failing him? A.—70% no, 30% yes.

18. Q.—If it were legal, would you perform abortions on unmarried women? A.—68% yes, 32% no.

19. Q.—Would you tell "white lies" to patients? A.—98% yes, 2% no.

20. Q.—Would you do plastic surgery for beauty's sake? A.—64% yes, 36% no.

21. Q.—Do you believe in "mercy deaths" in incurable disease? A.—22% yes, 78% no.

22. Q.—Has your professional school made you more aware of human need? A.—74% yes, 26% no.

23. Q.—Of what political faith are your parents? With what political faith do you now sympathize?

21. Q.—Do you believe in government control of production? A.—84% no, 16% yes.

25. Q.—Are you prejudiced against Jews? A.—22% yes, 78% no. Q.—Are you prejudiced against Gentiles? A.—94% no, 6% yes.

26. Q.—Would you date a person of a different race? A.—80% yes, 20% no. Q.—Marry one? A.—95% no, 5% yes. Q.—Room with one? A.—64% yes, 36% no.

27. Q.—Do you go out of your way to help others? A.—21% no, 79% yes.

28. Q.—Do you favor women smoking? A.—10% no, 90% yes. Q.—Do you prefer modern women to the "old fashioned" girl? A.—88% yes, 12% no.

29. Q.—How would you rate nurses morally compared to other groups of women? A.—12% lower, 76% equal, 12% higher.

30. Q.—How do you rate male professional students morally to other groups of men? A.—9% lower, 82% equal, 9% higher.

31. Q.—Do you believe that women are the mental equals of men? A.—93% yes, 7% no.

32. Q.—Do you use alcoholic beverages frequently? A.—72% do, 28% do not. Q.—Do you condemn those who do? A.—92% no, 8% yes.

33. Q.—As companions, do you prefer those who drink or those who do not? A.—76% yes, 24% no.

34. Q.—Do you ever indulge in extramarital sexual intercourse? A.—16% do, 84% do not.

35. Q.—Do you condemn engaged couples who do? A.—58% no, 42% yes. Q.—Do you condemn others who do? A.—54% yes, 46% no.

36. Q.—Have you been in a house of prostitution more than once? A.—7% yes, 93% no.

37. Q.—Have you ever had a venereal disease? A.—Three reported yes.

38. Q.—Do you attend church regularly? A.—15% yes, 85% no. Q.—Would you be as well off if you did not? A.—64% no, 46% yes.

39. Q.—Could you do as well without church? A.—86% think they could, 14% no. Q.—Do you believe in God? A.—98% yes, 1.5% no.

40. Q.—Are you tolerant of those who do not? A.—95% yes, 5% no.

41. Q.—While attending professional school has your attitude substantially changed toward:

God? A.—Yes. Q.—Study? A.—Yes. Q.—Sex? A.—Yes.

Q.—Your profession? A.—Yes. Q.—Church? A.—Yes. Q.—The race problem? A.—Yes.

42. Q.—What could an ideal church do for you? A.—Give faith, inspiration, belief in mankind.

43. Q.—In a few words, tell what is your greatest problem. A.—Financial first, problem of adjustment to new ideals fourth, getting through school fifth, family sixth, setting up practice seventh.

Thank you! If you are interested in attending sessions of the clinics you may secure application blanks at West Side Professional Schools Y. M. C. A., 1804 West Congress Street, Chicago.

CLINIC DISCUSSIONS

Personality Clinics.—In this clinic questions 1, 4, 5, 14, 15 and 41 were discussed.

Summary of Clinic Session: Technical knowledge and pleasing personality are major requirements for the successful doctor, dentist, pharmacist and nurse. Effective personality is an absolute necessity. Persons with the highest technical knowledge are not necessarily the best but those with combined traits of personality along with technical knowledge. Personality is not a substitute for technical skill and technical skill alone cannot suffice for the lack of personality. The professional student needs technical knowledge but it is also important that he acquire that kind of personality setup which makes him effective with his fellow men. And this can come only through participation in general interest and activities.

Motivations Clinic.—In this clinic questions 1, 2, 3, 22, 24, 27, 38, 39 and 42 were discussed.

Summary: Too many students seem to have everything to live with and apparently nothing to live for. They are rich in possession and poor in purpose. Objectives that are sufficiently large to command all the power we possess for their achievement, and are good for all concerned, must be earnestly sought as the basis for a well balanced, healthy life.

Character Clinic.—In this clinic questions 8, 9, 10, 11, 18, 19, 21, 29, 30, 32 and 33 were discussed.

Summary: The basic requirement of good character is honesty. The great doctors, dentists, pharmacists and nurses have all been per-

sons of integrity. Every student should ask himself "Am I honest?" "Have I ever been found guilty of dishonest practice?" In professional practice a man is in the midst of some of the most intense social problems and he may also be tempted to engage in some of the worst practices known to society. He must be basically honest if he is to be great in his chosen profession.

Social Fitness Clinic.—In this group questions 1, 4, 5, 7, 8, 9, 12, 13, 19, 20, 25, 27, 32, 34, 37, 38 and 39 were discussed.

Summary: The social world has many elements and it is not divided into distinct economic, political and historical parts. Not only are the various social sciences closely related but it is becoming increasingly apparent that the position one takes on numerous social questions is in part determined by philosophical as well as by scientific considerations. We believe that the time has come when it may be just as important for students to know whether they believe in the philosophy of the many different forms of government current in the world as it is to

know how they are organized. In a word, the professional student becomes socially fit through his understanding of the philosophy of his profession, his government and his society as well as through his participation in the various forms of government.

Adaptability Clinic.—Here questions 5, 15, 18, 20, 21, 22, 23, 24, 31, 41 and 43 were discussed.

Summary: In the discussions of the Adaptability Clinic several conclusive points were reached; mental, emotional and physical good health must be regarded as fundamental to the enjoyment of life. Mental, emotional and physical health in an individual signifies the adjustment to living conditions. Every aspect of college life affects the student's mental, emotional, spiritual and physical state. The individual's mental, emotional and physical health program is necessarily interwoven into each day's activities. It is therefore imperative that the student plan his schedule so that these important phases of life will balance each with the other.

1804 West Congress Street.

Comments and Reviews

STUDY OF THE PATIENT AS A WHOLE AS TRAINING FOR MEDICAL PRACTICE

Abridgment of an article by Dr. G. Canby Robinson, Lecturer in Medicine, Johns Hopkins University School of Medicine, Baltimore, published in the Journal of the Association of American Medical Colleges, March 1939.

I wish to discuss the advantages of home visits by medical students as bearing especially on the study of the patient as a whole, which includes consideration of his personality, environment and social setting.

Medical practice requires an understanding of the motives and circumstances that bring the patient to the doctor. Except in cases of acute serious disease or injury, patients usually seek medical care because of social incapacity. The great bulk of illness, representing progressive disease or the processes of aging in their incipient stages, chronic infections and inflammations, and disturbances of metabolism and of bodily functions of psychogenic origin, reveals itself to the patient as an inability to carry efficiently the responsibilities of his family, of his work or of other situations he is called on to face. It is this sense of inability from which comes fear or worry, uncertainty and a feeling of insecurity. The patient is primarily concerned with being restored to his accustomed place in society whether he consciously realizes it or not. For this reason an understanding of the conditions

and obligations of the accustomed place in society to which each patient hopes to be restored is a requirement of medical practice. This concept should be appreciated by the medical student and should be incorporated into his attitude toward an understanding of medical practice early in his clinical training.

The interaction between the patient and his social setting is an important factor in the causation of illness and in its treatment, as there are specific social problems related to various types of disease which require consideration both in diagnosis and in treatment. A systematic study of an unselected series of medical patients admitted to the Johns Hopkins Dispensary has shown that in 65 per cent adverse social conditions related to their illness existed and that in 35 per cent these conditions caused emotional reactions mainly responsible for their illness. It seems clear that if medical students are to understand illness and its treatment in a broad sense they must be taught to consider the patient as a total individual. Activities in this field have recently been introduced into the curriculum of at least thirteen medical schools in this country, and various methods for their conduct have been instituted. I am convinced that these new undertakings in medical education are destined to have a useful influence on the attitude of the future doctor toward illness and on medical care in general, by developing a wider interest and a better understanding of the patient as an individual.

DETAILS OF THE PLAN

Our plan is to assign at least one patient to each third year student for study as a total individual during his work in the medical dispensary. A suitable patient is selected from the new cases assigned to each student, so that he may participate in the broader study of a patient he already knows both personally and medically. A suitable patient is one who has a more or less protracted illness, requiring treatment in the medical clinic, and who lives near the hospital so that a home visit can be made conveniently.

The patient is selected by conferring with the student and with the staff member responsible for the case, and the patient is interviewed after the clinical record has been reviewed. At this interview the patient's symptoms are reviewed and expanded. A social history is obtained, and the assets and liabilities in the circumstances of the patient's life in relation to his illness are determined. The patient is given an opportunity to relate his social and emotional disturbances, and at the same time characteristics of personality are noted. Immediately after the interview it is fully described by dictation, thereby providing a record for future study. This interview is usually conducted in an office outside the clinic, where an intimate doctor-patient relationship is easily established and the student for practical purposes is, as a rule, not present, but the record is reviewed with him shortly thereafter. Plans for a home visit with the student are made at the time of the interview.

After the study has progressed sufficiently to give an understanding of the patient as a whole, the patient is presented by the student at an informal weekly conference attended by all the students in the medical group, about twenty-five in number, and covering the whole class in three groups. The student presents the essential medical aspect of the case with the patient present, and after a brief discussion with the patient in order to bring out his personality the patient is asked to withdraw. Then his social and personal problems are described and discussed. Emphasis is placed on the relation of these problems to the patient's illness and its treatment, and consideration is given to the problems of health and hygiene which the patient may present or suggest.

These conferences are attended by the public health administrator of the district, by medical social workers and frequently by staff members of outside social agencies interested in the patient presented. A psychiatrist has attended constantly during the past two years, and visitors from the board of health, from the School of Hygiene and from other departments of the medical school have attended and participated in discussions.

There are eight conferences for each group, and it is customary to present to each group patients illustrating the social aspects of circulatory disease, pulmonary tuberculosis, psychoneuroses and syphilis, while patients with diabetes, epilepsy or other chronic diseases have been presented. Cases have also presented opportunities to discuss the relation of illness to industrial employment, the problem of permanent invalidism, the methods of utilizing the resources of various public and private health and welfare organizations, and other such topics.

BREADTH OF FIELD COVERED

The study of the patient as a whole frequently leads the student to a consideration of problems of public health and of mental hygiene, or it demonstrates the significance of adverse social conditions in the diagnosis and in the treatment of illness.

This method of treatment is neither simple nor easy. Much time and energy are required to coordinate all the human elements that are concerned with its successful conduct. These human elements consist of patients, students, doctors, medical social workers and representatives of public health and social agencies. It has not been possible to have all students make a complete study, but about 60 per cent of each class have done so.

This program of teaching has been combined with systematic studies of the social aspects of illness and with problems of treatment in conjunction with the routine medical service of the hospital staff. These activities have required the full time of a physician, a social worker and a secretary, constituting a small division of the department of medicine, in which efforts are being made to keep accurate records and to accumulate recorded experience as material for study, analysis and formulation.

Several points in this plan of teaching are advantageous in the training of the doctor. The medical student takes a broad view of at least one patient in whom his interest has already been aroused by taking the history and by making the initial examination. When the student has an opportunity to see the patient in the environment of his home, the case becomes a human as well as a medical problem. For this reason it is more deeply impressed on him and he invariably gains a lasting memory of the patient, which includes not only the individual but also the disease or disability from which he suffers. The method of teaching serves to introduce the student to phases of hygiene and public health as related to clinical medicine and to demonstrate the integration of medical practice and public health. It also serves to indicate the relation of various social agencies to medical care and the numerous factors

which may need to be coordinated in considering the total health needs of an individual. Although only relatively few topics are considered by the students, the conferencees serve to cultivate an attitude of mind and to evoke a humanitarian spirit that might otherwise be repressed during the period of early clinical training. The students have an interest in their patients as individuals and are glad to have an opportunity to give expression to this interest. This field of study gives the student the idea that there is no sharp line of demarcation between medicine, psychiatry and public health; that the psychobiologic concept of the patient is applicable in various fields of medicine, and that the study of the patient as a whole has a direct bearing on medical practice.

There is need of placing greater emphasis on the study and treatment of the patient as a whole in these days of advancing specialization.

THE PLACE OF PHYSIOLOGY IN CLINICAL TEACHING

Abstract of Mayo Foundation Lecture presented by W. H. Ogilvie, M.D., London, England, at Rochester, Minn., Oct. 18, 1937, and published in Proceedings of the Staff Meetings of the Mayo Clinic June 22, 1938.

Above all things the surgeon must be an expert in topography. His anatomic knowledge must be so detailed that no problem can find him unprepared, so thorough that it is part of his subconscious mental processes. He can acquire this knowledge only by prolonged and painstaking work. But anatomic learning, which in the early days made up the whole scientific equipment of a surgeon, is today only the beginning and foundation of his art. The surgeon who regards only structure cannot advance his subject except in technical detail or even do his day's work with intelligence and insight.

It may appear that intelligence and insight are unnecessary to a manual worker, that the limits of technique have been fully explored and that nothing remains but to repeat those procedures that have already been perfected. Yet it does not follow, because no striking innovations are to be expected, that further advance is unlikely. It is impossible to visit several centers in succession, as I am doing at present, without being astonished at the great divergence in the methods used by surgeons of ability to treat the same disease. Which is right? Surgery is not complete until we can give the answer to this question, and we can only do so by applying the test of function. We must turn to physiology, the province of which is the study of function.

Physiology inquires how the viscera are normally kept in position, how this normal mechanism has failed in visceroptosis, how far the

symptoms are due to altered position, and how the normal function and support can be restored. The viscera are kept in shape by the tone of their own walls and in position by the tone of the abdominal muscles and pelvic floor. Failure is due to lack of tone, and tone in turn is dependent on influences from higher centers, and ultimately on psychologic control. The treatment of visceroptosis is therefore the restoration of tone, psychologic tone, tone of the abdominal muscles and tone of the visceral walls.

I may choose the muscular system to illustrate the tendency toward departmental knowledge. In anatomy we learn the attachments and nerve supply of each voluntary muscle and regard its actions as a piece of elastic. In physiology we study the behavior of nerve muscle preparations from the frog and pass on to the more general characters of the activity of striated and plain muscle. In clinical surgery we think of muscles chiefly as things that may be injured or that interpose barriers to structures we wish to reach. We seldom pause, except in orthopedics, to consider them as the chief constituents of the human body or to apply that knowledge of the living muscular system as a coordinate whole. This idea we owe, in the main, to the work of Sherrington. This knowledge does, however, color orthopedic teaching and practice at present. We are taught to recognize two types of activity, the phasic and the tonic. We know that a muscle may be strong in the phasic sense yet grossly deficient in tone. As surgeons we should be alive to the need of preserving abdominal tone which is lost after abdominal operation.

We cannot go through the abdominal muscles by peaceful penetration. We must cut them. We should so plan our incisions that they do no permanent harm and interfere as little as possible during the process of healing with abdominal movements, and we should so close them that the muscles may be used from the start without risk of damage. A perfect incision would divide all structures along their lines of stress, so that contraction tends to approximate rather than to separate them and the stitches do no more than obliterate dead space. Thus the gridiron is the only incision against which no criticism can be directed. For any but small operations, however, we must divide the rectus sheath although we should hesitate to cut the muscle itself. Such a wound, well healed, leaves the abdominal wall undamaged.

It is of little avail if we enable our patient to use his abdominal wall but do not allow him to do so. As a physiologic mechanism the abdominal wall demands activity. A well sutured wound has a tensile strength of about 40 per cent of that of the tissues before they were cut. During the first few days the tissues

undergo autolysis while the sutures are being digested. By the fourth day the strength of the wound has sunk to some 20 to 25 per cent of the original. From the fifth day onward fibroblasts are laid down rapidly and the strength increases, so that by the sixth day it is 50 per cent and by the tenth day about 90 per cent of the normal. It appears, therefore, that wound rupture is most to be feared between the third and the fifth day, and after that it becomes increasingly unlikely. But while repair requires rest it is not necessary to rest the whole muscular system, or even the whole abdominal wall, nor need rest mean rest in one position. Let us set our faces against the routine use of the encircling bandage and the Fowler position. As soon as the chart indicates a reestablished circulation and freedom from chest trouble, it is unnecessary to prescribe any particular position. The patient may be allowed to lie on his back, his side, his face or curled up, as previous habits dictate and present comfort allows. His protective reflexes will guard the wound from undue strain. But to allow or force him to walk before the tenth day is to permit physiologic idealism to override pathologic common sense.

Before I leave the topic of the abdominal wall I would touch on the layer that most concerns the patient, the surface one. The skin has many metabolic functions, but I shall think of it now only as a flexible and almost indestructible cover, yielding to all movements of the body without pain and without tension. We must traverse the skin to reach the underlying parts, but the less trace we leave of our passage, the less shall we interfere with its free movements afterward. Cosmetic surgery may seem to be far from physiology and entirely out of place in the abdomen, but a beautiful scar is more than a work of art: it is an indication of healing not merely by first intention, but without any recognizable reaction of repair it means that any subsequent operation will find tissues in appearance and texture equal to normal. We can have scarless surgery only by operating where there is a scar already. Creases are scars, that is they are fibrous intersections passing from the skin through superficial fascia to the aponeurosis below. They are fixed because they lie in a plane of no movement, and an incision placed along them will not merely heal beautifully because it remains approximated with the aid of stitches but it will not subsequently interfere with or limit movement.

My theme, in short, is to suggest that we may occasionally turn the torch of inquiry backward as well as forward, look for that which has been forgotten as well as that which has not yet been discovered, and try to piece the work of others into our daily task.

THE MEDICAL RACE

Abstract of an inaugural address delivered by Robert Hutchison, M.D., D.Sc., LL.D., at the opening of the session of the Westminster Hospital Medical School, October 3, and published in the Lancet Oct. 8, 1938.

I wish today to give you some advice on how to run the medical race. I have been over the course and can perhaps warn you of some of its difficulties. I should like to congratulate you. I would commend it on the grounds that medicine is an interesting, intriguing and even amusing occupation in which, although with all its labors and langors you may often know fatigue, you will at least escape boredom; that it gives opportunity for the exercise of your physical, mental and moral powers and that it offers an admirable field for the study of human nature in the raw. It is customary to say that although it is easy enough to earn a living in medicine it is difficult to make a fortune in it. But in no learned profession is it easy to make a fortune, and on the whole doctors are quite well paid and they have this further advantage that their skill, once acquired, is marketable all over the globe, for disease is everywhere the same.

THE NUMBER OF COMPETITORS

Today's ceremony corresponds for many of you to the fall of the flag starting you off. Some of you may be feeling a little dismayed by the large number of competitors. I was half a century ago, for there were more than 400 men in my year at Edinburgh. I advise you not to be discouraged. The saturation point does not seem even yet to have been reached and the scope and amount of medical work are always increasing. As Dean Inge, I think, has said, though Democracy may starve the clergy and the practitioners of the arts, it will always demand doctors.

THE HURDLES

I want to remind you that this race is a handicap race; you don't all start level. Nor is there any use in pretending that the handicapping is fair. Some of you will carry weight all through the course because of poor health, lack of intelligence, inborn laziness, shyness or a bad manner. Others may be burdened by poverty if that is really a handicap. Rightly regarded it may be a spur; indeed it might be said that the rich parent can give his son every advantage except poverty. A few of you may handicap yourselves by habitual idleness or by the acquisition of vices or debts.

The race is not really very long. Eight laps of five years each will see the end of it for most of you; and although forty years may seem a long time to look forward to it is surprising how short it is in retrospect. The first lap, as many of you have already realized, is a hurdle race, the hurdles being the examinations. I refuse to diverge into a discussion of medical education,

which will still be under consideration when the day of judgment arrives, but, in the last resort each of you will have to train himself. If I have any guiding principle in teaching the medical art it might be summed up in the saying You must get as early into contact with patients as you can. We will suppose you then to have completed the first lap. You are now out of the hands of your trainers and in open country where the race becomes a point-to-point and each can choose his own line, and here you may go astray in various ways.

You may run up a blind alley. There are many of these opening out of the course and some of them look attractive; so-called research posts of one kind or another and small institutional jobs are amongst them. Beware of these; they offer an immediate reward in pay but are apt to lead nowhere. Above all, shun research posts—the “lure of the laboratory”—unless you feel in yourself the curiosity and restlessness of the born investigator.

Second, you may be tempted out of your course by the desire to make a good income quickly. This is the bait which may draw you down one of those blind alleys; but even if it does not do that it may result in your starting on a definite path when, if you had taken time to study the country properly, you might have found another that would have suited you far better. I don't like to make generalizations about the rising generation, but I think that the newly qualified man is more mercenary in his outlook now than he used to be.

The third danger against which I would warn you at this point is the premature engagement; indeed, it may easily be the cause of your running into either of the two false courses to which I have already referred. Don't make a three-legged race of it too soon. I know the sentimental reasons in favor of doing so—the “stimulus of having some one to work for” and so on. I remember too the advice of the old lady: “Young man, don't be a doctor. You can't marry till you get a practice and you can't get a practice till you are married.” It remains true that at this stage of the race “he travels the fastest who travels alone.” When Eros calls, you are not likely to remember this advice; but, as Sir William Osler used to say, “You must learn to keep your emotions in cold storage.”

CHOICE OF A LINE

Having escaped these hazards, you have to choose your line of country. I would advise you not to decide hastily but to have a good look round first and get as much general experience as you can by doing resident appointments. On the other hand, it is unwise to hold such posts too long; sooner or later you must strike out on your own. Don't become an appointments addict.

There are plenty of lines to choose from, for in the house of Medicine are many mansions; but I suppose the majority of you will find yourselves in general practice. I am not going to throw boquets at the general practitioner, for he needs no praise of mine. It is customary to describe him as “the backbone of the profession,” but I prefer to regard him as the soldier in the front line of the medical army who has to withstand, often single handed, the first assault of disease. He is all the more to be envied on that account. A man in a good country practice particularly is a real doctor, not a mere sorting machine for consultants or hospitals, and is probably living as full, useful and happy a life as our profession offers.

I may warn you of another danger in the race. Those of you who have read the Pilgrim's Progress may remember that at one point Christian was joined by two men, Formalist and Hypocrisy, who got into the way of climbing over the wall instead of entering by the gate, and you will find in the race of practice that some persons get on to the course without having first jumped the hurdles. We call these quacks and, like the two men of Bunyan's vision, they come from the land of Vainglory and we may say to them, as Christian said to Formalist and Hypocrisy, “You walk by the rude working of your fancies.” I should advise you not to regard them as real competitors and above all never to imitate their methods of running. They may beat you sometimes in treatment, for patients still like magic, but in matters of diagnosis you will always leave them standing.

THE MEANING OF SUCCESS

If you ask what makes for success in the race of practice I cannot tell you. It is not knowledge or manners, for a doctor may achieve a large practice without either of these. The power of inspiring confidence is possibly the one thing needful, but I really don't know. Everything depends on what one means by success. Some estimate it in terms of money and it is foolish to say that this does not count; some think of honors of one sort or another, but these are of little value unless bestowed by one's fellow competitors. Let us agree that so far as practice is concerned that man has succeeded who has gained both the affection of his patients and the esteem of his colleagues.

When all is said and done, ours is a race in which there are many kinds of success and no one winner. Perhaps it is not so much where you come in as how you ran that matters.

They win who never near the goal,
They run who halt on maimed feet,
Art has its martyrs like the soul—
Its victors in defeat.

And that is true of the art of medicine.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Annual Meeting of Association of Medical Students

The fourth annual meeting of the Association of Medical Students will be held at the Detroit-Leland Hotel, Detroit, December 22-29. Among the speakers will be Drs. Morris Fishbein, Chicago, Editor of *THE JOURNAL*; George W. Crile, Cleveland; Walter C. Alvarez, Rochester, Minn., and Frederick A. Coller, Ann Arbor, Mich. The registration fee, including luncheon, dinner, dance and two or three nights at the hotel, will be \$8.50; the fee is \$3.50 for those not staying at the hotel. At a meeting of the National Executive Committee of the Association of Medical Students, New York City, July 3-5, it was decided that chapter delegates to the national conventions shall be elected on the basis of one for every twenty paid-up members as of December 1. Each delegate shall be entitled to one vote.

Prizes to Encourage Writing

The University of Indiana School of Medicine, Indianapolis, announces that Mr. H. Osterman, of Seymour, Ind., has offered annual prizes for outstanding papers by students in the medical school. There will be three prizes of \$30, \$25 and \$25 for case reports; three prizes of the same amounts for statistical studies, and two prizes of \$25 and \$15 for outstanding papers. The judges for the selection of the winners comprise the editors of the *Bulletin of Indiana University Medical Center*: Drs. Jacob K. Berman, Willis D. Gatch, Robert L. Glass, Harold M. Trusler, Ernest Rupel, Edgar F. Kiser and Frederick W. Taylor.

One in Ten Applicants Accepted at Temple

The thirty-eighth session of Temple University School of Medicine, Philadelphia, opened September 20 with the following enrolment: freshmen, 110; sophomores, 98; juniors, 118; seniors, 119. The total of 445 includes 127 students enrolled for the first time. These students completed their premedical courses in sixty-seven colleges. The states represented are California, Connecticut, Delaware, Florida, Idaho, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Utah, Washington and West Virginia; Puerto Rico is also represented. There are seventy-two Pennsylvanians, twenty-three sons and daughters of physicians and also six women students. The freshman class was selected from a total of 1,196 applicants who submitted formal applications and credentials.

Student Opinion Surveys

For more than two years Student Opinion Surveys of America, with headquarters at the University of Texas, has been conducting research on public opinion among the college students of America. Personal interviews are used to gather opinions at regular intervals in colleges throughout the United States, and the ballots are then mailed to Austin, Texas, for national tabulation. This is the only such college poll, it is said, that uses personal interviews to gather opinions. In this way a cross section is established, and the opinions of the million and a half college students are measured accurately. The project is concerned only with disclosing facts about student sentiment and does not seek to influence public opinion. Pressure groups or student movements have no part in the surveys. Ballots are carefully distributed according to

geographic sections, sex, age, class in college, political affiliation, whether the student works or not, and type of school. Among college papers which will published these polls is *The Tiger*, Journal of Tulane University of Louisiana School of Medicine, where the personal interviews will be conducted by Malter Salatch, member of *The Tiger* staff, with Spurgeon M. Wingo editor of *The Tiger* acting as local director of the polls.

Fellowships at Washington University School of Medicine

Students at Washington University School of Medicine, St. Louis, in the upper three classes of the school who are deserving on the basis of need, scholarship and character may obtain loans granted by the chancellor on recommendation of the Committee on Loans and Scholarships and the dean. For example, under the will of the late Jackson Johnson, \$250,000 was donated to the university, the income from which is used to aid worthy and desirable students in acquiring a medical education. From this fund honor scholarships are provided to exceptional students who are applicants for the first year class, each scholarship carrying an annual stipend of at least \$300 and not more than \$1,000. The Eliza McMillan Student Aid Fund comprises the annual income from \$7,000, which may be awarded to a deserving woman student in the school of medicine. The T. Griswold Comstock scholarships comprise the annual income from \$12,000, which is used for two scholarships for students who otherwise would be unable to obtain a medical education. There is also the Alumni Scholarship Award of \$100 to be applied on payment of tuition fee, given for excellence in work during the preceding scholastic year. Application for all these awards and aids should be made to the dean of the medical school.

The Medical Son of an American Physician in Argentina

The son of an American doctor occupies a very high place in the memories of Argentine physicians. Dr. Aman Rawson, a United States Navy physician, on his third trip to South America decided to settle in the Plata region in 1818, the year when San Martin's victory at Maipu secured its independence from Spain. Dr. Rawson's son, Guillermo (William), was named after the Philadelphia colleague who had induced the father to go to Argentina. Guillermo Rawson was renowned not only as a physician but also as a statesman. It has been said that he was too valuable in politics to be allowed to be buried in his profession. Rawson's versatile personality and achievements have recently been sketched (Araoz Alfaro, G.: *Cronicas y Estampas del Pasado*, 1938; Un Vastago Norteamericano en la Republica Argentina: Guillermo Rawson, 1939). Memorials have been raised to him in Buenos Aires. He was the first professor of public health in Argentina and his classes were the most popular in the school. He submitted to the international congress in Philadelphia in 1876 the first study of the vital statistics of Buenos Aires. In 1854 he foresaw aerial navigation by machines heavier than air. Rawson, as a member of the cabinet, signed the contract for the first cross country railroad in Argentina (1864), drew the bill for the creation of a department of agriculture and put through congress the law on a national census. One of Rawson's most noted characteristics was his devotion to the country of his parents. No occasion was neglected by him to

bring American principles to the attention of Iris countrymen. One of his books deals with American politics. His standards were high; not even a bid to the presidency could make him change his stand. At his death a state funeral was decreed, and former President Mitre truly said that never had he known a man more closely approaching moral perfection.

Dr. Cannon Addresses North Dakota Students

Dr. Walter B. Cannon, Boston, gave three addresses to the students of the University of North Dakota School of Medicine, Grand Forks, October 11. His subjects were "Chemical Mediation of Nerve Impulses," "Maintenance of Bodily States" and "Effects of Strong Emotions." The lectures were arranged through the cooperation of the medical school, the Grand Forks District Medical Society and Sigma Xi.

Loans to Students at Medical College of Virginia

The Medical College of Virginia, Richmond, has certain funds from which limited amounts may be loaned to assist worthy medical students in the pursuit of their studies. Small amounts are available from the William Karp Memorial Loan Fund and the Lewis Z. Morris Memorial Fund. The Student Body Loan Fund was appropriated from unexpended balances from organized student activities for the purpose of making loans to students through a committee of the student body and the secretary-treasurer of the college. There is the Benjamin Hobson Frayser Loan Fund, the General Loan Fund and the State Loan Fund, the last derived from an appropriation by the state of Virginia of \$1,000 annually for loans to Virginia students of ability and character who are in financial need. The amount lent in any one session from the State Loan Fund to students of medicine is limited to \$137.50. Preference will be given to applicants who have completed the first year course.

Fees at the Medical College of Virginia

The tuition for medical students at the Medical College of Virginia, Richmond, is \$275 for Virginia students and \$400 for non-Virginians. There is a matriculation fee of \$10, as well as laboratory fees in the first and second years of \$15, a contingent deposit of \$20, student health service \$12, student activities \$12 and certain few other fees connected with graduation.

Senior medical students at this school, unless residents of Richmond or excused for special reasons, are required to live and board at Hunton Hall, in which the rate for the session, payable one half at the beginning of each semester, is \$150 for single rooms; \$130 per student for double rooms, with board at \$22 a month. The rate for board is subject to change without notice. Suitable board and room may be obtained in the city of Richmond from \$30 to \$35 a month.

After the first year in the school of medicine it is often possible for a student to find outside employment to help pay expenses. There are junior internships and other hospital positions, for example. Students are not encouraged to seek employment which requires any appreciable amount of time, as it frequently leads to failure in college work.

Student Organization at Western Reserve

The student body at Western Reserve University School of Medicine, Cleveland, has organized the Student Cooperative Association for the cooperative purchase of instruments, books and other supplies, from

which each member receives a pro rata dividend at the end of the school year. A member is charged a small membership fee. The association is under the control of a board of student directors.

Aid to Students at Western Reserve

Western Reserve University School of Medicine, Cleveland, has available certain funds from which limited loans to promising and needy students can be made. These funds are provided by the Medical Alumni Association, the Student Aid Fund and the Biggar estate. During the last school year, twenty-five students received fellowships, scholarships or loans. The medical school feels that it is impossible for medical students to undertake any other work during the school term without serious and perhaps fatal detriment to their medical studies. However, the school will endeavor to assist students to obtain suitable employment should this become absolutely necessary. In such cases the student should first consult the class adviser. The total necessary expenses at the school for thirty-four weeks, including books, instruments, board and room, but exclusive of tuition and fees, according to the *Western Reserve University Bulletin*, need not exceed \$800.

Loans for Women Students

A trust fund of \$5,000 was established years ago in the Woman's Medical College of Pennsylvania, Philadelphia, by Elizabeth H. Francis for the purpose of assisting needy students, for which loans interest is charged at such a rate as the committee may decide. These loans are secured by an endorsed note, a life insurance policy or such other security as shall be acceptable to the board of corporators. Repayment in instalments begin not later than three years from the date of graduation and must be completed within seven years from that date.

Other means of assisting students are available, including awards of scholarships and other loan funds.

Expenses of Woman's Medical College

The Bulletin of the Woman's Medical College of Pennsylvania, Philadelphia, estimates that the expenses for the first year in the medical school are as follows:

Matriculation fee.....	\$ 5.00
General tuition fee (admitting student to all lectures and laboratory courses belonging to the year)....	400.00
Library fee.....	2.00
Credential fee.....	2.00
Medical service fee (entitling student to x-ray examination of chest, which is required on admission, to advice at the daily student dispensary hour and to emergency care at her room by the student physician; it does not entitle the student to free care in the hospital).....	8.00
Materials fee.....	15.00
Breakage deposit.....	8.00
Locker charge.....	.50

Getting Acquainted at Tufts College

At Tufts College Medical School, Boston, there is, a unique method of achieving a desirable student-faculty relationship. Five of the faculty members and the dean, representing such diverse groups as the Committee on Admissions and the Alumni Council, constitute the Student Relations Committee, the chairman of which, Dr. Benjamin Spector, professor of anatomy, is the first member of the faculty to come in contact with the new class. During the first few weeks of the year Dr. Spector prefaces his lectures on anatomy with the introduction of some member of the faculty, who talks briefly to the new students. After a number of the faculty have in this fashion become known to the new students, the entire faculty holds a reception

for first year men and women. The Student Relations Committee assists at this reception by rotating the individual faculty members among the students from group to group while a buffet supper is served. Informality is the keynote. Following the supper, the president, the dean and others give brief words of greeting. This procedure has been employed for several years with much success.

Long Island College of Medicine

The Student Council at the Long Island College of Medicine, Brooklyn, is conducting a survey of the economic status of the students to determine what percentage of them must earn tuition, room and board, and how much assistance they receive from other sources. Bob Hughes is directing the study for the Student Council. Should the results of the survey warrant, the Student Council may suggest that an employment bureau be established at the college. Last summer the majority of the present senior class served junior internships; six members of the class, however, worked on a statistical project in venereal diseases being conducted by the U. S. Public Health Service. Each one of these six students, among other things, had to read many hundred of venereal disease case histories. The present freshman class at the college has ninety-nine members, graduates of forty-three colleges and universities. The school year opened September 25 with a formal ceremony in the amphitheater at Polhemus. At the last commencement the address was delivered by Dr. Charles Gordon, professor of clinical obstetrics and gynecology, and director of the teaching division of that department at the Kings County Hospital, Brooklyn.

History of Medicine for Freshmen

The series of lectures on medical history announced for the freshman class at Tulane University of Louisiana School of Medicine, New Orleans, was initiated October 4 by a lecture on the "History of Tulane" by the dean, Dr. C. C. Bass, and followed October 25 by a lecture on the "History of Anatomy" by Dr. B. Bernard Weinstein. Other lectures have been scheduled in this series as follows: "Development of Microscopic Anatomy," Harold Cummins, Ph.D., November 15; "History of Physiology," Hymen S. Mayerson, Ph.D., November 29; "History of Physiology," Dr. Mayerson, December 6; "Development of Biochemistry," Sidney B. Bliss, Ph.D., December 13: Dates are to be assigned for the following lectures: "History of Pathology," Dr. Charles W. Duval; "History of Parasitology," Ernest C. Faust, Ph.D.; "Landmarks in Medicine," Dr. John H. Musser; "The Instrumental Aids in Medicine," Dr. Roy H. Turner; "The Rise of Hospital and Public Health Service," Dr. William H. Perkins; "The Development of Psychiatry," Dr. Theodore A. Watters; "The Development of Pharmacology," Dr. Erwin E. Nelson; "Medical Bibliography and the Use of the Library," Mary L. Hutton.

Scholarships at Maryland

Among the scholarships available at the School of Medicine of the University of Maryland are the Dr. Samuel Leon Frank Scholarship (\$100)—no student may hold this scholarship for more than two years; the two Charles M. Hitchcock Scholarships (\$100 each); the Randolph Winslow Scholarship (\$100), awarded annually to a needy student of the senior, junior or sophomore class, who must have maintained an average grade of 85 per cent in all his work; the Dr. Leo Karlinsky Memorial Scholarship (\$125); the University Scholarship, which entitles the holder to exemption from payment of tuition fee for the year, awarded to a senior student in need of assistance;

the Frederica Gehrmann Scholarship (\$200), awarded to a third year student who has passed the best practical examinations in certain subjects; the five Clarence and Generva Warfield Scholarships (\$300 each), available to students of any of the classes, but a recipient must, after graduation and a year's internship, practice for two years in the county of Maryland to which the student is accredited or in a county selected by the medical council; the Israel and Cecilia E. Cohen Scholarship (\$150), a recipient being obliged after graduation and a year's internship to practice for two years in the county to which he is accredited; and the Dr. Horace Bruce Hetrick Scholarship (\$125) awarded by the Medical Council to a student of the senior class.

Personal Expenses at Maryland

Estimates of a student's personal expenses in Baltimore for the academic year of eight months at the School of Medicine of the University of Maryland have been prepared by students based on actual experience. The following estimates appear in the latest available bulletin of the school; there is in addition a certain expenditure for a microscope:

Items	Low	Average	Liberal
Books	\$ 50	\$ 75	\$100
College incidentals.....	20	20	20
Board, eight months.....	200	250	275
Room rent.....	64	80	100
Clothing and laundry.....	50	80	150
All other expenses.....	25	50	75
Total.....	\$409	\$556	\$720

Aid for Students at Nebraska

Scholarships are available in the various departments of the University of Nebraska College of Medicine, Omaha, in return for student assistance; applications should be made to the chairmen of the various departments. In addition, there is available the income from the Jetur Riggs Conkling and Jennie Hanscom Conkling Foundation, which is to be used in providing scholarship loans for deserving medical students, awarded only after the close of the first year in medical college, and the scholarship loans are not to exceed \$200 a year; the Omaha Medical College Foundation Fund of more than \$15,000, the income from which is available to worthy students. Students should make a written application for benefits under this fund to the dean of the medical school. The Nebraska Federation of Women's Clubs makes an annual grant of \$200 to a student in the college of medicine on the basis of scholarship and financial need.

Student Society at Pittsburgh

The Students' Medical Society of the University of Pittsburgh School of Medicine holds quarterly scientific meetings at the Pittsburgh Academy of Medicine, where papers written by medical students are read. The society also sponsors an annual reception for the freshman class, the medical school year book and a student loan fund.

Expenses at Nebraska

According to the *Bulletin of the University of Nebraska College of Medicine*, the expenses at this school are estimated in part as follows:

Board may be obtained in the vicinity of the college campus at an average of \$8 a week. Comfortable rooms for individuals cost from \$10 to \$15 a month. Students rooming together may obtain comfortable rooming quarters at approximately \$8 a month each. The average expense of the student for a school year, including books, instruments and all fees, is between \$700 and \$900. Students should provide an allowance of \$75 a year for books and instruments.

Loan Funds at University of Illinois

The University of Illinois College of Medicine, Chicago, has available a number of loan funds for the benefit of worthy students who are in need of financial aid in order to finish their courses at the school. Applicants should apply to the dean's office for detailed information.

Students having the following undergraduate scholarships at this school are exempt from matriculation and tuition fees but are required to pay all laboratory and dispensary fees:

General Assembly Scholarships—One nomination each year by each member of the general assembly. Nomination must be received by the president of the university not later than the first Monday in July.

State Military Scholarships—for World War Veterans. Special provisions were passed by the General Assembly in 1919. Address the registrar of the University of Illinois at Urbana for detailed information about these scholarships.

Additional scholarships include the following:

Four Rea scholarships. These are awarded each year by officers of the faculty for worthy students. These scholarships last year were granted to Henry S. Bernet, Glenn A. Hoss, Leland J. Mortenson and LeRoy E. Walter.

The Charles Spencer Williamson Memorial Scholarship. This is awarded annually to a capable and needy student either graduate or undergraduate, the award to be made by the dean and head of the department of medicine. Last year this scholarship was awarded to Harve W. Jourdan Jr.

The Theodore B. Schnitzer Memorial Scholarship. This scholarship of \$100 annually is available to a needy Jewish student who ranks in the upper half of his class and has completed at least one year in the college of medicine. This scholarship is awarded by a committee of the faculty and in 1938 was awarded to Milton Feinberg.

The late Dr. Frank Smithies endowed an annual prize in memory of William Beaumont, which is awarded by a committee to the student or faculty member who submits the best original work on diseases of the alimentary tract. In 1938 the twelfth award was made to Dr. Alexander J. Nedzel.

A \$100 prize is given every other year for the best contribution in the field of allergy by any student or member of the faculty of the college of medicine. This prize will be awarded in 1939.

The annual Sigma Xi prize of \$25 for the best scientific investigation by any student in the college of medicine, the college of dentistry or the graduate school was awarded last year to Milton Engel and Philip Wesoke for their paper entitled "A Cephalometric Appraisal of Congenital Hypothyroidism."

Georgia

A chapter of Alpha Omega Alpha, honorary medical society, has been installed at Emory University School of Medicine, Atlanta. Dr. Walter L. Bierring, Commissioner of Health of Iowa and national president of the fraternity, was present and conferred the charter of Beta chapter of Georgia. The student initiates who were chapter members were Frederick W. Cooper, Talbert Cooper, Cecil B. Elliott, John P. Gifford, John R. McCain and John H. Ridley.

Fees at Stanford University School of Medicine

The tuition fee for students in the school of medicine is \$115 a quarter. A deposit of \$20 is required of each applicant admitted to the entering class or to advanced standing in the school of medicine within ten days after receiving notice of his selection, this deposit being applied on the payment of his medical fees for the first quarter.

The community fee for all students, except those registered at San Francisco, is \$15 a quarter. This fee covers the privilege of the gymnasiums, athletic grounds, the Hospital Fund, the Stanford Union or Women's Clubhouse, the Memorial Hall Fund, and

membership in the Associated Students. All students registered in San Francisco are charged a student health fee of \$5 a quarter, a fee of \$1 for student athletic privileges and, during the winter quarter, a student body fee of \$1.

A general library fee of fifty cents a quarter is charged each undergraduate and graduate student registered in the university except students in the school of medicine in San Francisco and students registered in professional schools collecting their own library fees.

In addition, students are charged for the materials which they use. They also may be required by any department to make a deposit to cover breakage or loss of apparatus and materials, such deposits being returnable, less charge for breakage, loss or wear and tear of apparatus. The total deposits for this purpose may vary from \$10 to \$20 a quarter.

Drafts and checks should be drawn for the exact amount to the order of Stanford University School of Medicine, as no change can be returned to students on checks or drafts.

Aid to Students at Stanford

Among the scholarships, loan funds and fellowships available to medical students at Stanford University are the Florence Hecht Fries scholarship in medicine, the income from a fund of \$5,000 awarded annually to a needy student; the Carrie Hassler Scholarship, the income from a fund of \$6,300 awarded annually; the Agnes Walker Scholarship, the income from \$12,000 awarded annually to a woman medical student; the Alpha Omega Alpha Loan Fund administered by the dean of the school of medicine; the Alumni Jordan Medical Scholarship Loan Fund, for the purpose of paying the tuition fees of several medical students of high standing with the stipulation that at some future time the amount will be returned; the Dr. Robert Patek Memorial Loan Fund to assist medical students in completing their courses. The loans bear no interest until one year after graduation and then bear 6 per cent interest until paid; the Stanford Medical Alumni Revolving Loan Fund, restricted to medical students in San Francisco (loans are limited to \$50 at any one time); the Romaine Josephine Stanley Fund; the Dr. Phil H. Weber Fund for deserving students, the loans bearing 6 per cent interest annually until paid; the Women's Auxiliary of the Alameda County Medical Association Fund, lending \$100 to a third or fourth year student whose home is in Alameda County, and the Jane Darling Stevenson Memorial Fund, the loans being restricted to women medical students in the advanced classes. This particular fund is administered by the chairman of the National Committee of Alpha Epsilon Iota, Dr. Monica Donovan, suite 1839, 450 Sutter Street, San Francisco. Information concerning the other funds mentioned may be had from the dean, Stanford University School of Medicine, San Francisco.

Wisconsin State Board Questions

The following questions in roentgenology were given at the examination held in Milwaukee June 27-30, 1939, by the Wisconsin State Board of Medical Examiners:

1. What are the characteristics of a fracture line?
2. What are the x-ray characteristics of a pyogenic process?
3. What are the commonest x-ray characteristics of syphilis of the bone?
4. Does hyperpituitarism produce any bone changes?
5. How would you differentiate gallstones from kidney stones?

All questions were to be answered.

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ACUTE PERFORATION OF PEPTIC ULCER

IMMEDIATE AND LATE RESULTS IN
FIVE HUNDRED CASES

HAROLD LINCOLN THOMPSON, M.D., Ph.D.
LOS ANGELES

In the treatment of acute perforation of peptic ulcer neither the immediate nor the late results are wholly satisfactory. Immediate mortality is distressing and subsequent morbidity often embarrassing. Yet, considering the percentage of deaths when the condition is neglected, one is heartened by the fact that a majority of lives are saved by surgical treatment.

Immediate mortality in peptic ulcer complicated by acute perforation is dependent on many factors. The more important factors are not always under the control of the surgeon. Subsequent morbidity follows perforation largely because in most instances the risk to life is such as to prevent the surgeon's doing anything toward the cure of ulcer at the time of operation. Obviously if improvement in immediate and late results is to be obtained it must be accomplished through better control of the factors which affect morbidity and mortality. As surgeons, we must accept the challenge from the manifest need for improvement in end results.

LITERATURE

The literature on immediate results concerns itself chiefly with mortality and early symptomatic relief. The literature on late results revolves around the permanency of symptomatic relief and the further medical or surgical requirements of the patient. Published figures on mortality range all the way from 0 to 85.7 per cent, depending somewhat on the size of the series under discussion. For example, among Eliason and Ebeling's¹ collected cases there are seven reported series consisting of from six to twenty-two cases each in which there was no mortality. However, in eighteen series each consisting of 100 or more cases the mortality ranged from 12.9 to 38.8 per cent.

In 1908 Moynihan,² a pioneer in gastric surgery, reported a series of twenty-seven operations for perforation in which the mortality was 34 per cent. By 1928 his series had grown to 237 cases wherein the average mortality was 25 per cent. In Eliason and Ebeling's collected American series of 1,940 cases the mortality was 25.9 per cent, whereas in their European

series of 3,121 cases the mortality was 22.6 per cent. The average mortality in 5,061 collected cases, therefore, was 23.9 per cent.

Other factors which play a part in mortality are the interval between perforation and operation and the type of operation performed. Storey³ in 1936 reviewed a series of 261 cases in which the mortality ranged from 6.1 to 85.7 per cent, depending on the interval between perforation and operation. In a similar report by McCreery⁴ in 1938 the mortality ranged from 4.3 to 80 per cent.

In 1924 Bundschuh⁵ reported a small series of cases wherein mortality following conservative surgical treatment was 62.5 per cent whereas following radical pyloric resection it was only 16.6 per cent. Yudin⁶ in 1937 reported 331 Billroth I and Polya pyloric resections with the remarkably low mortality of 7.8 per cent. In 1937 Shawan⁷ reviewed 356 cases from the Detroit Receiving Hospital wherein the mortality ranged from 9.5 to 50 per cent with active treatment, depending on the type of operation employed.

Lewisohn⁸ in 1928 reported failure to cure in 39 per cent of cases, and in 1929 Olson and Cable⁹ found persistent symptoms in 10 to 67 per cent of cases, depending on the type of operation performed.

In 1932, Shelley¹⁰ reported follow-up analysis of fifty-nine cases traced for from one to five years and found 67 per cent cures.

PRESENT SERIES OF CASES

This report is based on an analysis of 500 cases of acute perforation of peptic ulcer collected from the charity services of Los Angeles hospitals between Sept. 9, 1921, and June 30, 1934. Except for 1.8 per cent of cases in which the clinical diagnosis was correct beyond doubt, all the perforations were proved by operation or autopsy. This requirement of proof automatically excluded many cases in which the condition was clinically diagnosed and medically treated, especially those in which recovery took place. The mortality figures are affected accordingly.

Operations were performed by fifty-seven surgeons, with an average of 8.7 cases each. Such factors as site of perforation,¹¹ causes of death¹² and other clinical features¹³ of the present series of cases are reported elsewhere.

3. Storey, J. C.: *M. J. Australia* 1: 52-59 (Jan 11) 1936.

4. McCreery, J. A.: *Ann. Surg.* 107: 350-358 (March) 1938.

5. Bundschuh: *Arch. f. klin. Chir.* 129: 281-296, 1924.

6. Yudin, S. S.: *Surg., Gynec. & Obst.* 64: 63-68 (Jan.) 1937.

7. Shawan, H. K.: *J. Michigan M. Soc.* 36: 629-632 (Sept.) 1937.

8. Lewisohn, Richard: *Ann. Surg.* 87: 855-860 (June) 1928.

9. Olson, F. A., and Cable, M. L.: *Minn. Med.* 12: 468-478 (Aug.) 1929.

10. Shelley, H. J.: *Am. J. Surg.* 15: 277-303 (Feb.) 1932.

11. Thompson, H. L.: *Surg., Gynec. & Obst.* 64: 863-871 (May) 1937.

12. Thompson, H. L.: *Proc. Second Cong. Pan-Pacific S. A.*, 1936, pp. 25-32.

13. Thompson, H. L.: *California & West. Med.* 44: 469-474 (June) 1936.

Read before the Section on Surgery, General and Abdominal, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Eliason, E. L., and Ebeling, W. W.: *Am. J. Surg.* 24: 63-82 (April) 1934.

2. Moynihan, B. G. A.: *Brit. M. J.* 1: 1092-1096, 1908; *Practitioner* 120: 137-174 (March) 1928.

IMMEDIATE RESULTS

Clinical Results.—According to the hospital records 206, or 41.2 per cent, of the patients were followed for periods ranging from a few weeks up to eighteen months (fig. 1). Among them 125, or 60.6 per cent, obtained complete relief after operation, whereas sixty-five, or 31.5 per cent, required medical treatment and sixteen, or 7.7 per cent, required further surgical treatment, as

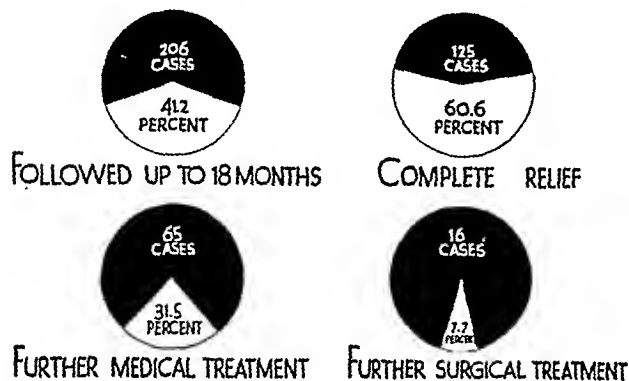


Fig. 1.—Immediate clinical results.

shown in the accompanying table. In seven cases, or 3.3 per cent, reoperation of peptic ulcer occurred, whereas in twelve, or 5.8 per cent, massive hemorrhage took place.

Of the cases in which further surgical treatment was required, gastrojejunostomy for obstruction was performed in eight, simple closure of reoperation and pylorotomy each were performed in two, whereas exploration, jejunostomy, pyloroplasty and sleeve resection were performed in one case each.

Gastrojejunal ulcer occurred in two of the cases in which gastrojejunostomy had been performed.

Gross Mortality.—Gross mortality, the mortality irrespective of the type, promptness or lack of treatment, includes the entire group of 500 cases (fig. 2). In this series 197 patients died, representing a gross mortality of 39.4 per cent. In 60.6 per cent of cases recovery took place.

Type of Treatment.—In seventy-six cases nonsurgical or expectant treatment was used (fig. 3). In this group there was only one recovery, which represents a mortality of 98.6 per cent. In 424 cases surgical treatment was used, with a mortality of 28.7 per cent. It is to be noted that between the two types of treatment the spread in mortality amounts to 70 per cent.

Interval.—The interval between perforation and operation long has been known as one of the most important factors which concern mortality and one which it is possible for the surgeon to control in only a portion of the cases. Generally it is taught that the mortality is directly proportional to the interval. That this is not always the case is shown by this study (fig. 4).

The cases are divided into four groups. In the first group the perforation had existed six hours or less; in the second, for seven to twelve hours; in the third, thirteen to twenty-four hours, and in the fourth, twenty-four hours or more. The first two groups comprise 130 and 168 cases, respectively. It is of interest to note that the figures for mortality in these two groups are within 0.5 per cent of each other, being 21.5 and 22 per cent, respectively.

Comparing the third group with the second, one finds a sharp rise in mortality to more than double when operation is delayed until the second twelve hour period. On the other hand, in the fourth group there is a reduction of mortality by 12 per cent among those whose operation was delayed for twenty-four hours or more. In view of the extremely high mortality in patients treated expectantly, I am sure no one would wait until the first twenty-four hours had elapsed to perform operation, other things being equal.

The most important point is that the lowest mortality occurs when operation is performed within the six hour period. However, it may be that sometimes operation had better be deferred, just as is the case in appendicitis.

Surgical Procedure.—The type of surgical procedure has a direct bearing on mortality (fig. 5). In 148 cases

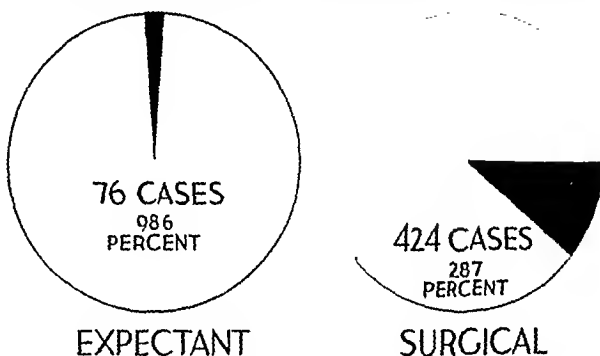


Fig. 3.—Relation of treatment to mortality.

wherein simple closure, that is, without suture of a tag of omentum over the perforation, was employed, the mortality was 34.4 per cent. In this connection it is

The Type of Operation Employed and the Complications Which Required Early Secondary Surgical Procedure in Sixteen Cases

Operation	No. of Cases	Complications	No. of Cases
Gastrojejunostomy	8	Hemorrhage	12
Simple suture	2	Obstruction	8
Pylorotomy	2	Reoperation	2
Pyloroplasty	1	Gastrojejunal ulcer	2
Jejunostomy	1		
Sleeve resection	1		
Exploration only	1		

highly important to note that in 242 cases wherein a tag of omentum was sutured over the perforation, the mortality fell off 10 per cent.

In thirteen selected cases wherein some procedure was added to closure, such as gastrojejunostomy or pyloroplasty, there were not any deaths. Two things should be taken into account with regard to this group: first, that the series is small, and second, that the patients were selected for their good general condition before the additional procedure was begun.

Drainage.—As is well known, the recent tendency is in the direction of employment of less and less drainage in acute perforation of peptic ulcer, except perhaps when purulent peritonitis is present. In a small group of fifty-seven cases wherein drainage was not employed, the mortality was 14 per cent (fig. 6). In seventy-one cases wherein a single drain to the site of the ulcer was used, the mortality was 19.7 per cent. In seventy-five cases wherein a single drain elsewhere was used, the mortality was 32 per cent. In 208 cases drainage of multiple areas was attended by a mortality of 34.4 per cent. It seems fair to point out that in the cases wherein drainage was not employed, the general condition of the patients doubtless was better and the risk of operation less than in the others, particularly those in whom multiple areas were drained.

Anesthesia.—In this series of cases only four types of anesthesia were used, namely, ether (in some instances gas followed by ether), nitrous oxide alone, and spinal and local infiltration of procaine hydrochloride (fig. 7). In the first group there were 239 cases

gastrointestinal trouble was not made on his clinical or autopsy records. The other patient was readmitted to the hospital a few months after operation with a diagnosis of senile psychosis, for which he was committed to a mental institution, from which he was reported to have died some months later.

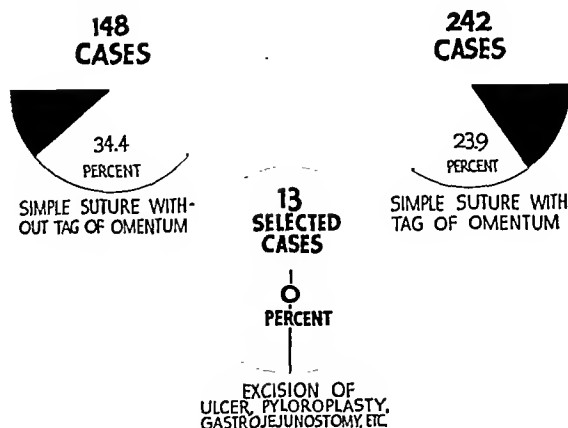


Fig. 5.—Relation of surgical procedure to mortality.

Relief.—When it was asked if complete relief was obtained after operation the affirmative was reported in nineteen cases, or 38.7 per cent, whereas incomplete relief was secured in 61.2 per cent. However, it was stated that symptoms had not persisted or recurred in only twelve cases, or 24.4 per cent. Correlation between this opinion on the part of the patient and his report of persisting symptoms was not possible from the nature of these reports.

Subsequent Treatment.—Some type of subsequent therapeutic care was required in all but twelve cases. Self medication was sufficient in twenty, or 40.8 per cent, but the care of a physician was necessary in fifteen, or

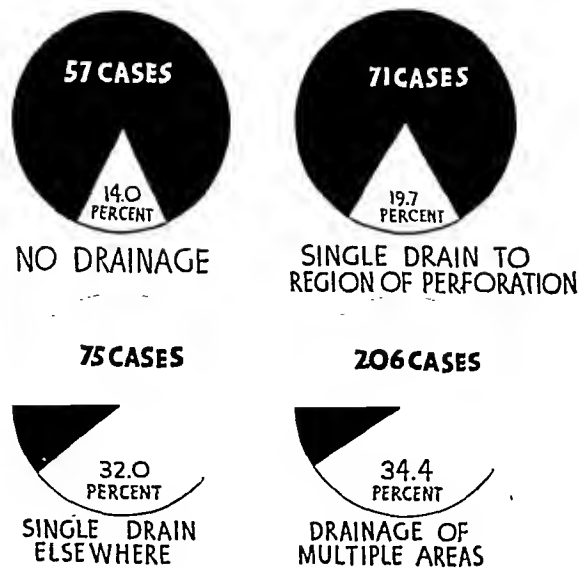


Fig. 6.—Relation of drainage to mortality.

30.6 per cent. Only two patients had had further surgical treatment. One had had a gastrojejunostomy for obstruction. The other had been symptom free for ten years when hemorrhage occurred for which gastrojejunostomy subsequently was performed. However,

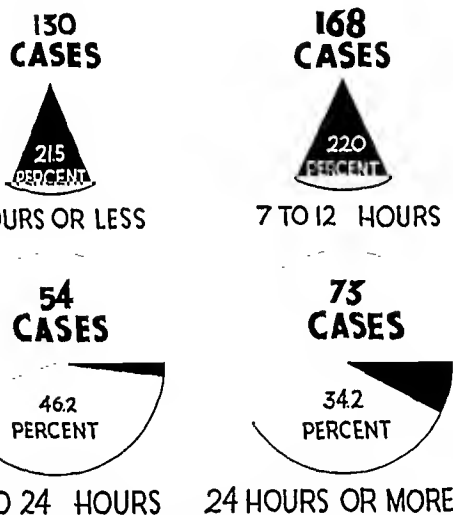


Fig. 4.—Relation of the interval between perforation and operation to mortality.

in which spinal anesthesia was used with sixty-five deaths, representing a mortality of 27.1 per cent. In the second group there were 145 cases in which ether was used with forty-one deaths, or a mortality of 28.5 per cent. In this group of eighteen cases in which nitrous oxide only was used the mortality was over 10 per cent higher, with seven deaths and 38.8 per cent mortality. In the group of seven cases in which local anesthesia alone was used there were six deaths, or a mortality of 90.7 per cent.

LATE RESULTS

Owing to the shift in population among persons who make up this series of cases late follow-up study was possible in only 10 per cent. However a group of fifty-one cases allows some interesting deductions (fig. 8). The time they were followed varied from three to fifteen years. It was five years or over in thirty-four cases, or 66 per cent; four years in thirteen cases, and three years in four cases.

Deaths.—Deaths were reported in two, or 3.9 per cent, of followed cases. One patient died in the same hospital fifteen years later, at which time mention of

further surgical procedure was advised in two more cases; in one it was declined and in the other deferred because of arterial hypertension.

Disability.—Inability to work since operation was experienced in twenty-one cases, or 42.8 per cent. Disability was not experienced in twenty-eight, or 57.1 per cent.

COMMENT

The gross mortality reported in the present study in comparison with that of other reported series of cases is relatively high. This is partially explained by the fact that in over 98 per cent of cases the diagnosis of acute perforation was proved by operation or autopsy. Unless some such criterion of proof is estab-

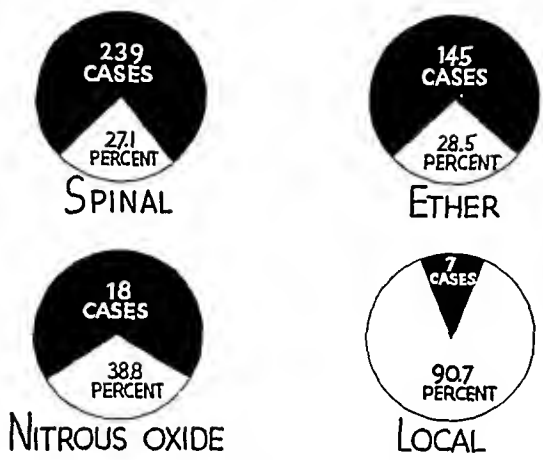


Fig. 7.—Relation of anesthesia to mortality.

lished the inclusion of any considerable number of clinically diagnosed cases in a study of this subject will unavoidably admit cases of appendicitis, pancreatitis and cholecystitis. The results will be modified accordingly.

For the same reason the mortality in the group of patients treated expectantly is extremely high. It is fair to point out that most of the patients in this group were moribund or beyond surgical aid when first seen. None of the patients in this group were treated by the continuous siphonage method. In the group treated surgically, on the other hand, the mortality compares favorably with that of other American series.

Regarding mortality with respect to anesthesia, it should be noted that in most of the cases wherein local infiltration of procaine hydrochloride was used the condition of the patient was so poor as to make the use of other methods of anesthesia objectionable. Spinal anesthesia was the most recent addition to anesthetic procedures, and it is quite possible that the patients in this group benefited also from other recent improvements in the handling of acute perforation of peptic ulcer.

While the group of cases on which the study of late results is based is not large, it represents the most important aspect of this study.

CONCLUSIONS

From this analysis of immediate and late results of treatment in acute perforation of peptic ulcer several conclusions may be drawn:

1. The gross mortality in cases of proved acute perforation of peptic ulcer is approximately 40 per cent.
2. Mortality may be materially lowered by the application of surgical treatment.

3. Mortality is lowest when operation is performed within six hours after perforation, when spinal anesthesia is used, when the operation consists of suture of a tag of omentum over the closed perforation and when drainage is not employed.

4. In approximately 40 per cent of cases continuation or resumption of treatment is required within five years, and in 10 per cent the treatment will be surgical.

1930 Wilshire Boulevard.

ABSTRACT OF DISCUSSION

DR. DAN C. DONALD, Birmingham, Ala.: Prompt surgery in acute perforated peptic ulcer stands out in the lead of all other factors governing the mortality rate. Among the surgical procedures, simple closure of the perforated ulcer by multiple interrupted sutures incorporating the omental tag is favored by the majority of statistics, with a death rate measured chiefly by the time interval (inception of perforation until patient reaches surgery). For late results, 39 per cent of the patients with perforated peptic ulcer following simple closure continue to have ulcer symptoms, and a small percentage of the ulcers will reoperate. In consideration of late symptoms and complications of reoperation, I feel that simple closure might be altered by pyloroplasty in the duodenal and pyloric ulcer, provided the duodenum is mobile and peritonitis is not present. Through pyloroplasty I have lowered the digestive complaints to 10 per cent and the mortality rate to as low as or lower than that following simple closure. Ninety per cent of perforated peptic ulcers occur near the pylorus, and the duodenal ulcer is ten to one greater than the gastric ulcer, and rarely is it more than 2 cm. from the pylorus. In pyloroplasty the ulcer-bearing tissue is excised in an elliptic manner along the course of the bowel, incision is carried through the pyloric ring on to the stomach for 4 cm. more and the opening is closed in transversely. The advantages from this type of operation are: the ulcer is removed, pyloric spasm is overcome and the opening between the stomach and the duodenum is enlarged, permitting a reflux of the alkaline secretions from the intestinal juices to aid in minimizing the acid chyme of the stomach. The keynote of success resulting from surgery in cases of perforated ulcer of the duodenum is to permit the stomach to drain by duodenal route rather than by gastro-

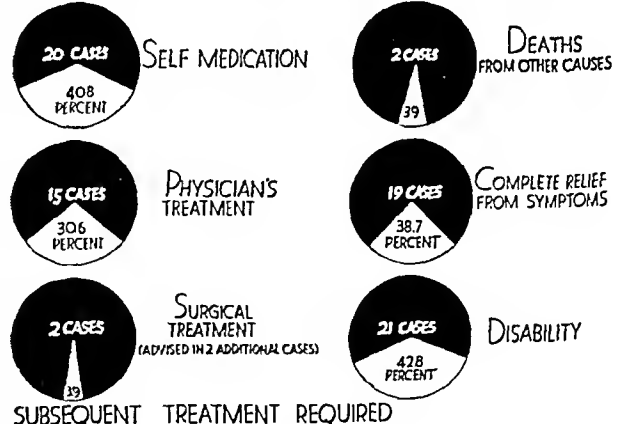


Fig. 8.—Late results in fifty-one cases followed from three to fifteen years.

jejunostomy, wherein the gastric content with a high hydrochloric acid unit is permitted to flow into the jejunum, which is often followed by a marginal ulcer. Only in definite obstruction of the duodenal type of perforated ulcer should gastrojejunostomy be considered; such perforations are rare in this entity. In all acute attacks the perforated gastric ulcer should be excised by simple closure with interrupted sutures incorporating the omental tag.

DR. J. WILLIAM THOMPSON, St. Louis: We have made a clinical study of the results in the surgical treatment of perforated peptic ulcers at the St. Louis City Hospital. Our

series of 152 cases compares in many ways with that from the Los Angeles County Hospital. The diagnosis of perforated peptic ulcer is usually not difficult. Occasionally an acutely perforated ulcer is confused with acute appendicitis. We take roentgenograms of the chest and abdomen as a routine in order to reveal the presence of air under the right leaf of the diaphragm. I believe that this is a most important procedure and should be used a great deal more frequently, especially in making a differential diagnosis in doubtful cases. Our investigations show no seasonal variation in the incidence of perforation. The mortality rate in perforated ulcer goes up tremendously in patients past the age of 60. Therefore it is important to consider surgical treatment of peptic ulcers in patients past middle age. Peptic ulcer is an extremely common disease, and familiarity should not breed contempt leading to overprolonged medical treatment. Ulcers on the gastric side of the pyloric sphincter are frequently malignant, no matter what size, and therefore should be operated on when there is the slightest doubt as to the exact nature of the lesion. In this way a few patients will be prevented from dying from complications of perforation. The procedures used in our series are essentially the same. Most of them were simple closures, and the results are better in those cases in which this method was used. The mortality rate was 25 per cent, a little lower than that of Dr. H. L. Thompson. A policy of doing more extensive operations such as pyloroplasty and gastro-enterostomy, I think, should be frowned on. In an exceptional case they are occasionally justifiable.

DR. CHARLES BROWN ODOM, New Orleans: Dr. DeBakey has reviewed 211 cases admitted to Charity Hospital in New Orleans during the last ten years. It has been recognized that the incidence of peptic ulcer is increasing. However, the frequency of acute perforation is becoming disproportionately greater. Although the percentage of ulcers per hundred thousand admissions increased from 0.0444 in 1929 to 0.0614 in 1938, comparable figures for acute perforations were 0.0139 and 0.0782. Contrary to the general impression that perforated ulcer occurs rarely in Negroes, race incidence in our series revealed almost equal frequency: 128 (60.6 per cent) white and 83 (39.3 per cent) Negro patients. Basing these respective incidences on corresponding hundred thousand admissions, these figures are: 0.0403 and 0.0364 per cent. There was no significant seasonal variation in our cases. A review of more than 15,000 cases reported in the literature revealed variations too wide to be significant. Mortality incidence in this series was found to depend on several factors, one of the most important being the number of hours after the perforation. All cases that were not proved perforations were disregarded. In eighty-two cases operation was performed within six hours with nine deaths, a mortality of 10.9 per cent; sixty-six cases within twelve hours with ten deaths, a 15.1 per cent mortality; nineteen cases within eighteen hours with five deaths, a higher mortality. After twenty-four hours there were nine deaths in nineteen cases, or 47.3 per cent. I don't believe one can treat perforated peptic ulcer any other way than by surgery. I think that Dr. Thompson's figure after the twenty-four hour period is misleading. The type of operation was another factor in the mortality rate; in 200 cases treatment was by simple closure with thirty-three deaths. With other operative procedures the mortality rate immediately increased. In seven cases in which other procedures were used three deaths occurred. The anesthetic was another factor in mortality. I believe that block anesthesia is the best anesthesia to use in these cases. Whereas of seven cases in which epidural block and 154 cases in which spinal anesthesia were used, the mortality incidences were 0 and 15.7 per cent respectively; of forty-three cases in which general anesthesia and five cases in which local analgesia were employed, the respective death rates were 22.7 per cent and 60 per cent.

DR. HAROLD LINCOLN THOMPSON, Los Angeles: The etiology, pathology and diagnosis in this group of cases have been studied statistically and are reported elsewhere. I believe that one can approach the truth in this condition only when a large series of cases is considered. I know of no other way to smooth out the marked variations that are found in reports on smaller groups of cases. I hope to make a report on a

more recent series of 500 cases in the near future. I should like to call attention again to the fact that these were proved perforations. This authentication is the only means by which to approach accuracy in a study of this kind. Regarding spinal anesthesia, it is possible, since the spinal method is the most recent addition to our methods of anesthesia, that the patients in this group also benefited by other recent technical improvements in treatment.

NEUROLOGIC ASPECTS OF HERNIATED NUCLEUS PULPOSUS

AT THE FOURTH AND FIFTH LUMBAR INTERSPACES

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As recently as a year ago it was considered imperative to confirm any presumptive diagnosis of herniated nucleus pulposus of the lower lumbar intervertebral disks by roentgenologic examination of the spinal canal after injection of some contrast medium.¹ However, even a year ago in cases of severe, persistent sciatic pain associated with pain low in the back and rigidity, together with hypesthesia of the lateral aspect of the involved leg and diminution of the ankle jerk, surgical exploration gave positive results regardless of the type of defect demonstrated with iodized oil. Conversely, all too frequently in cases of what were thought to be characteristic defects demonstrable with iodized oil but in which the neurologic evidence was less characteristic, exploration gave negative results. On the basis of our experience with a series of eighty-five low intraspinal lesions treated surgically we shall present what we have found to be the characteristic clinical picture of herniated nucleus pulposus at the fourth and fifth lumbar interspaces.

The term "herniated nucleus pulposus" is used in preference to "protruded intervertebral disk" because disease of the disk is rarely responsible for nerve root compression except when the annulus fibrosus has ruptured and allowed the nucleus pulposus to extrude through the defect.

It must be emphasized in the beginning that the history and neurologic signs of herniated nucleus pulposus are not peculiar to this one clinicopathologic entity. Neoplasm along the course of the sciatic nerve, rectal or pelvic disease and disease of the osseous structures must be ruled out by regional and roentgenologic examinations before the clinical diagnosis of herniated nucleus pulposus can be made.

ANATOMIC CONSIDERATIONS

It is necessary to review the structure and innervation of the lower lumbar region to obtain a better understanding of the symptoms and signs of herniated nucleus pulposus. The relations between the fifth lumbar nerve and the disk between the fourth and fifth lumbar vertebrae and between the first sacral nerve and the lumbosacral disk are especially important, since in more

From the Department of Surgery, University of Louisville School of Medicine.

Read before the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Love, J. G., and Walsh, Maurice: Protruded Intervertebral Disks: Report of 100 Cases in Which Operation Was Performed, J. A. M. A. 111: 396 (July 30) 1938. Spurling, R. Glen, and Bradford, F. Keith: Low Intraspinal Lesions as a Cause of Back and Sciatic Pain, J. Med. 19: 598 (Feb.) 1939. Bell, J. C., and Spurling, R. Glen: Concerning the Diagnosis of Lesions in the Lower Spinal Canal, Radiology 31: 473 (Oct.) 1938.

than 90 per cent of the cases herniated nucleus pulposus occurs at these levels.

The spinal cord usually terminates opposite the intervertebral disk below the first lumbar vertebra. The nerve roots forming the cauda equina are freely movable in the large lumbar canal except as they approach their exits, where they are fixed. It is therefore apparent that displacement of the roots is possible, except near the port of exit, without neurologic deficit.

At the intervertebral disk between the fourth and fifth lumbar vertebrae (hereafter the fourth lumbar disk) the fifth lumbar nerve is contained in the subarachnoid space, fixed laterally against the dura one vertebra higher than its exit. The dural sleeve of the fifth lumbar nerve emerges below the fourth lumbar disk and passes downward beneath the pedicle of the fifth lumbar vertebra to its intervertebral foramen. This relation holds between all the lumbar nerves and their respective disks. In contrast, the dural sleeve of the first sacral nerve separates from the thecal sac above the lumbosacral disk and can thus be compressed without deforming the sac.

It is unnecessary to repeat the description of the intervertebral disk, so well presented by Mauric.² However, the innervation of the annulus fibrosus and the posterior longitudinal ligament which reinforces it has received scant attention.

Each of the spinal nerves gives rise to a recurrent branch just distal to the posterior root ganglion, which reenters the intervertebral foramen and supplies the ligamentous structures two vertebrae lower than the exit of the spinal nerve (fig. 1). Roofe's³ recent studies indicate that there is a profuse supply of sensory nerve endings in the annulus fibrosus and the posterior longitudinal ligament. This anatomic observation sheds much light on the symptoms both in cases in which the disease is limited to the ligamentous structures of the lower lumbar and lumbosacral regions

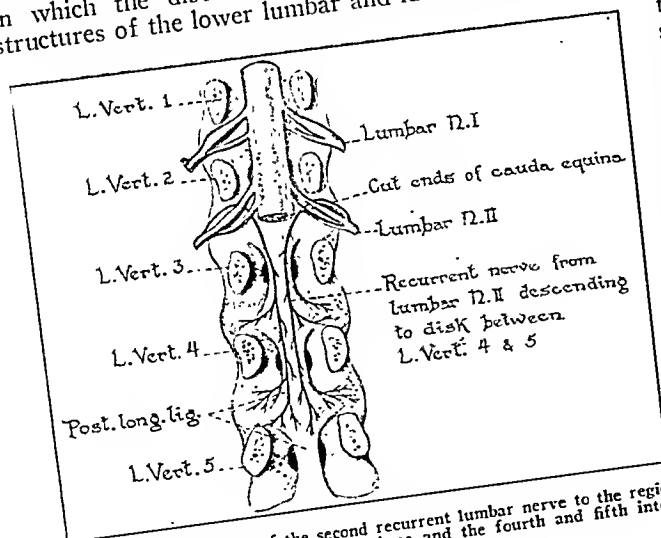


Fig. 1.—Distribution of the second recurrent lumbar nerve to the region of the third and fourth lumbar vertebrae and the fourth and fifth intervertebral disks.

and in cases in which a tear of the annulus fibrosus has led to herniation of the nucleus pulposus.

It is apparent from the relations indicated that knowledge of the exact distribution of the fifth lumbar and first and second sacral nerves, motor and sensory, is essential to a proper clinical understanding (figs. 2, 3, 4). In herniated nucleus pulposus the usual finding of hypesthesia or anesthesia of the lateral aspect

of the leg probably depends on the combined involvement of the dermatomes of the fifth lumbar and first sacral or the first and second sacral nerves, since the involvement of a single spinal nerve rarely gives objective sensory evidence. However, paresthesias may result from the involvement of a single spinal nerve. The dermatome of the fifth lumbar nerve is small, but its loss, with associated loss of the first sacral nerve, would probably give an area of hypesthesia on the anterolateral aspect of the leg. Similarly, both the first and the second sacral nerves would necessarily be affected if hypesthesia or anesthesia of the more lateral aspect of the leg was produced. The small gluteal dermatomes are rarely of clinical importance.

CLINICAL CONSIDERATIONS

Symptoms.—Discussion of the symptoms will be limited to those resulting from herniation of the nucleus pulposus at the fourth lumbar and lumbosacral disks.

The occurrence of severe, persistent sciatic pain is of greatest importance diagnostically, especially if it is exaggerated by coughing, sneezing or straining. The pain may not be uniform along the course of the nerve. Points of greatest intensity are likely to be in the gluteal region, the posterior aspect of the thigh, the back of the knee or the lateral aspect of the leg or ankle. Coughing, straining or sneezing may exaggerate the pain in only one place and may do so only transiently. In almost every case, however, incapacitating pain low in the back precedes the sciatic pain by weeks, months or years. In the absence of a definite history of trauma, the onset of acute pain in the back is usually associated with lifting in a bent forward position or with sudden torsion of the trunk. Frequently the pain at the time of injury is slight, becoming severe after several hours or days. The pain low in the back is variable or intermittent and is usually intensified by bending or lifting. Whether unilateral or bilateral, the main feature is its mechanical nature, its elicitation or aggravation by certain postures or movements. Additional trauma may precede extension of the pain along the course of the sciatic nerve. At this time the back pain may be an insignificant part of the clinical picture although usually present to a considerable degree.

Paresthesias are of extreme importance, being of far more localizing value than is the distribution of pain. Tingling, prickling, cold or numb sensations occurring below the knee in the lateral aspect of the leg or in the foot are characteristic of herniated nucleus pulposus at the fourth or fifth lumbar interspace.

Weakness is not usually a major complaint, being confused with the disability from pain unless a parietal palsy is present, such as foot drop.

Signs.—The stiff lumbar spine is a prominent clinical feature, but not as important diagnostically as the severe sciatic pain with a positive Lasègue sign, the hypesthesia of the foot and lateral aspect of the leg and the diminution or absence of the ankle jerk.

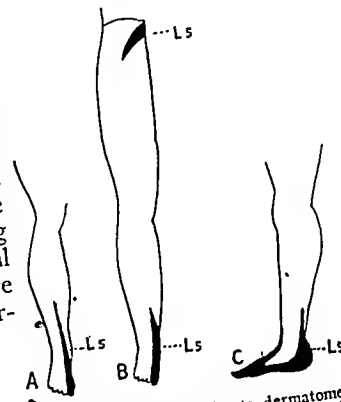


Fig. 2.—Approximate dermatome of the fifth lumbar root: A, ventral view; B, dorsal view; C, lateral view. (Figures 2, 3 and 4 are modified from illustrations in Tilney, Frederick, and Riley, H. A.: The Form and Functions of the Central Nervous System, New York, Paul B. Hoeber, Inc., 1938.)

2. Mauric, G.: Le disque intervertébral, Paris Thesis, 1933.
3. Roofe, Paul G.: Unpublished observations.

Patients with herniated nucleus pulposus at the fourth or fifth lumbar disk exhibit much the same appearance of the lumbar spine as patients with other severe articular disease of this region. This part of the spine is usually straight, with spasm of the erector spinae muscles, especially on bending forward. Listing to one side is common, with the ilium usually higher on the affected side. Limitation of flexion of the lumbar spine is marked in all patients in whom pain in the back is conspicuous and present to some degree in the remainder.

As Lasègue⁴ pointed out, many patients with severe sciatic pain keep the knee flexed and are unwilling to put the heel to the floor, thus preventing direct tension on the sciatic nerve. The test that bears his name accurately differentiates the patients with painful hamstring muscles from those with lesions affecting the components of the sciatic nerve. It is performed with the patient supine. The thigh is raised to right angles with the trunk, and the leg, which has remained flexed, is extended on the thigh until pain begins along the course of the sciatic nerve. Without further movement of the leg or thigh, the foot is passively dorsiflexed to determine whether this additional pull on the sciatic nerve exaggerates the pain. The results are positive in all cases of lateral herniation of the nucleus pulposus.

Occasionally, pressure directly or laterally on the spinous processes of the fourth and fifth lumbar vertebrae or pressure just lateral to the spines over the lumbar muscles will elicit pain in the distribution of the sciatic nerve. If present, this sign is highly indicative of herniated nucleus pulposus.

In a moderate percentage of patients with pain on coughing or sneezing, sustained pressure over both internal jugular veins reproduces or exaggerates the sciatic pain. This, a positive Naffziger⁵ reaction, is pathognomonic of intraspinal disease.

Tests of the motor power are usually not of much aid. Patients confuse pain on using the affected part with weakness, and testing is unsatisfactory because of the pain on exertion of motor power. However, occasionally definite paresis or paralysis of the anterior tibial, peroneal, extensor hallucis or extensor digitorum

the leg will be hypesthetic in most cases. However, herniation at the fourth lumbar disk (involvement of the fifth lumbar and first sacral nerves) usually results in hypesthesia of the anterolateral aspect of the leg with inclusion of the great toe (figs. 2 and 3), while herniation at the lumbosacral disk (involvement of the first and second sacral nerves) gives hypesthesia of the

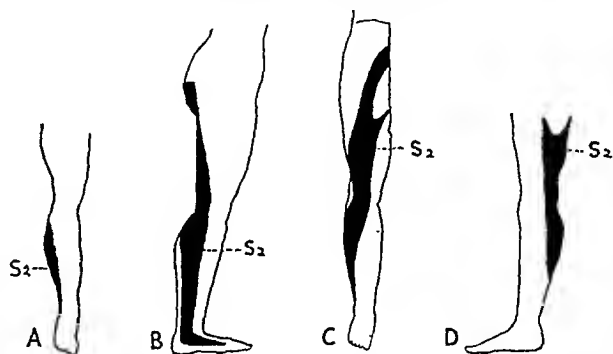


Fig. 4.—Approximate dermatome of the second sacral root. A, ventral view; B, lateral view; C, dorsal view; D, mesial view.

posterolateral aspect of the leg with inclusion of the lateral aspect of the foot (figs. 3 and 4). Sensory changes may also extend to the posterior aspect of the thigh and the saddle region on one side, but, as a rule, no diminution is observed above the knee. Although the areas of hypesthesia can usually be determined with pinprick, testing with cotton wool or hot and cold test tubes frequently reveals a definite area of hypesthesia where results with pinprick were equivocal. Stimulation of the hypesthetic zone may produce typical causalgic pain, limited to the area involved. The causalgia may overshadow the hypesthesia.

Patients with herniation of the nucleus pulposus at the fourth lumbar and the lumbosacral disk have in common pain low in the back, severe sciatic pain, and hypesthesia or anesthesia below the knee. If the ankle jerk is unchanged and paresthesia or hypesthesia in the leg is more anterior, including the great toe, the fourth lumbar disk is more likely involved. If the ankle jerk is diminished or absent and the hypesthesia is more posterolateral, including the lateral aspect of the foot, the herniation is probably at the lumbosacral disk.

COMMENT

The recurrent episodes of pain low in the back which usually precede the sciatic pain of herniated nucleus pulposus are due to disease of the intervertebral disks and posterior longitudinal ligament. Tearing of these structures may result from frank trauma or as a result of "wear and tear" on already degenerated structures. The annulus fibrosus and posterior longitudinal ligament are innervated by the recurrent branches of the lumbar nerves. Pain predominates locally with perhaps some spread to the gluteal regions or upper posterior aspect of the thighs. But true sciatic pain is not caused by involvement of the ligamentous structures alone. Many patients with ligamentous injuries probably recover without herniated nucleus pulposus developing beneath the nerve roots. It must be remembered that if the nucleus pulposus extrudes through the annulus fibrosus without causing nerve compression the lesion remains in the category of purely ligamentous injury.

However, in patients with disease of the annulus fibrosus, herniation is likely to occur in a posterolateral direction because of the poor lateral development of the posterior longitudinal ligament which reinforces the

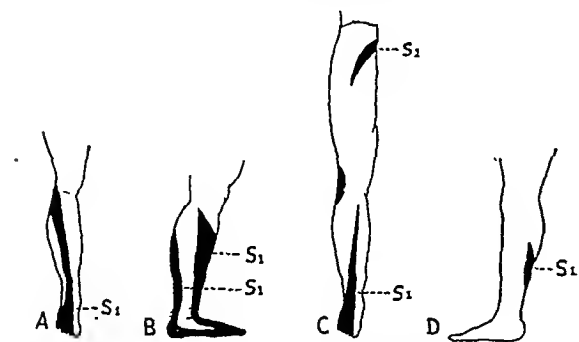


Fig. 3.—Approximate dermatome of the first sacral root: A, ventral view; B, lateral view; C, dorsal view; D, mesial view.

communis muscles is seen. Fibrillation of muscles of the leg is also seen in some cases. Much more important is diminution or absence of the ankle jerk, which usually occurs with herniation at the lumbosacral disk.

The sensory changes are most important in making the diagnosis. Whether the herniation is at the fourth lumbar or the lumbosacral disk, the lateral aspect of

4. Lasègue, Ernst-Charles: Consideration sur la sciatique, *Arch. gén. de méd.*, 2: 558, 1864.

5. Naffziger, H. C., and Jones, O. W.: Dermoid Tumors of the Spinal Cord, *Arch. Neurol. & Psychiat.*, 33: 941 (May) 1935.

annulus fibrosus. At the fourth lumbar disk such a posterolateral herniation compresses primarily the fifth lumbar nerve just above its exit through the dural sleeve. If it extends far laterally, it can and does, rarely, compress the fourth lumbar nerve in its foramen. If it extends medially, compressing the thecal sac from the side, in addition to the fifth lumbar nerve, it will compress the first and perhaps the second sacral nerve, only displacing the other roots, whose fixation points of exit are lower or on the opposite side. At either the fourth lumbar or the lumbosacral disk an occasional herniation is sufficiently large to compress a number of roots against the ligamentum flavum or the lamina, thereby producing more diffuse signs.

The first sacral nerve can be compressed by such a posterolateral herniation without any indentation of the dura mater, since its dural sleeve emerges above the lumbosacral disk. Although herniation rarely extends far enough laterally to involve the fifth lumbar nerve, this can occur. Far more common is compression of the dural sac in addition to compression of the first sacral root, with resulting involvement of the second and perhaps the third, fourth and fifth sacral roots.

It is the compression of one or more of these components of the sciatic nerve which gives rise to the severe "sciatica." From involvement of either the fifth lumbar or the first sacral root alone, pain can occur along the course of the entire nerve. The sensory as well as the motor innervation of the glutei, hamstrings and leg muscles is contributed to by both these nerves, which explains pain in these muscles. The absence of pain in the iliopsoas, quadriceps femoris and adductors is explained by their higher segmental innervation.

Although pain does occur in the dermatomes of the involved spinal nerves, it is more often lacking. Paresthesias are far more frequent and important in accurate clinical localization especially when coupled with objective sensory signs. Only in exceptional instances is paresthesia or hypesthesia of the gluteal portions of the dermatomes of the fifth lumbar and first and second sacral nerves observed.

The usual absence of involvement of the ankle jerk in herniation at the fourth lumbar disk (involvement of the fifth lumbar nerve) and diminution (involvement of the first sacral nerve) or absence (involvement of the first and second sacral nerves) in herniations at the lumbosacral disk are in keeping with the accepted innervation of the gastrocnemius and soleus muscles by the first and second sacral nerves. Confusing is the fact that these muscles have rarely been found weak and never paralyzed in cases of herniation of the nucleus pulposus.

That these neurologic symptoms and signs are accurate and reliable is attested by the fact that during the past three months we have successfully removed nine consecutive herniations of the nucleus pulposus without confirmation with iodized oil or other contrast mediums. In the same three months iodized oil was used six times, with indication for operation in but two instances. Even in these two cases the clinical evidence pointed with reasonable certainty to the location of the lesion, but as compensation was involved in both cases verification with iodized oil was deemed advisable. The present high incidence of positive results of exploration, in contrast to our earlier results,⁶ we owe chiefly to the increased understanding of the neurologic picture.

6. Bradford, F. Keith, and Spurling, R. Glen: *Intraspinal Causes of Low Back and Sciatic Pain: Results in Sixty Consecutive Low Lumbar Laminectomies*, Surg., Gynec. & Obst., to be published.

SUMMARY

1. Although herniated nucleus pulposus of the fourth lumbar and the lumbosacral disk has long appeared to give an unorthodox neurologic picture, a more thorough experience with this lesion has made possible accurate diagnosis from clinical evidence alone in the majority of instances.

2. The neurologic signs of herniated nucleus pulposus are not peculiar to this clinical entity, since neoplasm along the course of the sciatic nerve, pelvic and rectal disease and disease of the osseous structures may simulate the clinical picture.

Brown Building.

THE DIAGNOSIS OF INTERVERTEBRAL DISK PROTRUSION BY INTRA-SPINAL INJECTION OF AIR

AIR MYELOGRAPHY

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AND

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Air or oxygen serves as an excellent contrast medium in the spinal canal for visualization of a protruded intervertebral disk or any other space-taking lesion. We have used gaseous contrast mediums as a routine for the past three and one-half years with all patients who have had sufficient symptoms and neurologic evidence to make us suspect an intraspinal lesion.¹ Our experience, based on more than 300 spinograms, indicates that the method is accurate and reliable, as in each case in which operation was performed the



Fig. 1.—Normal lumbocaudal sac. Note the sharp definition of the lateral margins of the sac as seen on the anteroposterior projection with the patient in the Trendelenburg position.

exact level of the lesion determined by myelographic examination was verified by laminectomy. The procedure is harmless, so negative results cause no feeling of apprehension as to unpleasant or dangerous sequelae, such as might develop if the contrast medium were an unabsorbable substance.

The use of air in the spinal canal was suggested by Dandy² in 1918, but only in recent years has it been possible to obtain sufficient contrast and detail in roentgenograms to utilize gaseous contrast mediums.

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Read before the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. We have used oxygen as a routine for more than a year because it is absorbed faster than air and produces less discomfort.

2. Dandy, W. E.: *Ann. Surg.* 68: 5 (July) 1918.

In 1934 Coggeshall and von Storch³ showed that the lumbocaudal sac could be visualized by air, but their report was limited to the results with three normal patients. The same year Van Wagenen⁴ reported three cases of complete spinal block in which the lower level of the lesion was visualized by injection of small amounts of air. During the past year we and our associates have reported our use of myelographic examination with air and oxygen in a number of articles.⁵

The technic of injection varies somewhat, depending on the level of the lesion. If a lesion is suspected below the third lumbar vertebra, the patient is placed in a lateral decubitus position, with the head of the table lowered to an angle of from 20 to 25 degrees. An 18 or 20 gage spinal needle is inserted into the subarachnoid space at the second lumbar interspace, and spinal fluid and air are exchanged in 5 cc. quantities until air escapes through the needle. Usually it takes from 40 to 50 cc. to fill the lumbocaudal sac in the adult (fig. 1). In case the clinical evidence places the lesion above the third lumbar vertebra, the spinal needle is inserted in the third lumbar interspace with the patient in a horizontal position and a Queckenstedt test is done. If this



Fig. 2.—Unilateral marginal indentation at the fifth lumbar interspace due to a protruded intervertebral disk. A hypertrophied ligamentum flavum may produce a similar defect. There were complete disappearance of the pain and restitution of function after removal of the disk.

test shows a partial or complete block, from 3 to 6 cc. of spinal fluid is carefully replaced by an equal amount of air so that the spinal fluid pressure is kept as constant as possible. The patient is then placed in the sitting posture with his back against a Potter-Bucky diaphragm for the roentgenograms.

If the Queckenstedt test is negative, the dorsal sac can be visualized by replacement of spinal fluid with air by either lumbar or cisternal puncture. Nearly all our patients had air introduced after lumbar puncture because we are especially interested in the lumbocaudal sac and have examined this area as a routine (even though the signs pointed to a lesion in the dorsal region) in order to obtain normal standards. If the lumbocaudal sac is well filled there will be sufficient air for visualization of the dorsal sac, but in order to get the air into the dorsal region the patient is turned face down and the table changed from the Trendelenburg to the horizontal position. To visualize the subarachnoid

space in the cervical region it is necessary to do either cisternal puncture with the patient in the Trendelenburg position or lumbar puncture with complete drainage of the cerebrospinal fluid as in encephalography.

Visualization of air in the spinal canal depends on roentgenograms of good contrast and detail. We have found that "overexposed" films give us more informa-



Fig. 3.—Normal posterior bulging of the ventral limiting membrane of the lumbocaudal sac seen opposite each intervertebral disk when the patient is in hyperextension. Hyperflexion produces flattening or straightening of this ventral membrane.

tion, so we raise the kilovoltage from 8 to 10 above that necessary for spinal detail. An ordinary horizontal x-ray table equipped with a Potter-Bucky diaphragm is used and, in order to get the necessary Trendelenburg position, one end is elevated by a chair or blocks. The minimal film requirements in the lumbar region are stereoscopic lateral and anteroposterior projections. When the interest is centered in the upper dorsal or cervical region, it is advisable to take stereoscopic oblique projections as well as the lateral ones, because



Fig. 4.—Displacement of the posterior longitudinal ligament dorsad by a herniated intervertebral disk at the fourth lumbar interspace. (Compare with the normal configuration of fig. 3.) Note the narrowing of the interspace. At operation the sac below the protruded disk was almost obliterated by the resultant arachnoiditis.

the superposed shadow of air in the trachea often interferes with interpretation. The normal dorsal curve will cause the air to remain below the fourth or fifth dorsal segment, so the upper part of the thorax should be elevated by small pillows or sand bags under the shoulders, but the head must be lower than the air column or air will ascend into the cranium and produce headache.

3. Coggeshall, H. C., and von Storch, T. J. C.: Diagnostic Value of Myelographic Studies of the Caudal Dural Sac, *Arch. Neurol. & Psychiat.* 31: 611 (March) 1934.

4. Van Wagenen, W. P.: *Ann. Surg.* 99: 939-943 (June) 1934.

5. Scott, Michael, and Young, B. R.: Air Myelography in the Diagnosis of Lesions of the Spinal Canal, *Arch. Neurol. & Psychiat.* 38: 1126 (Nov.) 1937; *Am. J. Roentgenol.* 39: 187 (Feb.) 1938; *Confinia Neurologica*, to be published. Chamberlain, W. E., and Young, B. R.: *Radiology*, to be published.

We have been interested in the effects of hyperflexion and hyperextension on the configuration of the ventral limiting membrane of the lumbocaudal sac. For this reason, as a routine we make additional stereoscopic lateral projections of the lumbar region in these special positions. In every normal case the maneuver of hyperflexion is seen to flatten the contours of the ventral surface of the sac, while hyperextension produces plainly visible bulging of soft tissue contours into the canal opposite each intervertebral disk. In a few cases of intervertebral disk protrusion we have obtained some evidence of accentuation of the disturbance during extension of the spine and partial reduction of the protrusion during flexion. Further studies along these lines are being carried out.

The diagnosis of a herniated disk depends in most cases on the indentation or encroachment of the limiting membrane of the subarachnoid space. The one exception to this is seen when the disk has produced a complete block of the canal and, if this is the case, the inferior margin of the disk is easily demarcated by the air bubble trapped under it (fig. 5). A herniated disk nearly always carries the posterior longitudinal ligament dorsad so that the indentation of the ventral aspect of the air column is usually detected on the lateral projections (fig. 3). Commonly the defect is noted at the level of the interspace, but if the protrusion is marked the ventral limiting membrane of the canal will be pushed dorsad for a variable distance below the interspace (fig. 4). The indentation of the air column due to a herniated disk is not always seen on the lateral

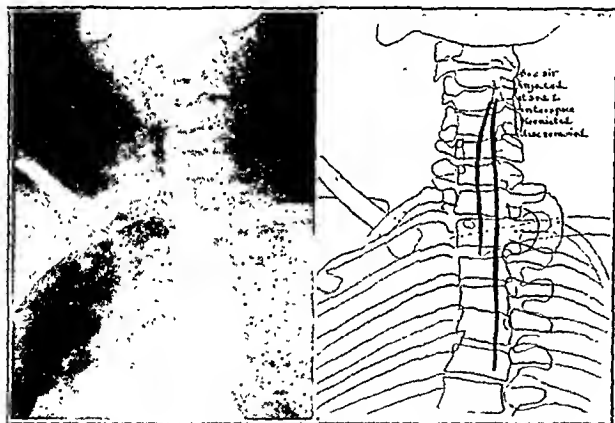


Fig. 5.—Herniated intervertebral disk producing incomplete block of the subarachnoid space at the fourth cervical segment. Three cc. of air trapped under the disk revealed its level. The disk was removed at laminectomy. The roentgenograms were taken immediately after the patient was placed in an upright sitting position.

projections. In a number of cases the defect was visualized only on the anteroposterior projections as a bilateral waistlike constriction or a unilateral marginal indentation (fig. 5).

SUMMARY AND CONCLUSIONS

Myelographic examination with air is a reliable and harmless method of visualizing herniated intervertebral disks and other space-taking lesions in the spinal canal. The success of the method depends on proper technic of air injection and roentgenograms of good contrast and detail. We have had experience with more than 300 spinograms for which air or oxygen was the contrast medium. We consider the method reliable because in every case in which operation was performed the level of the lesion predicted after myelographic examination was verified at laminectomy. Air studies have not been misleading, as there were no instances in which

the myelograms indicated a lesion without verification at operation.

A major advantage of air and oxygen as contrast mediums for myelographic examination is the fact that their use does not entail leaving unabsorbable and possibly irritating substances in the spinal canal. Even those who believe that iodized oil is not contraindicated for myelographic examination tend to reserve its use to cases in which laminectomy is practically assured at the time of the study. Because air and oxygen are completely absorbed from the subarachnoid space (oxygen more promptly than air) there will be less hesitancy about subjecting patients to myelographic examination with such a contrast medium.

THE ROENTGENOLOGIC DIAGNOSIS OF INTRASPINAL PROTRUSION OF INTERVERTEBRAL DISKS

BY MEANS OF RADIOPAQUE OIL

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Since Mixter and Barr¹ in 1934 emphasized the significance of intraspinal protrusion of the intervertebral disks as an important cause of low back pain and sciatica, this condition has aroused no little interest. During the past few years considerable literature concerning the subject has appeared and the condition has been firmly established as a definite clinical and pathologic entity. Pathologic studies of a large series of protruded intervertebral disks by Deucher and Love² indicate that the protruded fragments are composed of fibrocartilage, portions of the nucleus pulposus and occasionally remnants of the notochord. These structures are not ordinarily opaque to roentgen rays and cannot be demonstrated per se in plain roentgenograms. Bone or calcium in quantities gross enough to be revealed roentgenographically is so rare in these protrusions that it is of little practical diagnostic importance.

For this reason the roentgenologist is dependent on the use of some contrast agent for the indirect visualization of the protrusion. Several contrast agents, that is, iodized poppyseed oil,³ air⁴ or oxygen, skiodan,⁵ and colloidal thorium dioxide,⁶ have been employed for visualization of the spinal subarachnoid space. Each of these substances has certain advantages and disadvantages. None of them so far have proved ideal and sooner or later a nonirritating radiopaque agent that can be absorbed and eliminated through the spinal fluid will be developed. Such a substance should do much to expand the usefulness of roentgenologic procedures in the study of neurologic conditions.

To date iodized oil has been used more than any other contrast agent for the roentgenologic visualization of

From the Section on Roentgenology, the Mayo Clinic.
Read before the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Mixter, W. J., and Barr, J. S.: Rupture of the Intervertebral Disk with Involvement of the Spinal Canal, *New England J. Med.* 211: 210-215 (Aug. 2) 1934.

2. Deucher, W. G., and Love, J. G.: Pathologic Aspects of Posterior Protrusion of the Intervertebral Disks, *Arch. Path.* 27: 201-211 (Feb.) 1939.

3. Sicard, J. A., and Forestier, J.: Méthode générale d'exploration radiologique par l'huile iodée (Ipidol), *Bull. et mémoires Soc. méd. d. hôp. de Paris* 1: 463-469 (March 17) 1922.

4. Dandy, W. E.: Roentgenography of the Brain After the Injection of Air into the Spinal Canal, *Ann. Surg.* 70: 397-403 (Oct.) 1919.

5. Arnell, S., and Lidström, F.: Myelography with Skiodan (Abrodil), *Acta radiol.* 12: 287-288, 1931.

6. Radovici, A., and Meller, O.: Encephalo-myelographie par le thorotrast sous-arachnoïdien et épural: Recherches expérimentales, *Compt. rend. Soc. de biol.* 109: 1382-1384 (May 6) 1932.

the spinal subarachnoid space and when employed under proper circumstances it has resulted in an accuracy of diagnosis that is shared by few other roentgenologic procedures. The chief objection to the use of iodized oil is that it is more or less of an irritant to the meninges and is contraindicated in the presence of inflammatory disease. The significance of the irritative action has been discussed pro and con in the literature for some years but nevertheless it is the consensus of observers who have used it in a large number of cases that in properly selected cases the advantages of its use far outweigh any disadvantages that are known.

I have had no experience with the use of colloidal thorium dioxide for visualization of the subarachnoid space. It is very irritating to the cerebral meninges, especially the ependyma, and it is very probable that it has the same effect on the spinal meninges. The fact that it is radioactive and has not been accepted by the Council on Pharmacy and Chemistry of the

American Medical Association makes it a drug to be used with considerable discretion despite its desirability from the standpoint of radiopacity alone.

Fig. 1.—Protruded lumbosacral intervertebral disk. Classic unilateral deformity of iodized oil shadow.

The use of air or oxygen for the study of the spinal subarachnoid space has been revived in recent years and this procedure has much in its favor.⁷ On the other hand there are certain decided disadvantages. In the first place, because of the difficulty in controlling the position and distribution of the air (or oxygen) its use with any satisfaction is restricted to the lumbar canal. Secondly, the accuracy of the diagnosis with air is not equal to that attained with iodized oil. My own experience with the use of air as a substitute for iodized oil in the case of lesions associated with low back pain or sciatic pain indicates that iodized oil is more accurate, that it will reveal certain structures not demonstrated with air, and that it has localized lesions that air has failed to disclose. There is no doubt that air will reveal some lesions very satisfactorily and can be used in many instances before iodized oil is resorted to. However, the results of such an examination following the use of air should be carefully appraised by the clinician in view of the limitations of its accuracy.

INDICATIONS FOR THE USE OF IODIZED OIL

The indiscriminate use of iodized oil in cases of low back or sciatic pain is not recommended. No contrast agent should be used unless the clinical and neurologic examination indicates the possible presence of an intraspinal lesion that cannot be localized by ordinary clinical procedures. Increasing familiarity with the history and neurologic examination in cases of protruded intervertebral disks indicates that in a fair proportion of cases the diagnosis and localization of the protrusion can be made clinically without resorting to any contrast agent.⁸ With this improvement in clinical diagnostic acumen the necessity for the use of a contrast

agent will probably diminish and be reserved for those cases in which the diagnosis is in doubt and those in which it is desirable to establish a very precise anatomic level of the lesion for the guidance of the neurosurgeon.

If the suspected level of a lesion is at the conus or above, experience indicates that the use of air or oxygen will not be helpful unless obstruction of the subarachnoid space has occurred. This results from the fact that air or oxygen is very difficult to hold in position in the thoracic or cervical portion of the spinal canal, and their use in these regions is further complicated by the superimposition of the shadow of air in the trachea, larynx and pharynx, which renders the interpretation of resulting shadows exceedingly difficult or impossible. Iodized oil, therefore, is the medium of choice for the demonstration of lesions at or above the conus.

Statistics indicate that the great majority of protruded intervertebral disks occur in the lumbar and lumbosacral regions where they are accessible to exami-

Multiple Protruded Intervertebral Disks

Affected Disks	Number of Cases
Fifth and fourth lumbar.....	6
Fourth and third lumbar.....	14
Third and second lumbar.....	1
First lumbar and twelfth thoracic.....	1
Twelfth and eleventh thoracic.....	1
Eleventh dorsal.....	1
Third, fourth and	1
Second, third and	1
Eleventh dorsal.....	1
Total.....	27

nation by either air or iodized oil.⁹ Since there is a reasonable chance that the protrusions may be disclosed by air or oxygen, it is probably good judgment to attempt their localization by this means before iodized oil is resorted to. If the air studies are inconclusive or unsatisfactory, iodized oil may then be used. If the air studies are negative and the history and neurologic examination are suggestive of the presence of a protruded disk, iodized oil should be used to check the spinogram. When the air studies reveal either a deformity that will not account for the patient's symp-

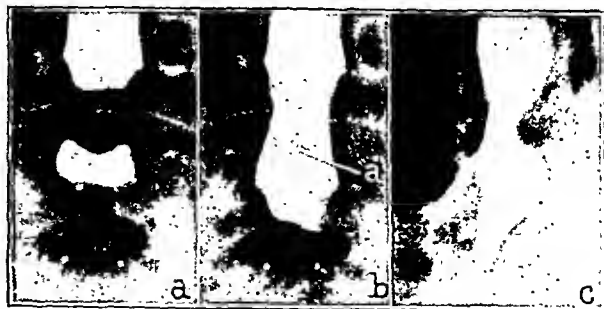


Fig. 2.—Central type of protruded intervertebral disk. Various deformities occurring in the same case: (a) Deformity of iodized oil that results when oil is allowed to collect above and below the protrusion. (b) Apparent obliteration of defect when the mass of iodized oil is permitted to pass over protrusion. The site of the protrusion is still revealed by the area of diminished density at arrow a. (c) Prone-oblique position revealing deformity typical of protruded disk.

toms or a lesion the level of which is not compatible with the symptoms, the results should be confirmed with iodized oil before laminectomy is advised.

AMOUNT OF IODIZED OIL

It is well known that small amounts of iodized oil (from 0.2 to 2 cc.) will localize the site of completely

7. Young, B. R., and Scott, Michael: Air Myelography: The Substitution of Air for Lipiodol in Roentgen Visualization of Tumors and Other Structures in the Spinal Canal, *Am. J. Roentgenol.* 39:187-192 (Feb.) 1938.

8. Craig, W. McK., and Walsh, M. N.: The Diagnosis and Treatment of Low Back and Sciatic Pain Caused by Protruded Intervertebral Disk and Hypertrophied Ligaments, *Minnesota Med.* 22:511-517 (Aug.) 1939.

9. Camp, J. D., and Addington, E. A.: Intraspinal Lesions Associated with Low Back Pain and Their Localization by Means of Lipiodol Within the Subarachnoid Space, *Radiology*, to be published.

obstructing lesions, but the neurologic examination in these cases usually gives results that nowadays the level can be established without the use of iodized oil.



Fig. 3.—Protruded intervertebral disk. Bilateral type of iodized oil deformity.

The majority of protruded intervertebral disks do not produce obstruction and 12 per cent of protruded intervertebral disks in my experience have been

In the interest of early diagnosis and for the localization of lesions before obstruction has occurred, it is necessary to use a quantity of iodized oil sufficient to fill the subarachnoid space completely at any desired level. For several years I have advocated the use of 5 cc. of iodized oil because I have found from previous experience with smaller amounts that this is the optimal volume for accurate and consistent localization of nonobstructing lesions.¹⁰ Some lesions can be shown with lesser quantities but on the other hand a number of surprisingly large lesions and particularly multiple lesions are easily overlooked if amounts less than 5 cc. are used.

though the majority occur in a region of the spinal column that is easily examined. In my experience, reactions following the injection of 5 cc. have been no greater than those observed with 2 cc.

TECHNIC OF INJECTION

The lumbar injection of iodized oil is preferred because it is easier and safer to carry out than cisternal puncture and will facilitate the keeping of the oil together as one mass in the lower part of the spinal column—a point that is very important for the demonstration of small lesions. It is important that the iodized oil used be clear, transparent and only faintly yellow. Oil that is brownish should be discarded, since this indicates deterioration and the presence of free iodine, which is undesirable. Prior to injection the ampule is warmed to a temperature of 105 F., which will increase the fluidity of the oil and facilitate its injection. If the

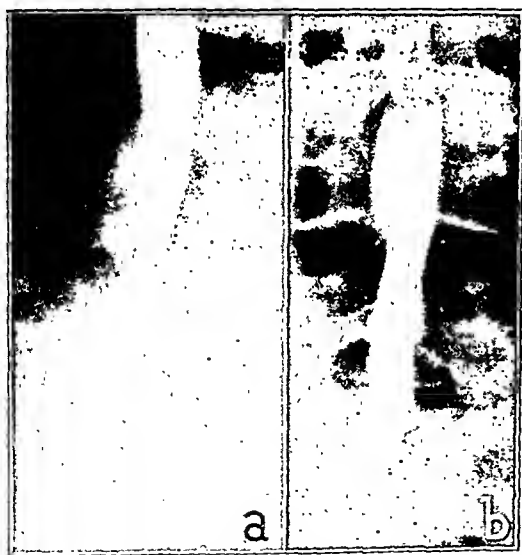


Fig. 4.—Primary hypertrophy of the ligamentum flavum without associated protrusion of the intervertebral disk; (a) lateral view revealing broad indentation on posterior aspect of column of iodized oil characteristic of hypertrophied ligamentum flavum; (b) anteroposterior view revealing broad bilateral indentation of iodized oil shadow resulting from hypertrophy of the ligamentum flavum. The deformity is more marked on the left side.

multiple, as shown in the table. For this reason I still believe that 5 cc. of iodized oil is the optimal amount to use for the demonstration of protruded disks even



Fig. 5.—Protruded intervertebral disk between fourth and fifth lumbar vertebrae and associated hypertrophy of the ligamentum flavum. Characteristic deformity of iodized oil: (a) Lateral view. Iodized oil shadow is indented anteriorly by the protruded intervertebral disk and posteriorly by the hypertrophied ligamentum flavum. (b) Anteroposterior view. Note broad extent of deformity corresponding to site of ligamentum flavum.

injection is made with slow continuous pressure on the syringe, droplet formation within the subarachnoid space will be avoided.

ROENTGENOLOGIC TECHNIC

It is desirable that the roentgenologic study be carried out as soon after the injection as possible, as delayed examination and movements of the patient may lead to separation of the mass of oil and droplet formation. A tilting fluoroscopic table with appropriate foot and shoulder rests is necessary for the roentgenologic examination. Some method of quickly recording the fluoroscopic image on films is highly desirable. If a spot film device is not available, excellent films may be made by sliding a cassette under the fluoroscopic screen, delimiting the area by the fluoroscopic shutters and changing from fluoroscopic to radiographic technic by means of a quick change-over switch on the control panel. In addition to localized "spot" films of the lesion, a large film revealing several contiguous vertebrae is

10. Camp, J. D.; Adson, A. W., and Shugrue, J. J.: Roentgenographic Findings Associated with Tumors of the Spinal Column, Spinal Cord and Associated Tissues, *Am. J. Cancer* 17: 348-372 (Feb.) 1933. Camp, J. D.: Multiple Tumors Within the Spinal Canal: Diagnosis by Means of Lipiodol Injected into the Subarachnoid Space (Mycelography), *Am. J. Roentgenol.* 36: 775-781 (Dec.) 1936.

necessary in order to establish the anatomic level accurately. This is extremely important when surgical intervention is contemplated, because congenital variations at the lumbosacral junction or the presence of additional lumbar vertebrae may easily mislead the surgeon when counting spinous processes to determine the site for laminectomy.

The details concerning the actual technic of the roentgenologic examination for determining the presence of a protruded intervertebral disk have been published previously and will not be repeated here.¹¹ If the result of the examination of the lumbar spinal subarachnoid space is negative, I believe that it is important to examine the subarachnoid space higher up, as recent observations⁹ have revealed that 50 per cent of patients with tumors of the spinal cord located in the thoracic region and 30 per cent of patients with such tumors located in the cervical region have low back or sciatic pain or both as an associated or coincident symptom. Quantities of iodized oil less than 5 cc. are not practical for this phase of the examination because, smaller masses of oil are rapidly diminished in size by the droplets that normally separate out and lag behind as the oil moves cephalad through the thoracic region. The quantity thus remaining for study of the upper thoracic and cervical regions is totally insufficient to portray even a large protruded disk.

ROENTGENOLOGIC CHARACTERISTICS OF PROTRUDED INTERVERTEBRAL DISKS

The deformity of the iodized oil shadow resulting from a protruded intervertebral disk is influenced by the following factors: (1) the position of the protrusion, (2) size of the protrusion, (3) associated hypertrophy of the ligamentum flavum, (4) changes in the nerve roots (displacement, edema, nonfilling of affected nerve root sleeve) and (5) anatomic variations of the cul-de-sac.

Position of the Protrusion.—Except in very unusual cases the protruded fragment is situated in the anterior portion of the spinal canal and will produce its maximal effect on the column of iodized oil when the patient is lying in a prone or prone-oblique position. Since the majority of protruded intervertebral disks present on one side of the median line, the classic defect is a sharply defined unilateral rounded indentation of the iodized oil shadow opposite an intervertebral disk (fig. 1). It occurs in about 65 per cent of cases. Midline protrusions when of moderate size may produce only a central defect. They are most obvious when some of the oil is allowed to accumulate just above and just below the

lesion (fig. 2 a). When the table is elevated and a large quantity of iodized oil is permitted to flow over the point of maximal protrusion, the central defect may appear to be obliterated and convey the erroneous impression that the region is normal (fig. 2 b). Repeated observations at the site of such lesions will reveal that the central defect will reappear whenever the oil is allowed to move slowly away from the protrusion and uncover the "hump" produced by the lesion. In the prone-oblique or lateral position the defect of a central protrusion will be quite obvious and the shadow of the iodized oil that passes over the peak of the protrusion will be clearly defined (fig. 2 c). Large central protrusions are easily recognized because the deformity that they produce cannot be effaced regardless of the amount of iodized oil at the site of the lesion. Partial obstruction is common in large central lesions.

Size of the Protrusion.—The extent of the iodized oil defect is influenced naturally by the size of the protrusion. Any deformity to be of diagnostic significance must be persistent, although the extent of the deformity may be somewhat influenced by the volume of iodized oil at the site of the lesion. In contrast to central protrusions, unilateral lesions are usually most obvious when a large mass of oil is present about it. Except as the iodized oil deformity may be influenced by the presence of associated hypertrophy of the ligamentum flavum, the larger the protrusion the greater the obstruction of the subarachnoid space will be. Partial obstruction occurs in about 11 per cent of cases and complete obstruction in only about 2.5 per cent of cases. The larger the protrusion the greater the tendency to produce a bilateral deformity, which occurs in about 35 per cent of cases (fig. 3). The presence or absence of a bilateral deformity is also influenced considerably by the presence or absence of hypertrophy of the ligamentum flavum.

Hypertrophy of the Ligamentum Flavum.

This condition has been found frequently by neurosurgeons in conjunction with a protruded intervertebral disk. It generally occurs at the same level as the protrusion but may occasionally be found at other interspaces. Localized hypertrophy of the ligamentum flavum without coincident protrusion of a disk is not common, but when it does occur it may imitate all the clinical phenomena of a protruded intervertebral disk. Normally the ligamentum flavum forms the posterior boundary of the intervertebral foramen and extends posteriorly on each side to the midline, thus enclosing the spinal canal between the laminae.



Fig. 6.—Protruded intervertebral disk between fourth and fifth lumbar vertebrae. Iodized oil deformity is on the right side. Defect due to edema of affected nerve root and obliteration of usual shadow of nerve sleeve is indicated by arrow. Note normal shadow of nerve sleeve on opposite side.



Fig. 7.—Protruded intervertebral disk between second and third lumbar vertebrae. Complete obstruction of iodized oil. a, shadow of edematous right second lumbar root, which is compressed by protrusion.

11. Camp, J. D.: Roentgenologic Findings in Cases of Protruded Intervertebral Disks. Proc. Staff Meet., Mayo Clin. 12: 373-377 (June 16) 1937. Love, J. G., and Camp, J. D.: Root Pain Resulting from Intraspinal Protrusion of Intervertebral Disks: Diagnosis and Surgical Treatment. J. Bone & Joint Surg. 19: 776-804 (July) 1937.

Because of the anatomic location of the ligamentum flavum, this structure when it hypertrophies will compress the column of iodized oil posteriorly and laterally. Hypertrophy of the ligamentum flavum, when it occurs without associated protrusion of an intervertebral disk, is characterized in the lateral view by a broad or rounded indentation on the posterior aspect of the



Fig. 8.—Protruded lumbosacral intervertebral disk. Iodized oil reveals narrow cul-de-sac and also slight indentation on right side at site of protrusion.

column of iodized oil between contiguous laminae⁹ (fig. 4a). In the prone or supine position the hypertrophy may be portrayed by broad indentation of the column of iodized oil, sometimes unilateral but generally bilateral (fig. 4b). There is no constant relation between the degree of hypertrophy of the ligamentum flavum and the size of the associated protruded intervertebral disk. It is not uncommon to find a marked hypertrophy of the ligamentum flavum in association with a moderate protrusion of the disk, and under such circumstances the defect produced by the ligamentum flavum is the predominant part of the visible deformity.

Because of the size and extent of the normal ligamentum flavum, the iodized oil deformity that results when it hypertrophies will extend over a longer area than that occupied by the contiguous intervertebral space and the area occupied by a protruded disk unless the disk fragment is unusually large. Early in this work, before the significance of hypertrophy of the ligamentum flavum was recognized, it was sometimes difficult to reconcile the large iodized oil deformity in certain cases with the small protruded disk that was found at operation. It is now clear that the defect was largely the result of a hypertrophied ligament, the deformity of which was not recognized.

When considerable hypertrophy of the ligamentum flavum accompanies a large protruded disk, the iodized oil defect is characteristic. The mass of iodized oil is compressed between the protruded disk anteriorly and the hypertrophied ligamentum flavum posteriorly and laterally. The resultant deformity is shown in figure 5a and b. The narrow streak of iodized oil in the midline represents the small quantity of oil that remains beneath the angle posteriorly where the right and left halves of the ligament meet. The upper and lower limits of the defect are sharply defined owing to the termination of the ligamentum flavum along its point of insertion on the contiguous laminae.

Changes in the Shadows of Nerve Roots.—The shadows of nerve roots composing the cauda equina are frequently visualized in the roentgenograms that are made during the course of the study with iodized oil. In about one third of the cases of protruded intervertebral disk, lateral or posterior displacement of the nerve root shadows or both will be visible at the site of the protrusion. The presence of such changes is helpful in supporting a diagnosis of protruded inter-

vertebral disk when the other iodized oil appearances are atypical or are minimal in extent.

Edema of Contiguous Nerve Roots.—The significant symptoms of a protruded disk are the result of pressure exerted on the nerve roots by the protruded fragments. Edema of an affected nerve root may result in three ways: (1) by irritation of the root as it passes over the protruded disk, (2) by compression of the root between a protruded disk and the contiguous pedicle of the vertebra or (3) by compression of the root between a protruded disk and a hypertrophied ligamentum flavum either within the spinal canal or at the point of emergence through the intervertebral foramen. In the latter case pressure on the nerve is further increased by narrowing of the intervertebral foramen, which results from the hypertrophied ligamentum flavum which forms its posterior boundary. The edematous nerve root will displace additional iodized oil at the site of protrusion and correspondingly increase the deformity. An early change resulting from edema of a nerve root is obliteration of the usual shadow of the nerve sleeve where the root passes through the dura (fig. 6). In some cases the shadow of an edematous nerve root may extend one or more segments above the level of the protrusion (fig. 7). anomalies of the terminal portion of the cul-de-sac, which occur in about 5 per cent of cases, may complicate the roentgenologic diagnosis of a protruded

Anatomic Variations of the Cul-de-Sac.—Two lumbosacral intervertebral disk. The first of these is an anomaly in which the cul-de-sac terminates at the usual site about the level of the second sacral segment but is considerably narrower than normal below the level of the fourth lumbar intervertebral space (fig. 8). In such a case a moderate protrusion of a lumbosacral



Fig. 9.—Protruded intervertebral disk between fourth and fifth lumbar vertebrae. Note absence of shadow of nerve sleeve at site of protrusion. Anomaly of the cul-de-sac, which is short and terminates just below the lumbosacral interspace. Compare with figure 1, in which the cul-de-sac presents the usual normal appearance.

disk may be present without deforming the iodized oil in the narrow subarachnoid space and a large protrusion may produce only a minimal defect. The second anomaly is one in which the cul-de-sac terminates one or two segments more cephalad than usual with or without a variation in its diameter (fig. 9). In a few instances the cul-de-sac will terminate above the level of the lumbosacral interspace. In the presence of either condition but especially of the latter, it is obvious that a lumbosacral protrusion may not be disclosed by iodized oil or any other contrast agent. When such anomalies are present and the iodized oil examination is found to be negative, the roentgenologist should state that the presence of a protruded lumbosacral intervertebral disk cannot be excluded. This is important, because if the history and physical signs indicate the probable presence of a protruded intervertebral disk, an exploratory laminectomy over the lumbosacral interspace may be advisable.

ACCURACY OF THE METHOD

In a series of 203 cases in which laminectomy was performed and in which a roentgenologic diagnosis of protruded intervertebral disk had been made, the diagnosis was confirmed by the surgeon in 194 instances.⁹ In one case no lesion was found to account for the iodized oil deformity (error of commission). In eight instances a lesion other than a protruded disk was found by the surgeon (error of interpretation) and they may be listed as follows: chronic arachnoiditis with contraction of the dura, one; fracture of a twelfth thoracic facet, one; vascular tumor, varices and so on, four; hypertrophied ligamentum flavum, one; neurofibroma, one. In the same period a protruded intervertebral disk was found by the surgeon in seven other cases in which the iodized oil examination had been reported as negative. It is interesting that all of these occurred at the lumbosacral junction, where there is a very good anatomic reason for the error. At this level the spinal canal is relatively large and the diameter of the caudal sac may be small because of its fusiform termination. Under such circumstances even a large protruded disk may exist without indenting the sac. In five of these seven cases an anomaly of the cul-de-sac, as referred to, was present. It is obvious therefore that the iodized oil studies revealed the presence or absence of a protruded intervertebral disk with an accuracy of 92.3 per cent in a series of 210 cases on which operation was performed.

PROTRUDED INTERVERTEBRAL DISKS

WITH A NOTE REGARDING HYPERTROPHY OF LIGAMENTA FLAVA

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Protrusion of intervertebral disks into the spinal canal is a subject that has been much discussed during the recent few years.¹ That it should assume a large place in our daily efforts to relieve pain and suffering is justified because of the frequency with which we are called on to treat intractable low back and sciatic pain, which often is an expression of protrusion of an intervertebral disk or disks in the lumbar region of the spinal column. The protrusion of a portion of one or more intervertebral fibrocartilages, with the consequent compression of the spinal cord or of one or more nerve roots, provides us with a real anatomic and pathologic explanation for the disability experienced by many patients. Such an explanation has been sorely needed. Too many patients have been treated, all too often unsuccessfully, for such incorrect and meaningless diagnoses as "lumbosacral strain," "sacro-iliac dislocation," "sciatic scoliosis," "sciatic neuritis" and "lumbago."

Before proceeding further I should like to make myself clear regarding the frequency of the condition of protruded intervertebral disk which we are today able to diagnose accurately, and I should like to warn against considering every case of low back and sciatic pain a case of protruded disk. There are many other causes of pain in the lower part of the back and for pain which extends into one or both lower extremities.

At the Mayo Clinic, every person with low back and sciatic pain is seen by an orthopedic consultant either

before the patient is referred to the neurologic section or in consultation with the neurosurgeon. Dr. Henderson² has collected figures from the cross-index filing system of the clinic which show that during the years 1935, 1936 and 1937 only 1.8 per cent of the patients seen by the orthopedic consultants because of low back and/or sciatic pain underwent laminectomy because of a diagnosis of protruded intervertebral disk. After the patients have been given their general physical and orthopedic examinations and the majority of those having low back and sciatic pain have been segregated, so to speak, only about 40 per cent of the patients suspected of having an intraspinal lesion as the causative factor in the complaint and referred to the neurologic section for further investigation come to operation for protruded intervertebral disk at the hands of the neurosurgeons.³

With this as an introduction to general discussion, the analysis of our more than 300 proved operative cases should excite no alarm about what might be considered our "radical" treatment of sciatic pain. In fact, it would seem that evidence is sufficient to justify the statement that laminectomy accompanied by removal of the protruded portion of an intervertebral disk is possibly the least radical of any known curative treatment for such a disabling condition.

During the past few years our experience with protruded intervertebral disks has been so extensive that we have been able, after a careful analytic study, to formulate a characteristic symptom complex for the lumbar lesions.²

A patient presenting himself for treatment with a complaint of intractable low back and sciatic pain, and who on examination exhibits spasm of the lumbar muscles, loss of the normal lumbar lordosis, positive Lasègue's and Kernig's signs, sciatic tenderness and diminution or absence of the homolateral achilles tendon reflex, is very likely to be suffering from a protruded intervertebral disk. If, in addition, there is a moderate elevation of the total protein content of the cerebrospinal fluid obtained on puncture in the lower part of the lumbar segment, and if there is a narrowing of the fourth or fifth lumbar intervertebral space, the picture is complete and a diagnosis of protrusion of a

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2. Henderson, M. S., in discussion on Walsh, M. N., and Love, J. G.: The Syndrome of the Protruded Intervertebral Disk, Proc. Staff Meet., Mayo Clin. 14: 233-234 (April 12) 1939.
3. Woltman, H. W.: Personal communication to the author.

From the Section on Neurologic Surgery, the Mayo Clinic.
Read before the Section on Radiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.
1. Articles on the subject (continued in next column):

lumbar disk is justified. I have removed by surgical intervention at the time of laminectomy a classic protrusion of the disk in ten such cases without the use of radiopaque oil. Dr. Craig,⁴ up to Dec. 9, 1938, had operated in twenty-seven cases in which the clinical diagnosis was made without the use of a contrast medium.



Fig. 1.—Anteroposterior view after operation showing the small amount of the laminae of the fifth lumbar vertebra which it was necessary to remove in order to remove a protrusion of the lumbosacral disk.

In spite of our ability to diagnose the lesion accurately in some cases, it seems to me that it is the better part of wisdom to employ a contrast medium in almost a routine way as a safeguard against overlooking multiple lesions, which we found in 12 per cent of cases in which radiopaque oil was used,⁵ and to enable the surgeon to perform as short a laminectomy as possible (figs. 1 and 2). A shorter laminectomy naturally means a shorter operation, a shorter period of anesthesia and, to a certain extent, a shorter convalescence.

Just as there are some cases which are so typical that a clinical diagnosis of protruded intervertebral disk can be made and operation advised without visualization of the lesion by a contrast medium, there are occasional patients for whom we have advised and performed laminectomy for protruded intervertebral disk in spite of the failure of radiopaque oil to disclose an intraspinal lesion. I have operated on eleven such patients up to Nov. 22, 1938.⁶ It was, in fact, the experience gained with these patients that led Dr. Craig and me to operate, without the employment of a contrast medium, on other patients having typical cases of protruded disk.

The following two reports will illustrate the points (1) of negative roentgenologic study made with radiopaque oil in the presence of a protruded intervertebral disk in the lumbosacral articulation and (2) a direct exploration for protruded disk on the basis of a clinical diagnosis.

REPORT OF CASES

CASE 1.—A woman aged 48 registered at the clinic Sept. 20, 1938, with a history of intractable left sciatic pain. She had sustained a slight injury to the back at the age of 12 or 13. Between the ages of 14 and 47 she had experienced many episodes of what was called "lumbago." The attacks of "lumbago" were usually precipitated by unusual exercise. In April 1938 she made a misstep and felt something give way in her back. It was necessary for her to sit down immediately; then she noticed an inability to cross her legs. After ten minutes she tried to get up, but she screamed with an excruciating pain in the back in the left sacro-iliac region. For four days she was unable to void urine or move her bowels. After a few days the pain began to radiate down the posterior surface of the left thigh. This pain was exaggerated by coughing and sneezing. After two weeks' time the pain began to subside and she was fairly comfortable until ten weeks prior to admission to the clinic, when she noticed gradually increasing pain in the left thigh with tendency of the pain to radiate to the left groin. The pain was so severe that it interfered with sleep, and the usual methods of treatment failed to give relief.

On examination a positive Lasègue's sign was elicited on the left side. Reflexes of both achilles tendons were markedly diminished. There was weakness of extension of the left toes and definite tenderness along the course of the left sciatic nerve. Roentgenologic examination of the spinal column revealed a narrowing of the space between the bodies of the fifth lumbar and first sacral vertebrae. Diagnostic spinal puncture revealed a total protein content of 40 mg. per hundred cubic centimeters of cerebrospinal fluid, with normal hydrodynamics. Roentgenologic examination of the spinal canal after introduction of 5 cc. of radiopaque oil did not disclose any intraspinal lesion. The patient was treated by Buck's extension of both extremities, a lumbar sling and diathermy. She was

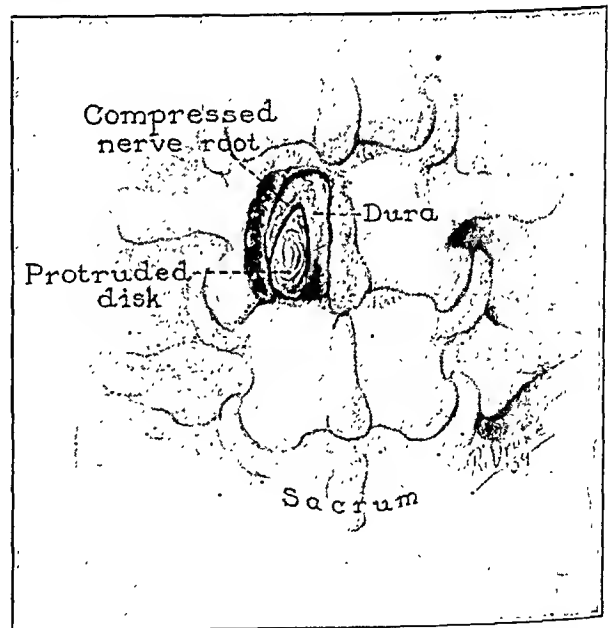


Fig. 2.—Hemilaminectomy in the lumbar region for removal of unilateral protrusion of an intervertebral disk. Only a portion of the lamina on the left side was removed in this instance.

closely observed but failed to obtain any benefit. In spite of the negative results yielded by roentgenologic examination with radiopaque oil Dr. Ghormley, Dr. Walsh and I felt that the patient might have a protruded disk. Exploratory laminectomy for such a lesion was advised with the understanding that if a protruded disk was not found the patient was to undergo operation for bone graft, to be performed by Dr. Ghormley.

October 10 hemilaminectomy of the left lamina of the fifth lumbar vertebra was performed. As soon as this piece of bone had been removed, a marked thickening of the ligamentum flavum between the fifth lumbar and first sacral vertebrae was

4. Craig, W. McK.: Personal communication to the author.

5. Camp, J. D.: Unpublished data.

6. Love, J. G.: Protruded Intervertebral Disk (Fibrocartilage), to be published.

observed. When the left half of the ligamentum flavum was resected, characteristic edema of the nerve root was observed and when the enlarged nerve root was retracted a large unilateral protrusion of the disk between the fifth lumbar vertebra and the first sacral vertebra was uncovered. The protrusion was still partially maintained by the posterior longitudinal ligament and, when this ligament was incised, two large fragments of fibrocartilage escaped.

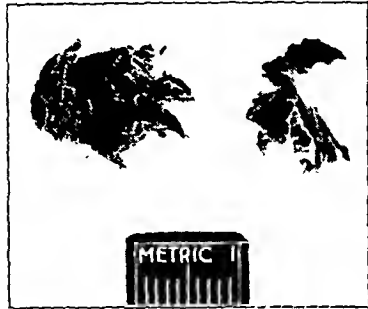


Fig. 3.—Two fragments of fibrocartilage which constituted the protrusion in case 1.

The removal of these fragments (fig. 3) restored the spinal canal to normal size and shape and removed pressure from the edematous nerve root. The radiopaque oil was then removed from the subarachnoid space and the wound was closed in layers.

Dr. Ghormley was present at the operation and agreed with me that sufficient cause for the patient's symptoms had been

found and removed and that operation for bone graft was unnecessary. The patient's convalescence was uneventful except for the flare-up of an old subdeltoid bursitis. She was dismissed from our care October 27, at which time her wound was completely healed and she was free of her low back and sciatic pain.

CASE 2.—A man aged 35 came to the clinic with the chief complaint of pain in the left area of distribution of the sciatic nerve. Four years prior to admission to the clinic, while stooping over, he felt a snap in his back, immediately followed by severe pain in the lower part. Three years later severe aching and shooting pain developed in the left sciatic distribution. The pain was worse at night and often was relieved by getting out of bed and walking about. The sciatic pain was aggravated by coughing, sneezing and bending the head forward. For three months there had been constant low back and sciatic pain and the patient was unable to work. He walked with a distinct limp and a list. The left achilles tendon reflex was absent. There was a total protein content of 90 mg. per hundred cubic centimeters of cerebrospinal fluid. The original roentgenogram disclosed narrowing of the space between the fifth lumbar and first sacral vertebrae. Motions of the spinal column were markedly limited and Kernig's and Lasègue's signs were positive on the left. Because of the classic history and signs, the patient was operated on for a protruded intervertebral disk without the use of a contrast medium. The spinous process and the laminae of the fifth lumbar vertebra were removed. A large protrusion on the left of the disk between the fifth lumbar and the first sacral vertebrae was removed with complete relief of the patient's symptoms.

If the neurosurgeon undertakes to perform laminectomy for protruded lumbar disk without a previous demonstration of an intraspinal defect as outlined by the contrast medium, or if laminectomy is done after a study with radiopaque oil in which results were negative, the patient should be told of the possibility of an exploratory operation which may show nothing. However, in the light of our experience, a clinical diagnosis can be made with a degree of accuracy that is far above that of other commonly made diagnoses.

Before undertaking such an operation, it is essential to know what disks are most likely to be involved and it is well to bear in mind that the lesion is not infrequently multiple (10 per cent of all lesions were multiple in the series in which operation was performed). Of 300 patients operated on, fifteen suffered disk protrusions in the cervical or thoracic region of the spinal canal. I do not believe a neurosurgeon is justified

in operating for a cervical or thoracic protrusion without first obtaining a roentgenologic demonstration of the suspected lesion with a contrast medium, unless there is a definite sensory level, which is always sufficient to justify laminectomy for an intraspinal lesion. However, since 96 per cent of all protrusions in the aforementioned 300 cases occurred at the third, fourth or fifth lumbar vertebral interspace, a direct operation for a lumbar protrusion based on a careful analysis of the observations should not often fail to disclose the lesion, and since in 84 per cent of the 300 cases referred to the protrusions occurred at the fourth or fifth lumbar interspace, the disks at these two interspaces should be exposed first. A removal of the laminae of the fifth lumbar vertebra and a resection of the fourth and fifth lumbar ligamenta flava will result in adequate exposure. If there is a protruded disk, its presence usually will be signalized by a marked thickening of the ligamentum flavum at that particular interspace (fig. 4). In a consecutive series of 175 cases of protruded disk, a note was made on the surgical cards of 155 cases that there was a definite, abnormal thickening or hypertrophy of the contiguous ligamentum flavum. In our earlier cases we came to look on the edema of the involved nerve root as the sentinel which led to detection of the protruded disk.⁷ In the light of subsequent experience we have been warned, and usually of the site, of the protrusion by the thickening of the ligamentum flavum even before the edematous nerve root can be seen.⁸

But the yellow ligament which bridges the space between the laminae of adjacent vertebrae is by no means always thickened. It may be normal in thick-

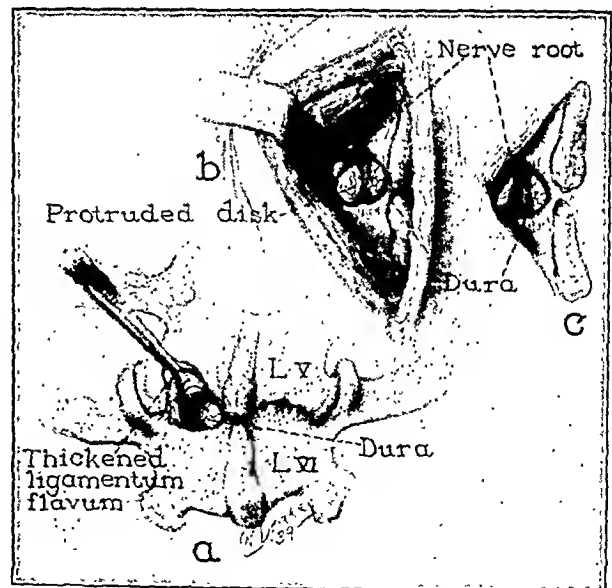


Fig. 4.—How the protruded part of an intervertebral disk was removed without the performance of laminectomy. This was the second instance in which the protrusion of the disk was exposed and removed after the resection of a very thick ligamentum flavum without the resection of any portion of the laminae of the adjoining vertebra: a, resection of the hypertrophied portion of ligamentum flavum; b, exposure of the protruded intervertebral disk; c, the spinal canal restored to normal after the removal of the protruded fragments of the disk.

ness; in a few cases I have seen it thinned as if it had been eroded by the protruded fragments of disk substance. In one case I found that a long fragment of

7. Love, J. G.: Protrusion of the Intervertebral Disk (Fibrocartilage) into the Spinal Canal, *Proc. Staff Meet., Mayo Clin.* 11:529-534 (Aug. 19) 1936.

8. Love, J. G., and Walsh, M. N.: Protruded Intervertebral Disks: Report of One Hundred Cases in Which Operation Was Performed, *J. A. M. A.* 111:396-400 (July 30) 1938.

mentum flavum, much as a straw has been known to perforate a wood post during a tornado.⁹

The important point to remember about the ligamentum flavum is that although it may be of sufficient size to compress the nerve roots, causing intractable pain, this phenomenon without an associated protrusion of the disk is rare. In operating on 300 patients who had proved protruded disk, we have encountered only twelve cases of hypertrophy of the ligamentum flavum without an associated disk protrusion. Whenever a hypertrophied ligament is found, a diligent search should be made for protrusion of the underlying disk. The following case report is illustrative:

CASE 3.—A man aged 40 had had recurrent attacks of lumbago for twenty-four years. The attacks would occur once or twice a year and usually necessitated the patient's remaining in bed for a week or ten days. For ten years he had suffered a constant dull, aching pain in the lower part of the back. This pain was aggravated by motion. At no time was there any sciatic projection of the pain. Eight months prior to operation the patient experienced a sharp pain in the right lumbar region while bending over to pick up an object from the floor. This sharp pain in the right lumbar region persisted until the time of operation. At epidural injection there was a marked exaggeration of the severe, sharp pain in the lower part of the back, but at no time was there any extension of the pain into the hips or legs. The total protein content of the spinal fluid was 120 mg. per hundred cubic centimeters of cerebrospinal fluid. Roentgenologic study aided by radiopaque oil revealed a persistent defect opposite the interspace between the eleventh and twelfth thoracic vertebrae which was interpreted as a classic defect for a hypertrophied ligament without disk protrusion. At the time of laminectomy, a hypertrophied ligamentum flavum and a protrusion of the underlying disk at the eleventh thoracic interspace were removed. The patient has obtained complete relief from his backache since operation and he states that he now feels better than he has felt for many years. It is interesting to observe that this patient had suffered a marked narrowing of the space between the fifth lumbar and first sacral vertebrae with some hypertrophic changes yet at no time did he experience sciatic pain. Clinically, an intraspinal lesion occurring in the lower thoracic region was considered to be a diagnosis much more likely to be proved at operation as a cause of this patient's symptoms than the diagnosis of a lesion at the lumbosacral articulation, where a definite abnormality was seen on the usual roentgenologic examination.

TREATMENT OF PROTRUDED INTERVERTEBRAL DISKS

When the presence of a protruded disk has been diagnosed, a decision as to the proper treatment must be reached. If the patient's symptoms are mild and do not interfere to any great extent with his usual activities, some one of the more common therapeutic measures may be employed. However, the presence of the lesion must not be disregarded or passed over lightly, because another slight injury to the back may result in further protrusion of the involved disk, with sufficient narrowing of the spinal canal to produce paralysis of the legs. Case 4 emphasizes this point:

CASE 4.—A man aged 38 had for twenty-one years experienced a yearly recurrence of pain in the lower part of the back. The first attack had occurred following the lifting of a heavy sack, and each subsequent attack followed unusual stress, such as the lifting of heavy objects. One week prior to admission there was a sudden onset of severe pain in the lower part of the back, with bilateral sciatic extension, occasioned by the patient's efforts while cranking a tractor. Three days before admission a "dead feeling" developed in the right leg and there was gradually increasing motor weakness in the

right lower extremity. For two days he had suffered incontinence of both bladder and bowel. The patient had noticed the development of a cough during the same day on which he had injured his back while cranking the tractor.

The neurologic examination showed a reduction of severe degree in motor power of the right leg. The achilles tendon reflexes of both extremities were absent. There was anesthesia in the cutaneous areas supplied by the fifth lumbar and first sacral nerves on the right. A diagnostic spinal puncture in the fifth lumbar interspace was performed and a specimen of cerebrospinal fluid was removed which contained 160 mg. of total protein per hundred cubic centimeters and 2 lymphocytes and 2 polymorphonuclear leukocytes per cubic millimeter of cerebrospinal fluid. The initial pressure of the cerebrospinal fluid was 20 cm. of water. The Queckenstedt test could not be performed because trial of it precipitated a paroxysm of coughing referable to the fact that the patient had an infection in the upper part of the respiratory tract and accurate readings could not be taken.

By the time the patient was considered to be in condition for operation (approximately two weeks after admission) both legs were paralyzed. A differential diagnostic spinal puncture was performed in order to localize the lumbar intraspinal lesion, which, because of the history, was suspected of being a protruded intervertebral disk. A spinal puncture needle was introduced into the twelfth thoracic interspace and clear fluid was obtained without evidence of spinal subarachnoid block. Another needle was introduced into the first lumbar interspace, once more with normal results. At the fifth lumbar interspace, yellow fluid was obtained with a complete spinal subarachnoid block. This fluid on examination revealed 1,200 mg. total protein per hundred cubic centimeters of fluid. Laminectomy was then performed under paravertebral anesthesia and a large fragment of a protruded disk was removed at the site of the fourth lumbar interspace.

Two months after this operation there was a marked improvement in the patient's condition. He was able to walk without aid, whereas it had been possible for him to walk only with the aid of crutches on leaving the hospital; and he volunteered the information that his back felt better than it had felt for five years and that there was no pain or soreness in his back or legs.

If the patient is very uncomfortable or is experiencing enough trouble to warrant bed treatment for two weeks, surgical treatment of the lesion should be advised. The surgical treatment consists of the removal of the protruded portion of the involved disk through a laminectomy wound.

CASE 5.—A man aged 35 had felt pain in the back and left leg intermittently for the past twelve years, occasioned by the patient's sustaining an injury. It was alleged that he had suffered fracture of the fourth and fifth lumbar vertebrae. There was no paralysis at the time of injury. The pain was exaggerated by coughing, sneezing and activity. Pain did not disappear during rest. The left achilles tendon reflex was slightly diminished. Roentgenologic examination of the spinal column produced negative results. The cerebrospinal fluid had a total protein content of 60 mg. per hundred cubic centimeters of fluid. Roentgenologic examination with radiopaque oil revealed an extradural defect on the left, opposite the lumbosacral articulation. Laminectomy, with resection of the hypertrophied ligamentum flavum and removal of a large protrusion of the disk between the fifth lumbar and first sacral vertebrae, was done. The patient made an uneventful convalescence. Postoperative neurologic examination yielded negative results. Complete relief of pain was achieved.

This is an operation which should not be undertaken unless the surgeon has had considerable experience with intraspinal surgery. The lesions are at times small and can be overlooked easily. The cauda equina must be handled only with extreme care, and hemostasis must be very accurate or a postoperative hematoma may nullify the relief that should ensue following the removal of the protruded disk.

9. Love, J. G.: Intractable Low Back and Sciatic Pain Due to Protruded Intervertebral Disks: Diagnosis and Treatment, *Minnesota Med.* 21: 832-838 (Dec.) 1938.

If radiopaque oil is used to localize the lesion, it should be injected into the subarachnoid space in the lumbar segment and the roentgenologic examination should be carried out on the day of operation. It has been our experience that injection of radiopaque oil in the presence of a space-occupying intraspinal lesion is much more likely to be followed by an exaggeration of the patient's symptoms than it would be if there were no intraspinal lesion. The larger the lesion, the greater the compression of the subarachnoid structure and the greater the chance for exaggeration of previous symptoms will be. This fact is not surprising, for I have noted that even a diagnostic spinal puncture in the presence of a large intraspinal tumor will result in the development of marked neurologic signs (and even paraplegia) which were not present prior to the withdrawal of cerebrospinal fluid from the region about the tumor.

If a protruded disk has been demonstrated and operation is to follow, the patient should be prepared for laminectomy. If the roentgenologic study with radiopaque oil is negative and if the other signs are not sufficient to warrant an exploratory laminectomy, the patient should be kept in bed overnight and allowed to leave the hospital the next morning, unless he was previously a hospitalized patient receiving other treatment.

Radiopaque oil is, of course, a foreign substance, and it is eliminated very slowly from the subarachnoid space.¹⁰ It should therefore be used only in carefully selected cases. An intraspinal inflammatory lesion is a definite contraindication to its use.

More recently we have employed air¹¹ in the subarachnoid space as an aid to roentgenologic localization of protruded disks (fig. 5 *a* and *b*). When a definite defect can be shown, air is an excellent contrast medium, but the accuracy achieved by this method in our hands has not approached that resulting from the use of radiopaque oil.

The operation for the removal of a protruded disk is laminectomy. The laminectomy should be as short as possible, yet adequate to permit a satisfactory exposure of the protruded disk. The removal of one pair of laminae will ordinarily provide adequate exposure. In many cases I perform what I call a "partial laminectomy" (see fig. 1); that is, a removal of the edges of the laminae above and below the interspace at which the protrusion has occurred. The articular facets always should be preserved. On one occasion I was able to remove a protruded disk without the removal of any bone. Resection of the hypertrophied ligamentum flavum permitted exposure and removal of the underlying protrusion with complete relief of nerve root pressure and the intractable sciatic pain.

CASE 6.—A man aged 54 registered at the clinic Nov. 28, 1938, at which time he came seeking relief of intractable left sciatic pain of four months' duration. He had experienced onset of the pain in July 1938 while on a motor trip. The first symptom to appear was a difficulty in sitting. He noted that he had to rest first on one buttock and then on the other. There was a dull aching pain in the left lower lumbar region, which had become progressively worse. He had been kept in bed for several days in August, and he began to limp in September. He had discovered that the limp minimized the pain in the back. In October the pain was projected along

the left sciatic nerve. The patient volunteered the information that pain was worse while he was in the sitting position and when he turned in bed. The pain was exaggerated by coughing and sneezing. The usual conservative treatment had failed to give relief.

Examination disclosed that the patient walked with a distinct left-sided limp. There was tenderness over the lumbosacral articulation and along the left sciatic nerve. The straight leg-raising test for the left extremity gave a positive reaction. The left achilles tendon reflex was somewhat diminished over that of the right. Roentgenologic examination of the spine disclosed a partial sacralization of the fifth lumbar vertebra with a definite narrowing of the fourth lumbar interspace. A spinal puncture by the patient's local physician had revealed a total protein content of 60 mg. per hundred cubic centimeters of cerebrospinal fluid. A combined diagnostic lumbar puncture and spinogram (air injection into the spinal subarachnoid space) were made at the clinic. After introduction of the lumbar puncture needle into the first lumbar interspace the air was injected under slight pressure, and 45 cc. of air was used to replace 40 cc. of fluid. When the fluid in the lumbar sac had been displaced by air, roentgenograms disclosed a left antero-lateral defect opposite the fourth lumbar space. A diagnosis of protruded intervertebral disk was made and operation was advised.

December 1 a classic protrusion of the fourth lumbar disk was removed without the performance of laminectomy. The

operation was planned as a left hemilaminectomy, but when the fourth interspace was exposed the

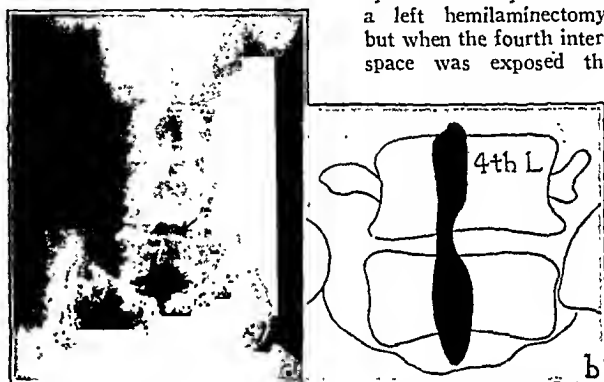


Fig. 5.—*a*, Anteroposterior view of the lumbar portion of the spinal column after the cerebrospinal fluid had been replaced with air. The point of the arrow indicates the defect in the air column caused by a protruded intervertebral disk; *b*, drawing to indicate the defect seen in the roentgenogram.

ligamentum flavum was found to be unusually thick. When the left half of the ligament was resected characteristic edema of the underlying nerve root, with posterior displacement such as is seen with an underlying protrusion of the disk, was noted (see fig. 4). The involved nerve root was retracted and a large fragment of fibrocartilage was removed from the disk. This operation relieved the cauda equina of pressure and the wound was closed without removal of any bone.

POSTOPERATIVE TREATMENT

The care of patients on whom laminectomy has been performed for the removal of a disk protrusion has gradually evolved into a very simple system. Since but little bone is removed and since the incision in the skin and fascia is short and the heavy erector spinae muscles are reflected subperiosteally, there is little that could have an adverse effect on such a wound if an accurate anatomic closure has been effected. As has been stated, no bone grafting or fusing is done, therefore there is no need for splinting, casting or even keeping the patient quiet in bed. Instead, these patients are left to their own inclinations, so to speak, when they are placed in their beds after leaving the operating room, and they are encouraged to move their toes, feet and legs as soon as they recover from the effects protruded disk had completely perforated the liga-

10. Walsh, M. N., and Love, J. G.: Meningeal Response Following Subarachnoid Injection of Iodized Oil, *Proc. Staff Meet., Mayo Clin.* 13: 792-796 (Dec. 14) 1938.

11. Young, B. R., and Scott, Michael: Air Myelography: The Substitution of Air for Lipiodol in Roentgen Visualization of Tumors and Other Structures in the Spinal Canal, *Am. J. Roentgenol.* 39: 187-192 (Feb.) 1938.

of anesthesia. After every laminectomy the ability of the patient to move his toes should be observed and charted frequently during the first six hours after operation. After that his power should be determined several times a day for the first few days. If there is weakness that was not present prior to operation, hemorrhage should be suspected and the wound should be opened to exclude such a possibility. We have encountered only one postoperative hemorrhage in 300 laminectomies performed for the condition of protruded intervertebral disk. There has been one postoperative death in the series.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. SPURLING AND BRADFORD, DRs.
CHAMBERLAIN AND YOUNG, DR. CAMP
AND DR. LOVE

DR. WILLIAM JASON MIXTER, Boston: I will accept Dr. Love's change in nomenclature. The term "ruptured intervertebral disk" was used at first because it was not realized that in some of these cases the annulus was not ruptured but was protruded without being ruptured. I must disagree with Drs. Spurling and Bradford and say that the annulus is involved in the process as well as the nucleus pulposus, and so the term "extrusion of the nucleus pulposus" is not a good one. The differentiation between the fourth and the fifth disk, in my hands, has been rather more difficult than Dr. Spurling has indicated. I agree that air will show a certain percentage of extrusions. I doubt whether it will show small defects which will be shown by iodized oil; I doubt whether it will show some of the larger and more diffuse defects which will be shown by iodized oil. Air can be used in a certain number of cases which lie on the borderline in which one would not be willing to use iodized oil. If one gets a positive effect with the injection of air iodized oil is unnecessary, the dural sac will not have to be opened and it will make the surgeon's job a shorter and an easier one. But I am afraid that one has to admit a considerable percentage of error on the negative side. I believe that one is justified, as both Dr. Love and Dr. Spurling said, in operating in a certain number of cases in which there are classic signs without the use of a contrast medium. The greatest difficulty is in cases in which the signs are not classic, and here I come to the point that there are many patients with low back pain, possibly with sciatica, who should not under any circumstances have iodized oil injected because, as Dr. Love has already stated, a very large percentage of patients with sciatica and low back pain will recover spontaneously. It is only by picking out severe, intractable cases extending over months that one can eliminate the promiscuous and pernicious use of iodized oil in the spinal canal. The use of iodized oil in the spinal canal should be carried out only in the clinic when the patient is to be operated on. It is unfair to the roentgenologist who will have to examine that patient in the operative clinic, and it is unfair to the surgeon who is going to operate on the patient to use iodized oil, run it around in the spinal canal and then send the patient down to the ultimate operative clinic. One does not like to use iodized oil if one can help it, but the subject was developed on the basis of the use of iodized oil. We never would have gotten anywhere with protrusion of the intervertebral disk except by the use of that drug.

DR. CLAUDE MOORE, Washington, D. C.: As Dr. Mixter said, it is not fair to throw the burden of the responsibility of the diagnosis on the roentgenologist without definite indications. I would like to call attention again to the very definite and clear-cut pathologic changes demonstrated on the films shown by Dr. Camp and Dr. Love using iodized oil as compared with those of Drs. Chamberlain and Young using air. I admit that the use of air is an excellent preliminary procedure, but when the patient is going on to neurosurgery the added risk of iodized oil and colloidal thorium dioxide injected into the spinal canal is only slight compared to a major neurosurgical operation.

DR. L. H. GARLAND, San Francisco: Dr. Chamberlain has again demonstrated the value of air myelography in the diagnosis of large space-occupying lesions of the spinal canal (especially with thin patients and perfect radiographic technic), and

Dr. Camp has pointed out the usefulness of the lateral projection for the diagnosis of hypertrophy of the ligamentum flavum. In my experience at the San Francisco Hospital I have found satisfactory diagnostic results with air in only about one tenth of the cases; in the remainder, iodized oil had to be used, either because preliminary air films were inconclusive or because the patient was so thick that we did not deem it advisable to use air. Now, Dr. Chamberlain uses air because he thinks that iodized oil, if left in the cerebrospinal system, may produce late, harmful changes. Dr. Mixter stated that if it gets into the skull it may produce intractable headaches. It seems to me that neither of these opinions is correct. We have made careful x-ray and clinical follow-up studies of twenty-five patients who had iodized oil injected into the spinal canals from one to fourteen years prior to the check-up, in amounts varying from 2 to 5 cc. (and in one remarkable case 10 cc.). In not one of these twenty-five cases is there any subjective or objective evidence to indicate damage to the central nervous system. We did an autopsy on one patient; it revealed the usual leptomeningeal thickening about some of the collections of iodized oil but absolutely no neural tissue changes. About two thirds of the patients had small intracranial collections of iodized oil in and about the basal cisternae without having any headache or other symptoms. As long as the roentgenologist or clinician knows that this intracranial oil is asymptomatic, and apparently harmless, he will not be disturbed by finding it. I do not advocate the indiscriminate intraspinal injections of any substance, gaseous or oleaginous, but I do believe that, in selected cases, the use of small amounts of fresh iodized oil is harmless. Its diagnostic value is far greater than that of air.

DR. J. DANIEL WILLEMS, Chicago: The general tone of conservatism of these papers has been gratifying. I am in a different position from the speakers; I am placed in somewhat of a referee position. These patients come to me after they have been operated on. I cannot talk in figures of 300 but I have several dozen by this time, patients who have been operated on in some of the best clinics in this country; they come back to me with all sorts of complications, weeks later and months later. Most of them are workmen; they should return to work, and I cannot for the life of me get them back to work. Of all the complications, the worst is the presence of iodized oil as shown by the x-ray film. I would make a plea for conservatism, especially in the use of iodized oil such as can be shown in x-ray films later.

DR. R. GLEN SPURLING, Louisville, Ky.: I proposed on two occasions before this Association the use of iodized oil for diagnosis of these intraspinal lesions, and I have used it without any fear of dangerous reaction or permanent disabling effects. However, I have always had more or less difficulty convincing orthopedic surgeons and others that iodized oil is an innocuous substance, and we know it is not entirely innocuous because after the immediate reactions there is always inflammation. I had this brought to my mind forcibly three months ago by a doctor who saw a relative of his with one of these lesions. I told him that I felt reasonably sure that there was a herniated nucleus pulposus at the fifth lumbar interspace. He said "You can operate, but you can't inject lipiodol." I think that represents the attitude of many in the profession regarding this drug, and if that argument could be eliminated from the whole picture of disease of the intervertebral disk some progress in the final solution of the problem would have been made. I do believe that with more mature consideration of the neurologic aspects, both subjective and objective, we can arrive at a definite, accurate diagnosis in a large percentage of cases that require surgery. I do not doubt that there are many acute cases in which localization cannot be made, but in my opinion most of these patients should not be treated surgically. It is only intractable cases that require surgery, of which I was speaking in my paper. As regards the terminology, I believe that in those cases in which there is a frank mass present beneath the posterior longitudinal ligament it is usually composed chiefly of nuclear material with fragments of annulus fibrosus attached to it. Our surgical specimens have been carefully examined grossly and histologically, and they have shown predominantly nucleus pulposus. Furthermore, when we remove one of these masses and inspect

the operative site carefully we see that the protrusion is immediately relieved, that the gaping edges of the posterior longitudinal ligament fall back together, and there is very little to tell the story of the former disruption. That, to me, is further argument that the presenting lesion is composed chiefly of nuclear material. Furthermore, that would bear out our conception of the symptomatology, since we feel that the low back pain is due to stimulation of the sensory nerve endings supplied by the recurrent branches of those nerves, and the root pain is due to a pressing mass beneath or outside the posterior longitudinal ligament which has impinged on one of the nerves at its point of fixation.

DR. W. EDWARD CHAMBERLAIN, Philadelphia: Our use of oxygen instead of air as the contrast medium for myelography is due entirely to the fact that oxygen disappears from the lumbocaudal sac (is absorbed) more rapidly than air. After the use of air the patient's sacrum must be kept higher than the foramen magnum for at least twenty-four hours, whereas after the introduction of oxygen, three or four hours of the special posture seems to suffice. However, Dr. Adson called my attention yesterday to an effective way of hastening the absorption of ordinary air. He simply has his patient breathe pure oxygen through the new Loveless mask. This reduces the nitrogen tension in the blood and brings the rate of absorption of ordinary air up to about that of oxygen. I wish to commend Dr. Spurling for his emphasis on the clinical neurologic study. There has been too much emphasis on studies with contrast mediums to the exclusion of clinical methods of examination. Just as too many radiologists have adopted the attitude that oxygen myelography is too difficult and iodized oil cannot be supplanted, too many clinicians have adopted a defeatist attitude toward the neurologic examination. In our many contacts with Dr. Fay and his associates in the Department of Neurology and Neurosurgery at Temple, we have learned to appreciate the value of the clinical neurologic examination as stressed by Dr. Spurling. When these intervertebral disk protrusions were first recognized, I think most of us took it for granted that symptoms from such a cause could be relied on to be either progressive or at least constant. But now we know that, as stressed by Dr. Mixter and again by Dr. Love, 80 per cent of patients with disk lesions manifest a distinctly intermittent symptomatology. This intermittent feature has aroused our special interest, for it is so marked as to suggest that the mechanical factor, the actual disk protrusion itself, must also be intermittent. That this may be the case is suggested by our recent demonstration, in quite a series of cases, that flexion of the spine tends to "withdraw" disk material from the spinal canal, while extension tends to produce or emphasize protrusion. In one of our surgical cases Dr. Fay demonstrated, on the operating table, this "withdrawal" and recurrence of the disk protrusion with flexion and extension of the spine.

DR. JOHN D. CAMP, Rochester, Minn.: I do not believe that any of the substances that have been talked about today are ideal substances for this work. Sooner or later somebody is going to perfect a radiopaque substance which can be injected into the subarachnoid space and be eliminated rather rapidly by the spinal fluid. When that time comes I feel that roentgenology will have added another great step forward in the study of many neurologic conditions.

DR. J. GRAFTON LOVE, Rochester, Minn.: Dr. Mixter has warned about the injection of iodized oil, and we have adopted the attitude. We have stopped injecting iodized oil for diagnostic purposes unless the patient has already planned—if the study is positive—to proceed with the operation, preferably the same morning. The injection is made in the operating room, Dr. Camp does his fluoroscopy, then the patient is taken back to the operating room and a laminectomy is performed. Walsh and I have collected, at the time of laminectomy, a number of specimens of fluid, and we have been able to show that there is an increase in lymphocytes following injection. They reach their height within one or two hours and subside in from twenty-four to forty-eight hours, and the iodized oil, if removed immediately, appears as it did when it came out of the ampule, whereas if it is removed the next day it has the appearance of clabber or sour milk, and it is during that period that there

are irritating properties to the iodized oil, and if there is a nerve compressed the symptoms are apt to be more marked. The same thing is seen in spinal tumor; the symptoms may be remarkably exaggerated following removal of a sample of fluid. So if there is an intraspinal injection, operation should not be delayed. In some of my earliest cases I purposely left the iodized oil in and did not open the dural sac because of the marked extradural bleeding which sometimes occurs. Some of my first cases were so troublesome that I wanted to maintain the hydrostatic effect in the caudal dural sac. Certainly, the large number of patients who had been chronic invalids and had been incapacitated for any type of work and who were relieved by laminectomy and were out in a short time following use of iodized oil is some proof. The patients we deal with are incapacitated, patients who have been in bed for six months, patients who have had various operations, who have had bone grafts, who have had manipulations under anesthesia, who have been in bilateral spica casts for three to six months. A protrusion of the fourth lumbar disk cannot be differentiated from a protrusion of the fifth disk. One can show a protrusion of any of the lumbar disks with the same clinical and neurologic manifestations. There is an important point about the intermittence of symptoms that has intrigued all of us. Why will these patients get relief? my orthopedic colleagues ask me. In the past, we have brought about fusion in some of these cases, seeing the number of protruded intervertebral disks. It is my feeling that, if the protrusion is at the lumbar sacral disk and a massive bone graft is applied, the patient may be cured. If a sacro-iliac joint is fused it would have no effect on the patient. I think that as time goes on some of these patients cure themselves, the edema subsides and the tissue contracts, because this is not neoplastic.

THE EFFECTS OF OBSTETRIC ANALGESIA ON THE NEWBORN INFANT

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AND

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The effect of obstetric analgesia on the newborn infant has been the subject of considerable discussion during the past few years both in medical literature

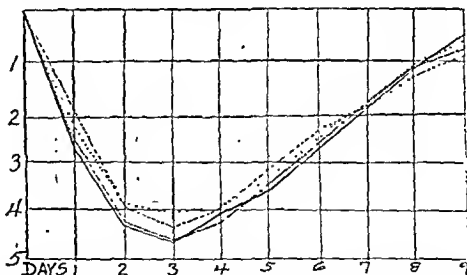


Chart 1.—Average weight in complete series: solid line normal, dotted line McCormick modification of Gwathmey technic, dashes paraldehyde, dots and dashes pentobarbital sodium.

and in the lay press. Analgesia has been accused of depressing the vital functions during the first few days of life, of causing permanent damage to the cerebral centers and of increasing fetal mortality.

Since obstetric analgesia is becoming so widely used, it is important to determine whether such is the case.

From the Department of Obstetrics and Gynecology, George Washington University School of Medicine.

Read before the Section on Obstetrics and Gynecology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

The group in which the McCormick technic of analgesia was used is presented through the courtesy of Dr. Prentiss Wilson, Washington, D. C.

A comparative study of large groups of newborn infants under the same environmental conditions, some of whose mothers received analgesia while those of others did not, would appear to be the logical method of approach to this problem. If obstetric analgesia is harmful to the infant, it should be reflected in the mortality rate

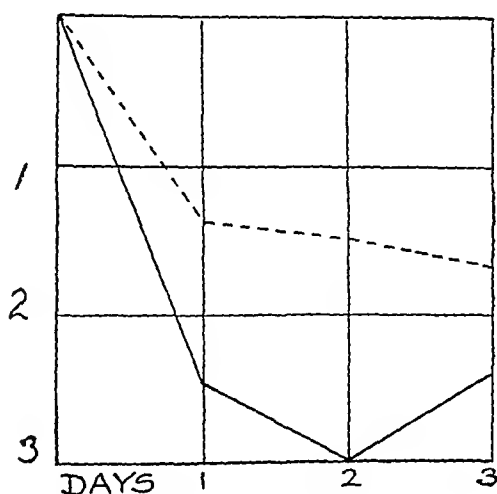


Chart 2.—Average weight in paired series: solid line normal, broken line paraldehyde.

and the records of the vital functions during the first ten days of life. We have completed such a study and herewith submit a summary of our observations.

METHODS

Eight hundred consecutive babies born of mothers delivered by the vaginal route in private practice were selected for this study; in 500 instances the mother received paraldehyde either alone or in combination with some other drug, in 100 instances she was treated by the McCormick modification of the Gwathmey technic and in 100 she received pentobarbital sodium and scopolamine. The babies of 100 mothers who received no analgesia were used as controls.

In these groups the following factors were studied: (1) the mortality rate, (2) the initial loss of weight, (3) the rate of gain for the first ten days of life, (4) the temperature curve for the first ten days of life and (5) the pulse and respiration curve for the first ten

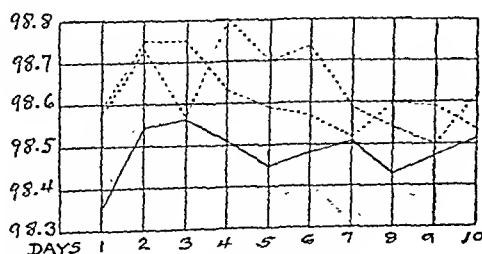


Chart 3.—Average temperature in complete series: lines as in chart 1.

days of life. Also due consideration was given to the duration of labor, the type of delivery, the dosage of the analgesia used and its effect on the subsequent clinical course of the infants after birth.

One hundred additional cases were selected for a more detailed study. In fifty the mother received paraldehyde analgesia. In each of these cases the infant was matched with another child, born on the same day and of approximately the same birth weight but whose mother received no analgesia. The two babies were

fed identical formulas and the environmental conditions were the same. In these cases the temperature, pulse and respiratory rates were recorded every four hours and the weight was checked twice a day for the first three days of life.

The time interval between delivery and the initial respiration was checked with a stopwatch on 100 paraldehyde babies and 100 control babies.

Dosage of Analgesia.—The average dosage of paraldehyde was 17.5 drachms (66 cc.) given with an average of $1\frac{1}{60}$ grain (0.012 Gm.) of morphine sulfate. The usual initial dose was from 6 to 8 drachms (23 to 31 cc.) of paraldehyde by rectum and one sixth or one fourth grain (0.011 or 0.016 Gm.) of morphine hypodermically, the paraldehyde being repeated in 3 or 4 drachm (12 or 15.5 cc.) doses as often as necessary. The largest total dose given was 38 drachms (142.5 cc.) of paraldehyde and one fourth grain of morphine. It is apparent and we wish to emphasize the fact that in this series of cases large doses of analgesia were used. If analgesia has an effect on the child, such effects would certainly be demonstrable in this group.

In the group of mothers treated by the McCormick technic, the average amount given was 1.53 doses of the mixture and 4.99 grains (0.32 Gm.) of pentobarbital sodium.

In the group receiving pentobarbital sodium and scopolamine the average total dose was 6.78 grains (0.44 Gm.) of pentobarbital sodium and $\frac{1}{200}$ grain (0.0003 Gm.) of scopolamine.

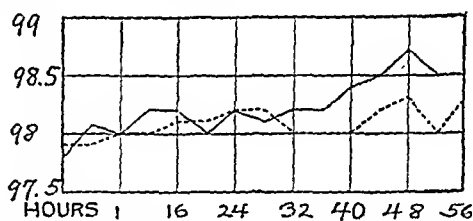


Chart 4.—Average temperature in paired series: solid line normal, broken line paraldehyde.

RESULTS

Duration of Labor.—The average duration of labor in this series of cases was seventeen and one-half hours for primiparas and thirteen and one-half hours for multiparas. This is corroborative of the observations made by Rosenfield and Davidoff,¹ Colvin and Bartholomew² and Kane and Roth³ and definitely demonstrates that labor is not prolonged by the use of any of these types of analgesia.

Incidence of Operative Delivery.—It has long been recognized that any factor which increases the incidence of operative delivery adds to the fetal risk. The type of delivery in the various series of cases is summarized in table 1. The high incidence of forceps is due to the fact that we use prophylactic forceps as a routine and do not consider it an increase in operative intervention.

Effect of Analgesia on Fetal Mortality Rate.—In the 500 cases in which paraldehyde analgesia had been given there were eleven fetal or neonatal deaths. This represents a gross mortality rate of 2.2 per cent. Table 2

1. Rosenfield, H. H., and Davidoff, R. B.: Paraldehyde as a Factor in Painless Labor, Surg., Gynec. & Obst. 60: 235-238 (Feb.) 1935.
2. Colvin, E. D., and Bartholomew, R. A.: Advantages of Paraldehyde and Basic Amnesic Agent in Obstetrics, J. A. M. A. 104: 362-367 (Feb. 2) 1935.
3. Kane, H. F., and Roth, G. B.: Use of Paraldehyde in Obtaining Obstetric Analgesia and Amnesia, Am. J. Obst. & Gynec. 29: 366-369 (March) 1935.

lists the cause of death in the individual cases. There were seven instances in which the cause of death could be ascribed definitely to factors other than the analgesia. In the remaining four cases death was attributed to atelectasis. Of these four cases, one mother received only 6 drachms (23 cc.) of paraldehyde and another 10 drachms (38.8 cc.). One mother received 34 drachms (127.5 cc.) of paraldehyde and one sixth grain of morphine in a period of forty-four hours. This infant's urine gave a strong reaction for paraldehyde. If one considers these four deaths to be due to the

TABLE 1.—Types of Delivery

	Normal	Paraldehyde	McCormick	Pentobarbital Sodium
Low forceps.....	2%	81.4%	21%	87.5%
Midforceps.....	1%	10.3%	3%	4.0%
Breech.....	3%	3.3%	5%	8.0%
Version extraction.....	0	0.5%	1%	0
Spontaneous.....	94%	4.5%	70%	4.0%

paraldehyde, the fetal mortality rate from the drug is 0.8 per cent. Adair states that in many stillbirths there is no demonstrable lesion at autopsy other than atelectasis. Dr. Choisser,⁴ pathologist of the George Washington Hospital, reports that atelectasis is a common finding in stillbirths but that it is not more frequent in cases in which the mothers have received paraldehyde

ing interval recorded on 100 babies whose mothers received no analgesia. The average intervals in the two groups were 39.5 and 9.8 seconds respectively.

Granting that the initial respiration is slightly delayed, the question still arises "Does this slight delay have any injurious effect on the baby?"

Birth Injuries.—There was only one birth injury in this series of cases: Erb's paralysis developed as the result of traction on the neck exerted to deliver the impacted shoulders. In the follow-up studies of these babies during the past five years there has been no instance of convulsions, mental retardation, spastic paralysis or other evidence of neurologic defects. From these data it seems reasonable to conclude that cerebral injuries in the newborn are due to mechanical factors, usually faulty obstetric manipulation, rather than to the drug given the mother.

MORBIDITY

Pediatricians have repeatedly stated that babies whose mothers are given analgesia during labor are sluggish and drowsy for the first three or four days of life and that they fail to nurse properly and therefore lose more weight and become more dehydrated than babies whose mothers receive no analgesia. This has not been our experience, as the following data will show:

Weight.—The average daily weight changes of the 489 babies whose mothers had paraldehyde, the ninety-

TABLE 2.—Cases of Fetal Death

Case	Dose of Analgesia			Type of Delivery	Weight		Time of Death	Maturity	Autopsy Results
	Duration of Labor, Hours	Paraldehyde, Drachms	Morphine hyde, Sulfate, Grain		Pounds	Ounces			
1	4	12	¼	Breech	2	2	24 hr. post partum	6½ months	Premature
2	..	..	..	Spontaneous	2	0	24 hr. post partum	6½ months	Premature
3	50	26	..	Low forceps	3	12	3d day	7½ months	Anencephalle
4	12	21	..	Low forceps	7	6	24 hr. post partum	Full term	Congenital, hydro-nephrosis, broneho-pneumonia
5	16	14	¼	Breech extraction, forceps to after coming head	4	9	24 hr. post partum	8½ months	Tentorial tear
6	16	9	¼	Breech extraction, forceps to after coming head	6	3	Stillbirth	Full term	Tentorial tear
7	12	14	¼	Low forceps	4	2	Stillbirth	8 months	Congenital fetal edema, erythroblastosis
8	8	10	¼	Low forceps	6	5	24 hr. post partum	Full term	Atelectasis
9	4	6	¼	Low forceps	4	13	24 hr. post partum	8½ months	Atelectasis
10	20	28	¼	Low forceps	5	1	14 hr. post partum	8 months	Premature
11	44	34	¼	Low forceps	8	0	Stillbirth	Full term	Asphyxia, urine positive for paraldehyde

than in those in which no analgesia was given. We can conclude only that the paraldehyde may or may not have been the cause of death, but we feel that in any group as large as this a like percentage of babies will die from atelectasis or unknown causes resulting in atelectasis, regardless of whether analgesia was used or not.

In the group of McCormick babies there were two deaths, representing a gross mortality rate of 2 per cent. One of these babies had hydrocephalus and the other was premature with atelectasis.

In the pentobarbital sodium group there was one neonatal death of a baby with exomphalos, giving a gross mortality of 1 per cent and a corrected mortality of 0.

THE EFFECT OF ANALGESIA ON INITIAL RESPIRATION OF INFANT

In 100 cases in the paraldehyde group the interval between delivery and onset of respiration was determined by a stopwatch and compared to the correspond-

eight babies whose mothers were treated by the McCormick technic and the 100 babies whose mothers had no analgesia are shown in chart 1. The maximum loss of weight was reached on the third day in all groups. Thereafter all the babies gained steadily and at approxi-

TABLE 3.—Percentage of Babies with Temperatures Over 100 F.

	Day Post Partum									
	1st	2d	3d	4th	5th	6th	7th	8th	9th	10th
Normal.....	2	4	4	5	2	2	1	0	1	0
Paraldehyde.....	1.4	2.2	3.6	1.6	1.8	1.4	1	0.4	0.2	0.4
McCormick.....	1	4	2	4	1	1	1	1	1	1
Pentobarbital sodium.....	1	8.3	4.1	8.3	8.3	8.3	2	4.1	4.1	1

mately the same rate. The average total loss of weight on the third day was 4.5 ounces (128 Gm.) in the paraldehyde group, 4.1 ounces (116 Gm.) in the McCormick group and 4.7 ounces (133 Gm.) in the control group. We were surprised to find that the control babies lost more weight than those whose mothers had

4. Choisser, Roger: Personal communication to the authors.

received analgesia. Recently Cole⁵ has published similar observations.

The average daily change of weight of the fifty pairs of babies is shown in chart 2. The average total loss at the end of three days was 1.9 ounces (54 Gm.) in the paraldehyde group and 2.5 ounces (71 Gm.) in the control series. Here again the greater loss of weight of the group without analgesia is striking. Cole believes that this increased loss of weight of the group of spontaneous deliveries without analgesia is due to increased trauma to the fetal head, which causes shock.

TEMPERATURE, PULSE AND RESPIRATION

The average daily temperature of the four series of cases is represented in chart 3. There is no significant difference between the group whose mothers received analgesia and those whose mothers did not.

It is often stated that analgesia results indirectly in dehydration of the infant owing to its disinclination to take fluids. Dehydration is usually accompanied by an elevation in temperature. Analysis of the series of cases reveals that the percentage of babies whose temperature

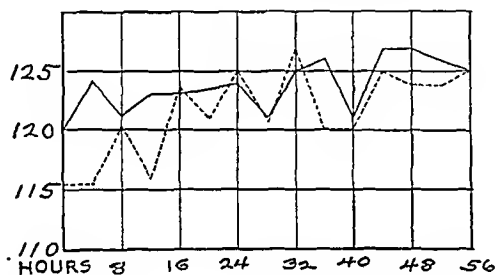


Chart 5.—Average pulse rate in paired series: solid line normal, broken line paraldehyde.

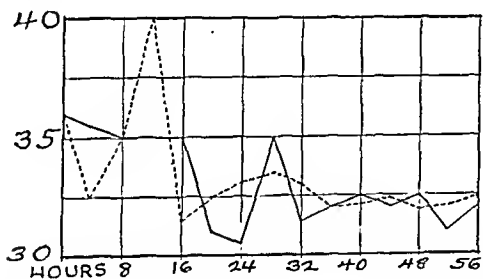


Chart 6.—Average respiration rate in paired series: solid line normal, broken line paraldehyde.

rose above 100 F. (table 3) was less in the paraldehyde and McCormick groups than in the control series. The largest percentage of babies with elevation of temperature above 100 F. was in the pentobarbital sodium group.

The average daily temperature (chart 4), pulse (chart 5) and respiration rates (chart 6) of the paired series of paraldehyde and control babies showed no significant difference. The temperature ranged between 97.8 and 98.7 F., the pulse rate between 115 and 127 and the respiratory rate between 30 and 40 in the two groups.

In these paired babies the nursing personnel was unable to note any significant differences between the group in appetite, food consumption, degree of dehydration or attitude except that the babies whose mothers had had analgesia were slightly more drowsy for the first twenty-four hours.

5. Cole, W. C. C.: Obstetrical Influences on the Weight Curve of the Newborn, *Surg., Gynec. & Obst.* 68: 179-186 (Feb.) 1939.

CONCLUSIONS

Obstetric analgesia, properly administered, does not increase the infant mortality or morbidity rates above those which occur in a series of infants whose mothers were delivered without analgesia.

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ETIOLOGIC FACTORS IN NEONATAL ASPHYXIA

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DETROIT

Asphyxia of the newborn infant has assumed an entirely new significance in recent years for two reasons: a greatly modified conception of the inauguration of respiration and the demonstration of the various pathologic changes that may be produced in the central nervous system by anoxia. Until very recently it had always been supposed that the normal baby was born in a state of physiologic apnea and that as the placental circulation ceased to function the accumulation of carbon dioxide in the blood stimulated the respiratory center and caused respiration to begin.

The studies of Snyder and Rosenfeld¹ have caused us to change this conception almost completely. They have shown beyond much question of doubt that the movements of respiration do not start suddenly at the time of birth but occur in regular rhythm during the latter third of intra-uterine life. According to them there is little essential difference between intra-uterine and extra-uterine breathing except that amniotic fluid instead of air enters the lungs in the former and that of course gaseous exchange does not take place. Moreover, once these movements are established they are continuous and not interrupted unless some profound influence is exerted on the fetus. If this conception is correct, the normal infant should take its first extra-uterine breath within a very few seconds after delivery, and a new importance attaches to the baby that is not breathing at birth. It means that any baby who does not breathe within at the most thirty seconds after delivery must be profoundly affected by something, whether it is strangulation, anesthesia, narcosis, or shock as a result of the trauma of labor.

Of even greater importance, however, than this changed conception of the inauguration of respiration has been the demonstration of the devastating pathologic changes produced in the central nervous system when it is deprived of an adequate supply of oxygen for even short periods of time. Yant and his co-workers² have shown experimentally that the cells of the brain are much more sensitive to oxygen want than most of the other cells of the body and that one minute of complete lack of oxygen may be sufficient to cause their death. Courville³ has described similar changes following nitrous oxide asphyxia and in the newborn.

From the Woman's Hospital.

Read before the Section on Obstetrics and Gynecology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Snyder, F. F., and Rosenfeld, Morris: Intra-Uterine Respiratory Movements of the Human Fetus, *J. A. M. A.* 108: 1946-1948 (June 5) 1937.

2. Yant, W. P.; Chornyak, John; Schrenk, H. H.; Patty, F. A., and Sayers, R. R.: *Pub. Health Bull.* 211, August 1934.

3. Courville, C. B.: Asphyxia as a Consequence of Nitrous Oxide Anesthesia, *Medicine* 15: 129 (May) 1936.

Extensive areas of "devastation necrosis" have been observed in the brains of infants dying a few days after severe asphyxia at birth which are apparently identical with those observed in death from known anoxic states such as nitrous oxide anesthesia, acute alcoholic intoxication and hyperpyrexia. Schreiber⁴ has emphatically brought to our attention the relationship of asphyxia at birth to serious degenerative changes in the brains of older children and has suggested that in many cases excessive sedation of the mother may be the causative factor.

Schreiber's contention that these serious changes are the result of anoxia, frequently resulting from sedatives given to the mother, places a tremendous responsibility on obstetricians who administer such drugs and pediatricians who care for infants after delivery. If it is true that severe degrees of anoxia produce these severe devastating lesions, then is it not possible that lesser degrees of anoxia will produce lesser lesions? It opens

factors which might produce asphyxia were evaluated. Accordingly, we have reviewed the records of 5,000 mothers and babies delivered at the Woman's Hospital in Detroit during the years 1936 and 1937. The data were tabulated according to the punch card method, which permits the recording of a large amount of data in such a way that they may be accurately cross analyzed in any desired combination of circumstances.

The material at the Woman's Hospital is particularly well adapted to this type of study because 55 per cent of the patients were delivered by general practitioners, 33 per cent were delivered by obstetric specialists and 12 per cent were delivered by the resident staff. This provides for a wide variety of methods and skills. Moreover, all social groups and nationalities are well represented.

TABLE 1.—Incidence of Asphyxia in Entire Series

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Entire series.....	5,000	1.9	9.4	6.5	9.2	72.8

TABLE 2.—Immaturity as Factor in Asphyxia

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Prematures and twins	392	14.5	20.7	10.2	6.6	48.0
Full term.....	4,608	0.8	8.5	6.2	9.5	75.0

TABLE 3.—Incidence of Asphyxia Among Primiparas and Multiparas

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Primiparas.....	2,578	0.7	11.1	7.0	11.2	70.0
Multiparas.....	2,030	0.8	5.2	5.2	7.3	81.8

up a whole new field of speculation with regard to the possible etiology of such conditions as epilepsy, psychopathic personality and lesser degrees of mental inferiority. Certainly the seriousness of these implications calls for an explanation regarding the role of sedatives and anesthetics in the production of neonatal asphyxia and an appraisal of their comparative importance with other factors leading to this state. Certainly asphyxia was a common occurrence before sedatives or anesthetics were ever administered during childbirth. Such factors as prematurity, the age, parity and health of the mother, accidents of labor, the various forms of dystocia, the duration of labor, the use of oxytocics and operative delivery must all be considered.

It occurred to us that a great deal of valuable information might be obtained from the analysis of a large series of deliveries in which as many as possible of the

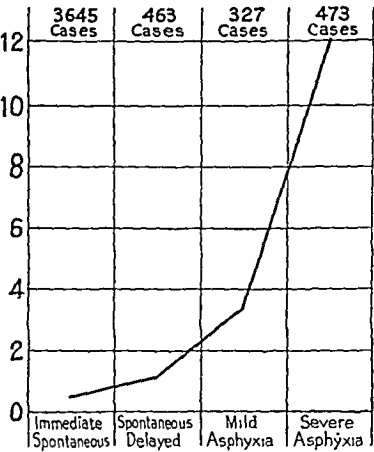


Chart 1.—Neonatal deaths in relation to degree of asphyxia.

SERIES AS A WHOLE

Table 1 shows the incidence of the various degrees of asphyxia in the entire series. It is necessary to state at this point our method of determining the various degrees of asphyxia. Technically, asphyxia is a decrease in the amount of oxygen in the circulating blood and only indirectly associated with the respiratory movements. It is obviously impossible by present methods to determine the oxygen concentration of the infant's blood at the exact moment

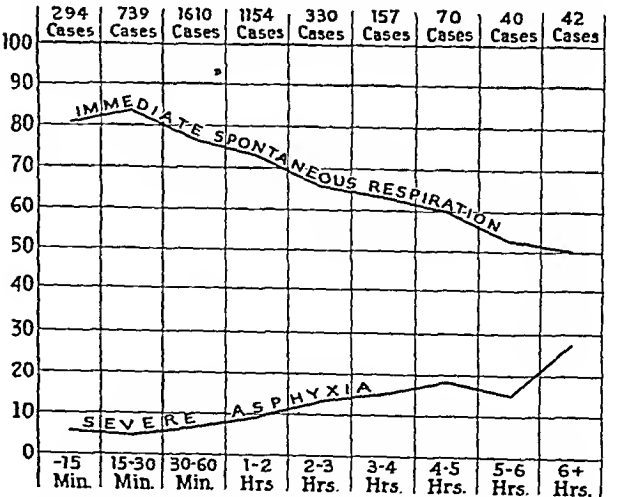


Chart 2.—Relation of cases of immediate spontaneous respiration to those of severe asphyxia when no sedative had been given the mother.

of birth. We chose as the best available criterion the condition of the baby at birth and the duration and amount of resuscitation necessary to establish independent breathing. The methods of resuscitation employed at the Woman's Hospital are the tracheal catheter, car-

4. Schreiber, Frederic: Apnea of the Newborn and Associated Cerebral Injury, J. A. M. A. 111: 1263-1269 (Oct. 1) 1938.

bon dioxide and oxygen inhalations, respiratory stimulants such as coramine and alpha-lobeline, mouth to mouth breathing and artificial respiration. We considered that any baby who required two or more of these methods of resuscitation was severely asphyxiated, particularly when it was noted on the chart that the

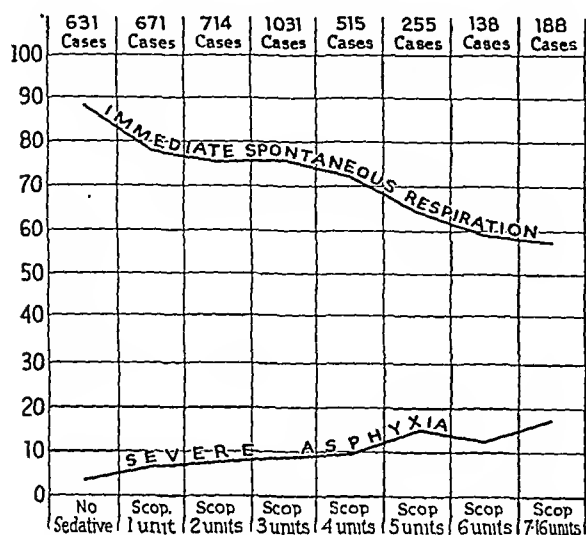


Chart 3.—Effect of scopolamine on respiration of infant.

child was in poor condition for several hours or days after birth. If only one method of resuscitation was employed the baby was classified as mildly asphyxiated. If respiration was spontaneous but delayed for more than thirty seconds the baby was classified as "spontaneous delayed." The stillborn group is obvious.

This method of classification is open to certain errors. One obstetrician might employ more resuscitation than another under similar circumstances, and the reverse

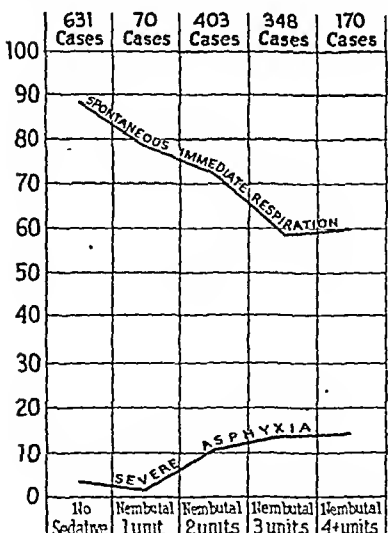


Chart 4.—Effect of pentobarbital sodium on respiration of infant.

before this study was contemplated and accordingly are free from any prejudiced influence by the attending physician or the recording nurse. Furthermore, the relationship of neonatal death to the degree of asphyxia shown in chart 1 bears out the point that a reasonably accurate method of classification was developed.

During this same period the incidence of stillbirths in the city of Detroit was 2.5 per cent. Otherwise we have no basis of comparison with results in other clinics, as no similar classification has ever been made.

Chart 1 shows the relationship of the degree of asphyxia to neonatal death (during hospital stay). In the "spontaneous immediate" group the rate was 0.5 per cent. In the "spontaneous delayed" group it was

TABLE 4.—Age of Primiparas

	No. of Cases	Percentage			
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous
Under 20 years.....	496	0.4	9.9	5.2	9.6
20-30 years.....	1,805	0.6	11.2	8.0	10.7
30-40 years.....	272	1.8	12.1	3.3	16.9
					65.8

1 per cent, or twice as great. In the "mild asphyxia" group it was 3.5 per cent, or about seven times as great. In the "severe asphyxia" group it was 12.1 per cent, or about twenty-five times as great. This direct relationship is most striking and can hardly help being highly significant.

FETAL FACTORS

The importance of immature development as a factor in asphyxia is shown in table 2. Prematurity undoubtedly is the most important single factor causing stillbirth and severe asphyxia.

The relationship of the size of the baby to the occurrence of asphyxia was studied by dividing the cases into groups for each pound of variation in their birth weight.

The three groups 6-7 pounds, 7-8 pounds and 8-9 pounds, which represent the general average, were essentially the same with about 8 per cent severe asphyxia and 76 per cent spontaneous respiration.

TABLE 5.—Age of Multiparas

	No. of Cases	Percentage			
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous
Under 20 years.....	59	0.0	3.5	6.9	8.6
20-30 years.....	1,193	0.7	4.7	5.1	7.1
30-40 years.....	738	0.7	5.9	5.1	7.7
Over 40 years.....	37	8.1	10.8	8.1	5.4
					70.3

However, the group of the smallest infants, 5-6 pounds, showed 14 per cent severe asphyxia and only 68 per cent spontaneous respiration, while the group made up of the largest, over 9 pounds, showed but 5.5 per cent severe asphyxia and slightly over 80 per cent spontaneous respiration. This gives additional evidence of the importance of mature development in helping to withstand the forces tending to produce asphyxia.

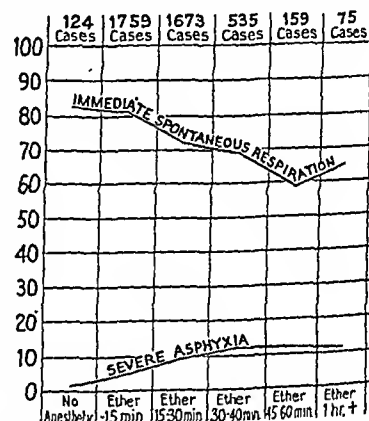


Chart 5.—Effect of ether anesthesia on respiration of infant.

It is important to note that these data were collected from records made before

MATERNAL FACTORS

Certain factors pertaining to the mother show a definite influence on the incidence of asphyxia in the infant: A. *Parity*.—There were 2,578 primiparas and 2,030 multiparas in the series. The incidence of the asphyxia in these two groups is shown in table 3. A decided

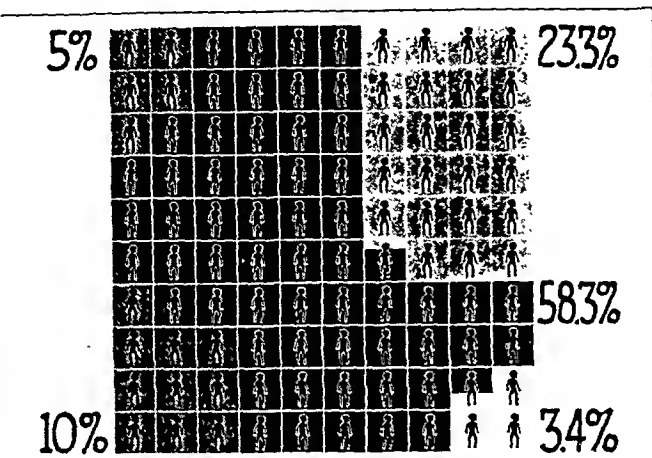


Chart 6.—Elective cesarean section at full term with general anesthesia in sixty cases.

increase in asphyxia in the babies of primiparas is evident.

B. *Age of Mother*.—The relationship between the age of the primiparas and multiparas to the incidence of asphyxia in their babies is shown in tables 4 and 5. Among primiparas, then, the incidence of severe asphyxia increases and spontaneous immediate respiration decreases with each advancing age period. In multiparas the opposite of the situation in primiparas occurs; the incidence of severe asphyxia decreases and immediate spontaneous respiration increases with each advancing age period until after 40, when an extreme reversal sets in. The high percentage of stillbirths by women over 40 is especially worthy of note.

C. *Health of Mother*.—Major illness of the mother is one of the very important factors tending to increase asphyxia in the baby, particularly in the case of premature birth. This is shown in tables 6 and 7.

FACTORS OF LABOR

One of the most important factors in the production of asphyxia is the trauma which the baby sustains from the forces of labor. Table 8 shows the influence of the duration of the second stage of labor. An inspection of this table shows very clearly that, with the exception of the first very short period, there is an increase in the incidence of asphyxia and a decrease in spontaneous immediate respiration with each increase in the duration of the second stage of labor. Chart 2 presents in graphic form this relationship. Severe asphyxia increases from a low of 4.6 per cent to a high of 28.6 per cent, and immediate spontaneous breathing decreases from a high of 84.6 per cent to a low of 50 per cent. It would seem clear that there is a direct relationship between the duration of the second stage of labor and the incidence of asphyxia in the baby. The high incidence of stillbirths in the longest two period groups is worthy of note. The somewhat greater incidence of asphyxia in the very short period group sug-

gests that there is increased trauma to the baby in precipitate deliveries. The same relationship exists between the length of the first stage but in a much less pronounced degree. The trauma exerted on the baby during the first stage of labor is from the contracting uterus as contrasted to the direct trauma to the baby's head, as occurs during the second stage.

It will be shown later that the amount of sedative administered to the mother also has a direct relationship to the incidence of asphyxia. It might be argued that as the duration of labor increases the amount of sedative given also increases and that therefore the results shown in the foregoing tables are produced by the sedatives given rather than by the trauma of labor. In an effort to answer this point, the study was repeated on those mothers who received no sedatives whatever during labor. The result of this study is shown in table 9.

It is evident from a study of these tables that the same relationship obtains as in the preceding series, which included all cases, so that the effect is apparently due to the forces of labor and not to the sedatives.

FACTORS OF DELIVERY

The influence of the type of delivery on the incidence of asphyxia was next studied. If trauma to the infant is a factor in causing asphyxia, the type of delivery should be very important. The various types of delivery were further divided into those with and those without some known type of dystocia. There were 2,660 cases in which delivery was spontaneous. The incidence of asphyxia in this group is shown in table 10. There were 1,151 deliveries by low forceps, as shown in table 11.

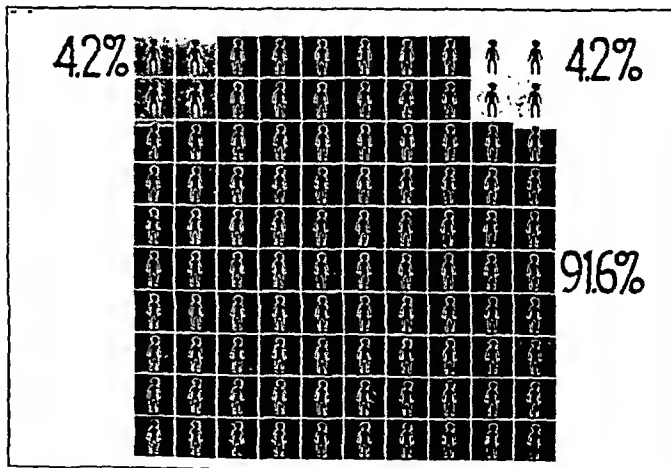


Chart 7.—Elective cesarean section at full term with spinal anesthesia in forty-eight cases.

Asphyxia occurs with considerably greater frequency in low forceps delivery than in spontaneous delivery. However, in most of these cases episiotomy is also performed, which necessitates anesthesia. As will be shown later, this is an important factor and probably accounts for a good deal of the increase in asphyxia in the low forceps group.

There were eighty-seven deliveries by version and extraction, in which group the incidence of asphyxia is extremely high, as shown in table 12.

There were 118 deliveries by breech extraction. The incidence of asphyxia in this group is shown in table 13.

There were 264 cases of other types of operative delivery, mostly mid forceps rotations and the like. The incidence of asphyxia in this group is shown in table 14.

TABLE 6.—*Health of Mother—Premature Birth*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Mother well.....	324	12.3	18.3	9.9	7.4	51.9
Mother ill.....	63	25.0	30.9	11.8	3.0	29.4

TABLE 7.—*Health of Mother—Full Term Birth*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Mother well.....	4,450	0.7	8.2	6.2	9.2	75.3
Mother ill.....	156	2.5	16.6	5.7	10.2	64.7

TABLE 8.—*Relation of Duration of Second Stage of Labor to Degree of Asphyxia*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Less than 15 minutes	294	0.7	5.4	5.1	8.5	80.3
15-30 minutes.....	739	0.7	4.6	5.0	5.6	84.6
30-60 minutes.....	1,610	0.4	6.7	6.6	9.3	77.0
1-2 hours.....	1,154	0.7	9.9	6.6	10.5	73.0
2-3 hours.....	330	0.7	13.3	6.4	13.9	65.8
3-4 hours.....	517	1.9	15.3	5.7	13.4	63.7
4-5 hours.....	70	0.0	18.6	10.0	11.4	60.0
5-6 hours.....	40	7.5	15.0	10.0	15.0	52.5
Over 6 hours.....	42	4.8	28.6	4.8	11.9	50.0

TABLE 9.—*Influence of Duration of Second Stage of Labor of Mothers Receiving No Sedative*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Less than 15 minutes	72	2.8	1.4	1.4	1.4	93.0
15-30 minutes.....	169	0.6	1.8	2.4	2.4	92.9
30-60 minutes.....	277	0.9	1.8	3.5	4.0	90.0
1-2 hours.....	88	2.3	5.8	3.5	3.5	85.0
Over 2 hours.....	22	4.5	...	...	13.6	81.9

A very brief inspection of this series of tables dealing with the type of delivery is sufficient to show what a tremendously important factor this is, especially when associated with dystocia. It serves to emphasize most emphatically that trauma to the infant is of major importance in producing asphyxia.

There were 108 cases of elective cesarean section and sixty-four in which labor had started. In the former the element of trauma is almost completely avoided, but the factors of anesthesia and sedation are not, as will be brought out later. In the latter group some element of trauma is added. The incidence of asphyxia in these two groups is shown in table 15.

SEDATIVE FACTORS

There were 631 mothers who received no sedative whatever during labor. Slightly more than one third of these were primiparas, so that it forms an excellent control group. The incidence of asphyxia in this group is shown in table 16.

The incidence of severe asphyxia is only 3 per cent as compared to 8.6 per cent for the series as a whole, and immediate spontaneous respiration is 88.1 per cent as compared with 75 per cent. This is a very impressive difference.

Morphine.—There were eighty-one mothers who received morphine within four hours of delivery. It has been said that morphine given during this time exerts a marked effect on the baby. There were 147 mothers who received morphine more than four hours before delivery. While the effect is not nearly as striking as in the preceding group, it is still very marked. The incidence of asphyxia in these two groups is shown in table 17.

Scopolamine.—The effect of scopolamine was studied by dividing the cases into groups based on the number of units administered; $\frac{1}{150}$ grain (0.0004 Gm.) was considered as a unit. It should be noted that in the group receiving only 1 unit the incidence of severe asphyxia is twice as great as in the group receiving no sedatives and that immediate spontaneous respiration is 10 per cent less.

TABLE 10.—*Incidence of Asphyxia in Spontaneous Delivery*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
All cases.....	2,660	0.4	4.4	5.2	6.6	83.4
With dystocia.....	359	0.3	5.5	5.5	7.3	81.2
Without dystocia....	2,301	0.3	3.9	5.8	6.4	84.0

TABLE 11.—*Incidence of Asphyxia in Low Forceps Delivery*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
All cases.....	1,151	0.9	10.3	6.3	10.2	72.3
With dystocia.....	125	2.4	16.2	5.2	12.0	64.0
Without dystocia....	1,026	0.7	9.6	6.5	10.0	73.3

TABLE 12.—*Incidence of Asphyxia in Version and Extraction*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
All cases.....	87	4.6	17.2	17.2	24.2	26.5
With dystocia.....	46	5.7	21.7	19.6	19.6	30.4
Without dystocia....	41	0.0	12.2	17.1	26.8	43.9

TABLE 13.—*Incidence of Asphyxia in Breech Extraction*

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
All cases.....	118	0.8	22.0	5.9	24.6	46.6
With dystocia.....	25	4.0	44.0	...	23.0	24.0
Without dystocia....	93	0.0	16.1	7.5	23.7	52.7

Chart 3 shows in graphic form the relationship of severe asphyxia to immediate spontaneous respiration with successively increasing dosage of scopolamine. It will be seen that with each additional dose of the drug the incidence of spontaneous respiration decreases, starting at 88.1 per cent and dropping to 56.9 per cent,

and that likewise the incidence of severe asphyxia increases correspondingly from 3.3 per cent to 18.6 per cent. It should also be pointed out that the number of cases in each of these groups is of such size that all variables should be satisfactorily smoothed out, so

TABLE 14.—Incidence of Asphyxia in Mid Forceps Rotation

	No. of Cases	Percentage				
		Still- born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
All cases.....	264	1.9	22.8	5.3	15.2	54.9
With dystocia.....	158	2.5	29.7	5.7	13.9	48.1
Without dystocia....	107	1.8	12.1	4.7	17.7	63.5

TABLE 15.—Incidence of Asphyxia in Cesarean Section

	No. of Cases	Percentage				
		Still- born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Elective,	108	1.8	15.0	4.7	5.6	72.9
After labor.....	64	1.5	21.5	6.3	12.5	57.8

TABLE 16.—Incidence of Asphyxia in Group in Which Mothers Received No Sedative

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
No sedatives.....	631	1.9	3.0	3.2	3.8	88.1

TABLE 17.—Incidence of Asphyxia in Group in Which Mothers Received Morphine

	No. of Cases	Percentage				
		Still- born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Within 4 hours of delivery.....	81	6.2	34.6	7.0	12.3	38.3
More than 4 hours before delivery....	147	0.0	17.7	8.8	15.6	57.8

that this actually represents a scopolamine effect. In order to answer this point more fully, however, the cases that presented any other known factor which could have contributed to asphyxia were eliminated and the study was repeated in the remaining uncomplicated cases. All cases of operative delivery or of dystocia, all cases in which the second stage of labor lasted more than one hour, all cases in which any other sedative was given in combination with scopolamine, all accidents of labor and all cases in which the mother was not well were excluded. The analysis of this group is shown in table 19. It can readily be seen that the same effect is produced by administering scopolamine when as many as possible of the other contributing factors are eliminated.

Pentobarbital Sodium.—The same procedure was followed in cases in which pentobarbital sodium was given. The unit of pentobarbital sodium was taken as 1½ grains (0.1 Gm.).

Chart 4 shows in graphic form the relationship of severe asphyxia to immediate spontaneous respiration with increasing doses of pentobarbital sodium. It seems evident that pentobarbital sodium has a direct effect in increasing the incidence of asphyxia.

Paraldehyde.—Table 21 shows the incidence of asphyxia in cases in which paraldehyde was given.

ANESTHESIA

Ether.—Cases in which ether anesthesia was given were divided into groups on the basis of the length of time during which ether was administered before the birth of the baby. The results of this study are shown in table 22.

Chart 5 presents in graphic form the relationship of severe asphyxia to immediate spontaneous respiration on a basis of the duration of ether anesthesia. A direct relationship of asphyxia to the amount of ether given is apparent.

TABLE 18.—Incidence of Asphyxia with Scopolamine (1/150 Grain Unit)

	No. of Cases	Percentage				
		Still- born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
No sedative.....	631	1.9	3.0	3.2	3.8	88.1
1 unit.....	671	0.6	6.6	5.8	9.1	78.0
2 units.....	714	1.1	7.3	5.6	11.1	75.1
3 units.....	1,031	0.5	8.5	6.5	8.8	75.7
4 units.....	515	0.8	9.5	7.6	10.1	71.7
5 units.....	235	0.4	15.3	7.1	13.3	63.9
6 units.....	138	0.0	12.3	10.2	18.1	59.4
7-16 units.....	188	0.5	18.6	11.2	12.8	56.9

TABLE 19.—Scopolamine Without Other Factors (1/150 Grain Unit)

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
No sedative.....	631	1.9	3.0	3.2	3.8	88.1
1 unit.....	63	0.0	4.8	4.8	6.4	84.1
2 units.....	64	0.0	9.1	3.1	9.1	78.1
3 units.....	102	0.0	12.7	4.9	5.9	76.5
4 units.....	39	2.5	12.8	2.6	7.7	74.4
5-9 units.....	39	0.0	10.2	7.7	7.7	74.3

TABLE 20.—Pentobarbital Sodium (1½ Grain Unit)

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
No sedative.....	631	1.9	3.0	3.2	3.8	88.1
1 unit.....	70	0.0	1.4	7.1	12.9	78.6
2 units.....	403	0.5	10.2	6.2	10.9	72.2
3 units.....	348	0.0	13.8	18.1	8.9	59.2
4+ units.....	170	1.2	14.7	10.0	14.1	60.0

TABLE 21.—Paraldehyde

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Paraldehyde.....	131	0.0	26.0	10.3	16.0	47.7

Nitrous Oxide.—There were only 240 cases in the series in which nitrous oxide either alone or in combination with ether was given. The incidence of asphyxia in this group is shown in table 23. The small number of cases in this group does not permit of further analysis, but the somewhat higher incidence of asphyxia in this group seems very definite.

Anesthesia in Cesarean Section.—The most striking effect of general ether anesthesia on the baby is shown in cases in which cesarean section was done. There were 108 full term, elective cesarean sections done in this series. Sixty of these were done under general ether anesthesia with a high incidence of severe asphyxia and stillbirths and a very low incidence of spontaneous respiration. Forty-eight sections were done under spinal anesthesia. These two groups of cases are entirely comparable in every way. All factors of labor and delivery are eliminated, so that the striking results shown are clearly due to ether. This is shown graphically in charts 6 and 7. There are 100 babies represented on each chart. The four corners are shaded to indicate the number of babies showing varying degrees of respiratory disturbance. The black squares represent the stillborn babies, the dark gray severe asphyxia, the lighter gray mild asphyxia, the off white spontaneous, delayed respiration and the white spontaneous, immediate respiration.

TABLE 22.—Ether Anesthesia

Duration of Ether Anesthesia	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
None.....	124	1.6	1.6	4.8	8.8	83.0
Less than 15 minutes.....	1,790	0.4	6.0	4.7	7.6	81.2
15-30 minutes.....	1,673	0.4	9.5	7.3	10.9	72.3
30-45 minutes.....	533	1.8	12.7	6.5	9.1	69.7
45-60 minutes.....	159	1.9	12.5	10.1	17.0	58.5
Over 1 hour.....	75	5.3	12.0	4.0	13.3	65.3

TABLE 23.—Nitrous Oxide Anesthesia

	No. of Cases	Percentage				
		Still-born	Severe Asphyxia	Mild Asphyxia	Spontaneous	
					Delayed	Immediate
Nitrous oxide anesthesia.....	240	0.0	14.2	6.6	11.1	67.5

SUMMARY

Five thousand consecutive deliveries at the Woman's Hospital in Detroit have been analyzed with a view of determining the relative importance of the various factors which contribute to the production of asphyxia in the newborn. The maturity of the infant, the age, parity and health of the mother, the duration of the various stages of labor, the type of delivery and the use of sedatives and anesthetics all exert important influences on the incidence of asphyxia. It should be noted that these factors frequently operate in combination.

CONCLUSIONS

1. The most important single factor in the etiology of neonatal asphyxia is prematurity.
2. The next most important factor is the trauma of labor, whether it is the normal forces of normal labor or whether it is accentuated by dystocia and operative delivery.
3. Sedatives in any amount definitely increase the incidence of asphyxia in the baby in direct proportion to the amounts given.
4. General anesthesia in any amount definitely increases the incidence of asphyxia in the baby in direct proportion to the duration of the anesthesia.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. KOTZ AND KAUFMAN AND
DRS. COLE, KIMBALL AND DANIELS

DR. C. O. McCORMICK, Indianapolis: Dr. Cole and his associates in their analyzed study of 5,000 newborn infants verify the relation of each of the several known causative factors of asphyxia and emphasize the underrated influence exerted by analgesia and anesthesia. The benefit of analgesia is no longer directed to the mother alone but to the infant as well. This view is substantiated by another recent study by Dr. Cole, which demonstrated that babies born to analgesized mothers suffer less birth shock and a less and briefer "physiologic" weight loss. However, since Schreiber has indicated the remote effects of prolonged apnea on the fetal brain, every obstetric attendant administering relief for labor pains should feel more keenly his responsibility. Analgesia and anesthesia administered without intelligent regard can be justly criticized. Dr. Cole shows the definite asphyxia-producing power of the old standby inhalation ether; likewise of nitrous oxide, and less so of the barbiturates. From all this comes the necessity of reevaluating our analgesics and anesthetics in labor. The ideal method from the infant's interest must not interfere grossly with the oxygen content of the maternal blood. In this behalf rectal ether oil is to be commended in that the mother receives the usual amount of oxygen at all times, the respiratory rate is unaffected and the respiratory tract is not obstructed by mask or mucus. From the point of view of anoxemia, the best form of an obstetric anesthesia is either ethylene or cyclopropane, preferably the latter, which allows an oxygen content of as much as 80 per cent; or, better still, local or spinal anesthesia. I should like to ask Dr. Cole how he accounts for the lower incidence of the stillbirth rate of 1.9 per cent among his 5,000 cases compared with 2.5 per cent in the city of Detroit, when 88 per cent of his series of patients were delivered under sedation or anesthesia, 55 per cent of whom were handled by the general practitioner? The relationship between duration of second stage labor and the incidence of asphyxia shown by Dr. Cole endorses prophylactic forceps and, in the minds of some, the routine internal podalic version. Dr. Kotz assists us in three ways: 1. He further demonstrates that proper analgesia does not prolong labor, increase incidence of operative delivery or affect infant mortality or morbidity. 2. He contributes additional evidence that proper analgesia lessens birth shock and diminishes initial weight loss. 3. He evaluates three popular and successful methods of analgesia and indicates their respective efficiency. The favorable showing of rectal ether is noteworthy. The incidence of low forceps was only one fourth that of either the paraldehyde or the pentobarbital sodium method, and spontaneous delivery occurred seventeen times as frequently as under either of the two.

DR. FRANKLIN F. SNYDER, Chicago: Because labor itself is by no means a simple process but is complicated often unexpectedly by unforeseen events, the addition of still another factor, namely, the use of narcotic drugs, adds one more element which must be taken into account in the calculation of how normal birth is to be attained. How can one measure the effect of drugs on the fetus, keeping separate this factor from the mechanical trauma of labor? Direct observations of the intra-uterine respiratory movements of the fetus provide an approach to this problem. In an experiment, the rate of fetal respiratory excursions of the rabbit was 30 per minute. Pentobarbital sodium was given to the mother rabbit. Fetal respiratory movements were promptly depressed and finally abolished. The mother, however, showed no such effect, being alert and having normal reflexes. If the fetus were not under direct observation, the striking depression of the respiratory system before birth would not have been detected, in view of the normal appearance of the mother. After inhibition of respiratory movements for an hour the fetus was delivered and breathed actively following birth, thus showing that there was no irreversible damage to the fetus despite the depressant effect. This experiment illustrates that intra-uterine respiration is a sensitive indicator which can detect the earliest effects of narcosis and permit evaluation of the extent to which a narcotic agent affects the fetus. The degree of narcosis may be expressed quantitatively in terms of

change in rate of fetal respiratory movements. Applying this method to compare various drugs used in obstetrics—morphine, paraldehyde, chloral, nitrous oxide, ether—the results show that most anesthetics of both nonvolatile and volatile types suppress intra-uterine respiration long before surgical anesthesia is reached in the mother. On the other hand, results with cyclopropane show that the attainment of one important objective of obstetric anesthesia is not beyond reach, namely the production of full surgical anesthesia of the mother without interruption of fetal respiration.

DR. JOSEPH B. DE LEE, Chicago: I want to talk particularly of the improvement in late infant morbidity. I want to call attention not to the toll of death but to their immediate and postponed sufferings later on in life. Imagine yourself put into a human manikin of appropriate size and driven by *vis a tergo* through the parturient canal. How would you like it? I know you would all demand cesarean section. But that is too dangerous. The milder cerebral injuries show up in the early months of life or in infant life or in late life by the finer macroscopic and even microscopic damage to the brain. Many years ago I used to do all my own postmortem examinations on babies and I noticed the great frequency of minute hemorrhages in the adrenal glands and at the base of the brain, which was sometimes sprinkled with them, and in the basal ganglions. Schreiber of Detroit has proved incontestably that asphyxia causes cerebral damage. Why may not some endocrinopathies seen by obstetricians be due to injuries which the baby suffers at birth? Regarding anesthesia causing asphyxia I think that we had better retrench a little; we have gone entirely too far in relieving the pain of childbirth. I do not mean that we should stop relieving the pain of childbirth but I should like to call a halt in the indiscriminate use of narcotics and anesthetics. I should like to recommend local anesthesia and get the patient's mind and the public mind into the proper receptivity for its widespread use. The damage to the baby's brain is produced not alone by the asphyxia but by the mild and severe traumatism of even normal labor. Let us try to reduce the traumatism of normal labor. The most important villain in increasing the traumatism of the baby's brain is solution of posterior pituitary. Mr. Chairman, I should like to recommend for next year that one whole morning, or possibly two, be devoted to these exclusive subjects: the use and abuse of anesthetics and narcotics in labor, and the use and abuse of solution of posterior pituitary in labor.

DR. L. MASON LYONS, Pierce City, Mo.: It is the duty of the members of our section to evolve unquestionably safe methods and procedures which will be available to and practical for the use of rural physicians. The great majority of babies born in this country are actually born in the country. Dr. McCormick spoke of the lesser danger of using cyclopropane and ethylene. It is impossible for me to take cyclopropane 20 miles into the country. These procedures are not practical in a rural community; neither are they safe when the obstetrician is usually alone or at best is assisted by a single nurse; when the occasion for anesthesia arises they are both too busy to bother with gas machines, rectal preparations and subsequent administration of ether and oil or paraldehyde or anything else. Since the obstetrician is not able to stay out in the country long enough to continue observation after intense narcosis, he should not even attempt their use. It is my experience that the use of barbiturates does narcotize babies. In about 200 recent deliveries I have not given a single dose of any sort of analgesia or any anesthetic. I recognize the use of anesthetics only for an obstetric emergency, and of these I recognize only operative intervention, which may be version and extraction, the necessity of performing and subsequently repairing an episiotomy or something of the sort. Forceps has not been used in my last 192 cases. It has never been taken from the bag. I decry the indiscriminate use of analgesia. If the obstetrician has the confidence of the mother, carefully explains what she must do to assist, talks to her, stands by her, her labor is easier, her pains are more tolerable, her baby is healthier, her labor is quicker and her subsequent course is more normal.

DR. M. S. LEWIS, Nashville, Tenn.: In discussing the effects of analgesia on the newborn one must recognize first that the normal fetus exists in the uterus in a constant state of cyanosis. Cyanosis, then, must be considered the normal state for the

infant at birth and becomes pathologic only if unduly prolonged. Second, it is important to distinguish between asphyxia resulting from the narcotic and that resulting from the hazards of labor. Third, one must recognize that there is extraordinary variability in the manner in which different babies will react to the same drugs. Equally true, all drugs vary widely in the relative degree with which they depress the respiratory tract. In ten years I have observed 2,000 infants born to mothers who had received various analgesics during labor. They were divided into three groups. The first group of mothers received between 12 and 15 grains (0.8 and 1 Gm.) of amytal and 4.3 per cent of the babies were narcotized. The second group received barbiturates and scopolamine, 1 or 2 units, and 15.1 per cent of the babies were narcotized. The third group received morphine and scopolamine and 18.1 per cent of the babies were narcotized. All labors were terminated under nitrous oxide and oxygen. It is hard to understand why there would be any narcosis when a mother received only 1, 2 or 3 grains (0.06, 0.13 or 0.2 Gm.) of amytal, as has been shown here today, when I use an average dose of from 12 to 15 grains and only 4.3 per cent of the babies do not breathe spontaneously. Narcosis of the newborn may be influenced by a number of factors: First, trauma of labor, the size of the dose, the interval between the administration of the analgesia and delivery, and the effects of the drug on the mother. Infants who have been subjected to a long or difficult labor are definitely more susceptible to narcosis from all analgesics administered. This is illustrated in my series: In the operative deliveries 18.3 per cent of the babies were narcotized while in the spontaneous deliveries only 7.1 per cent were narcotized. The operative group did not receive any larger dose than those in the spontaneous group. When operative procedures are anticipated the drugs administered to the mother should be used sparingly and with care, since the infants that have been traumatized may not tolerate in addition any medication that may affect the respiratory system.

DR. MEYER BODANSKY, Galveston, Texas: There can be little question that the use of paraldehyde as an obstetric analgesic carries very little hazard, at least to the adult. Dr. Kotz has submitted evidence of its relative harmlessness to the newborn. At the same time, it must be recognized that exceptional instances do arise. In fact, less than a year ago Dr. Kotz himself reported a fatal case which he and his associates described as one of "idiosyncrasy to paraldehyde" (*THE JOURNAL*, June 25, 1938, p. 2145). A similar case was reported by Drs. J. L. Jenkins and J. Herrod (*Bull. John Sealy Hosp.* 1:27 [Feb.] 1939). A primipara aged 27 received 24 cc. of paraldehyde during labor and shortly thereafter fell into a deep coma lasting forty-four hours. The patient after a subsequent stormy course managed to survive. Dr. Jenkins' case suggested the possibility that the intensity and duration of the effect of the drug were perhaps related to previously coexisting but unsuspected liver impairment. An experimental study was undertaken to determine the effect of liver damage on the pharmacologic action of paraldehyde. In this connection, methods were devised for the accurate determination of paraldehyde in body fluids and respired air. My studies thus far indicate that the presence of liver damage reduces the rate of paraldehyde destruction and greatly prolongs the blood paraldehyde curve, this being accompanied by intensification and prolongation of the narcotic effect. Although I recognize that in general paraldehyde is a relatively harmless drug, nevertheless, on the basis of experimental results, I feel that hepatic insufficiency is a contraindication to its use. Concerning the effects on the newborn, one can only speculate. It is conceivable that, though a transient rise in the concentration of paraldehyde in the blood and tissues of the fetus may be of little consequence, a high level of concentration sustained for many hours may produce a quite different effect, of the pathologic changes of which nothing is known at present. The problem is, therefore, of more than academic interest. However slight the hazard may be, it nevertheless exists, and it is important for obstetricians to keep this fact in mind.

DR. G. D. ROYSTON, St. Louis: Anesthetics and analgesics all carry some dangers in their administration. These dangers, however, are outweighed by their advantages. In the Washington University Clinic, where scopolamine has been used in more than 20,000 labors, the fetal mortality has been somewhat

lower than in labors in which no analgesia was employed, possibly because of closer supervision during this time. Before we began its use in this institution animal experimentation was conducted under the personal supervision of the professor of pharmacology, whose wife was an early patient delivered under this method. These experimental studies showed that scopolamine in doses considerably larger than those used in seminarcois had no effect on either heart or respiration. It was also found that opium in any form, whether morphine, codeine, pantopon (hydrochlorides of the alkaloids of opium, principally morphine) or narcotine (the double salt of morphine and narcotine), depressed the respiratory center and also constricted the bronchioles, hence was a respiratory depressant. It must be remembered that other factors, such as dystocia, compression of the fetal head at the vulval ring, the addition of some anoxemia from ether or gas and the like, also add to the dangers of fetal asphyxia. It is important that analgesics be given in moderate dosage. Among more than 2,000 private patients whom I delivered under scopolamine personally administered, my present technic is as follows: As soon as it is determined that the patient is definitely in active labor she is given from 1½ to 3 grains (0.1 to 0.2 Gm.) of pentobarbital sodium by mouth and scopolamine hydrobromide 1 cc. (½ grain [0.5 mg.]) by hypodermic injection; forty-five minutes later scopolamine hydrobromide 1 cc. by hypodermic and forty-five minutes later a third dose of scopolamine hydrobromide 0.5 cc. (½ grain [0.2 mg.]). Thereafter she is given 0.5 cc. by hypodermic every hour and a half to two hours until delivered. The first stage of labor is slightly shortened and the second is somewhat lengthened. The total duration of labor averaged from thirty minutes to an hour longer with analgesia. Episiotomy and the avoiding of any protracted compression of the fetal head at the introitus markedly reduced the occurrence of delayed fetal respirations and fetal and maternal trauma. The advantages of analgesia are not limited solely to the relief of pain, as their judicious employment often permits a better test of labor until a safer period for intervention (delivery) is reached.

DR. JACOB KOTZ, Washington, D. C.: Dr. Lyons made the statement that in his last 150 or 200 deliveries he used no obstetric analgesia, that he merely talked to his patients. I wonder how many of you have ever had an attack of kidney colic and had somebody talk to you and remember how much relief you got from that. We have tried to give an honest description of what really happens to babies when mothers receive obstetric analgesia. It is true that the initial respiration is slightly delayed, but these babies respond rapidly to simple methods of resuscitation. We believe that paraldehyde, the McCormick technic, pentobarbital sodium and scopolamine, used by trained obstetricians in hospitals adequately prepared for the care of the unconscious patient, are safe methods to be employed during childbirth and should result in no greater mortality or morbidity to the mother or the baby than drop ether.

DR. WYMAN C. C. COLE, Detroit: It would be impossible to answer any important part of these questions in the space at my disposal. I hope that our position has not been misunderstood. We have no thesis that we have been trying to prove and the data which we have presented are simply presented as data. In fact, if we had any objective in mind in undertaking this study it was to show that scopolamine and pentobarbital sodium were harmless. We were not able to do so. We were able to show only a small part of our study today. The other questions that have been asked of us have been answered in the rest of our study, which I will be glad to let anybody see who is interested.

Bread in Reducing Diets.—This staple article of diet is probably more responsible for over-fatness than any other single item of food. Many adults, brought up in childhood on large quantities of bread, butter and jam, suffer from a "bread habit" and find the limitation of bread which is necessary in reducing diets extremely irksome. For some it is easier to give up bread altogether than to have it rationed; they prefer to eat biscuits or rusks. As a rule, however, a little bread should be included in every diet, if only for the purpose of teaching self control.—Christie, W. F.: *Ideal Weight: A Practical Handbook for Patients*, London, William Heinemann, 1938.

THE PRODUCTION OF PERSISTENT ARTERIAL HYPERTENSION BY CELLOPHANE PERINEPHRITIS

IRVINE H. PAGE, M.D.

INDIANAPOLIS

Perinephritis apparently has not been recognized as a possible cause of arterial hypertension. Occasionally hypertension has been recorded for patients whose renal parenchyma from one cause or another has been chronically compressed. Any genetic relationship seems, however, to have been ignored.

During the course of experiments designed to prevent the development of renal cortical collateral circulation, cellophane was tried because it was believed that it would cause little damage to the tissues. It was soon apparent that arterial hypertension had developed in the animals in which cellophane had been wrapped around the kidneys. Examination showed

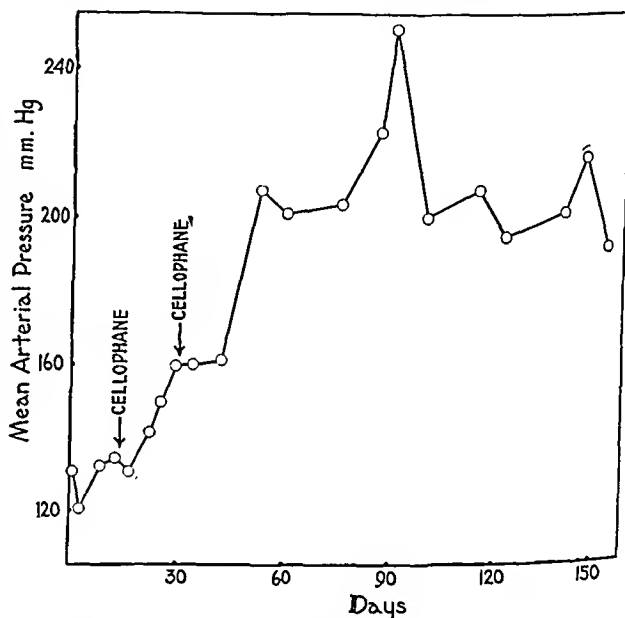


Fig. 1.—Effect on arterial blood pressure of applying cellophane to both kidneys.

them to be enclosed within a fibrocollagenous hull from 3 to 4 mm. thick. The cellophane had been fragmented and taken up, chiefly by the omentum.

The kidney bulged from the hull when it was cut, indicating that the parenchyma was held fast under tension.

The reaction of tissue to cellophane is extraordinary. Contact for relatively short periods (three to thirty days) is enough to evoke a proliferative reaction which continues for a time, at least, after the cellophane has been dispersed by the omentum.

METHOD OF PRODUCING PERSISTENT ARTERIAL HYPERTENSION

A dog, cat or rabbit is placed under pentobarbital sodium anesthesia, an incision parallel to the spine is made and a kidney is exposed and lifted from its bed. The fat is removed, and the organ is wrapped gently

From the Lilly Laboratory for Clinical Research, Indianapolis City Hospital.

Read before the Section on Pathology and Physiology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

A preliminary report of this work has been published (Page, I. H.: A Method for Producing Persistent Hypertension by Cellophane, *Science* 89: 273 [March 24] 1939).

in cellophane sterilized in alcohol. The material may be applied much as if one were making a bag from a flat sheet, the ends being twisted together and held in place by punch paper-clips. String may be employed if it is not important whether the hull forms around the hilus of the kidneys or not. The cellophane need not closely approximate the surface of the kidneys, and it should exert no constrictive effect. Fluid has easy egress from the bag. With dogs the kidney may be dropped back into its bed without fear that its vessels will kink, but with rabbits and cats it is desirable to place one stay suture to insure that the kidney will maintain its proper position. The wound is closed with silk. The operation should take no more than ten minutes.

Various kinds of commercial cellophane have been employed, and most of them provoke an intense fibrocollagenous reaction. Ordinary Du Pont cellophane and sylphwrap are among the best for this purpose. The moisture-proof cellophane seems less reliable. Rubber (surgical glove), tinfoil and oiled surgical silk were found useless, although plain surgical silk was satisfactory.

Blood pressure was measured by a mercury manometer connected with a tube filled with heparin solution to a needle (No. 20) inserted into a femoral artery.

RESULTS

Within three to five days a sharp tissue reaction to the cellophane occurs, and during the next two or three weeks the constricting hull forms around the parenchyma of the kidney. Hypertension occurs whether one or both kidneys are placed in cellophane after the hull has formed. Usually three to five weeks is required for severe hypertension to occur.



Fig. 2.—Kidney parenchyma surrounded by hull which does not involve the renal pedicle. The left hand arrow points to the rim of the hull, which clears the pedicle by a centimeter. The mean arterial pressure was 180 mm. of mercury. The other kidney was normal.

The hypertension may not be as marked or persistent if cellophane has been applied to only one kidney, though this is not always so. Application of cellophane to the other kidney may reinforce and stabilize the hypertension. It is usual for the blood pressure to reach a peak after the first two months, then to fall from 20 to 30 mm. of mercury and remain at an

elevated level. Dogs have maintained hypertension for a year, and there is no reason to suppose it will not continue. The arterial pressure of rabbits and cats responds in much the same way, but apparently renal insufficiency as a result of the cellophane develops in rabbits with greater ease than in other animals.



Fig. 3.—Section of kidney after fibrocollagenous hull has formed as the result of wrapping the kidney in cellophane.

Removal of the Offending Kidney.—If hypertension has resulted from applying cellophane to one kidney and then this kidney is removed, the blood pressure falls within a day or two to the control level. In two experiments the constricting hull was peeled off; in one animal the blood pressure also fell to normal, but in the other the fall was more modest. The longer the hull remains on the kidney, the more difficult it is to strip off.

Renal Denervation.—The nerve supply to the kidneys was removed by stripping the pedicle, with great care, of all visible nerves, and then cellophane was applied to the kidneys. Hypertension developed in all of four animals.

Effect of Stripping the Capsule of the Kidney.—This procedure did not prevent the hull from forming around the kidney parenchyma and the development of hypertension when cellophane was applied.

Adrenalectomy.—In some experiments, after the removal of one adrenal gland, one kidney was wrapped in cellophane. After hypertension had developed, the remaining adrenal gland was removed. The blood pressure fell to normal or slightly hypertensive levels. Removal of both glands in animals with sustained hypertension also resulted in a sharp fall in arterial pressure. If adequate doses of adrenal cortex extract and sodium chloride were administered, moderate hypertension (from 150 to 180 mm.) continued.

Occurrence of Renin Activator.—The activating power of plasma for renin was determined in six dogs made hypertensive with cellophane. The method of Kohlstaedt, Page and Helmer¹ was employed. This consists of comparing the intensity and duration of con-

1. Kohlstaedt, K. G.; Page, I. H., and Helmer, O. M.: The Activation of Renin by Blood, *Am. Heart J.*, to be published.

striction produced in an isolated dog's tail perfused with Ringer-Locke acacia solution when plasma from normal or hypertensive animals and purified renin are mixed and injected into the perfusion fluid.

It was found that the "activator," e.g. the substance in plasma which in combination with renin exerts a constrictor action on blood vessels, was definitely increased in the hypertensive dogs. The details of these experiments are contained in a communication by Kohlstaedt, Page and Helmer.¹

COMMENT

The perinephritis caused by application of cellophane to the kidneys results in the formation of a fibrocollagenous hull which constricts the renal parenchyma. It is not necessary simultaneously to constrict the renal veins, artery or ureter.

The cellophane usually is fragmented and taken up by the omentum with the result that the omentum assumes a peculiar golden brown color and is filled with nodes, each of which contains small bits of cellophane.

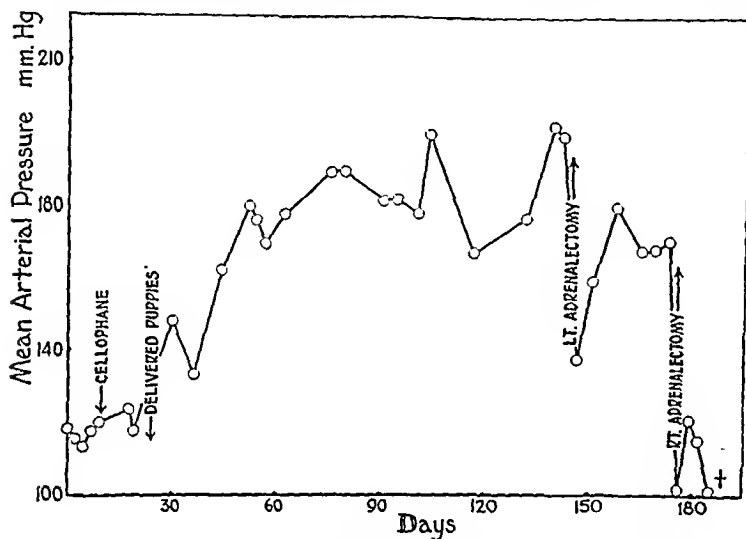


Fig. 4.—Effect on arterial blood pressure of applying cellophane to both kidneys and later removing both adrenal glands.

In spite of the disappearance of the cellophane from the kidneys, the hull continues to thicken for some time, though how long has not been determined.

Sufficient evidence has been collected to suggest that the physiologic mechanism responsible for the hypertension is similar to that concerned when hypertension results from constricting the renal arteries by the Goldblatt clamp. As in that type of hypertension, removal of the offending kidney abolishes the condition (Goldblatt, Lynch, Hanzal and Summerville;² Blalock and Levy³). Similarly, renal denervation does not prevent its development (Page;⁴ Collins⁵). Adrenalectomy seriously modifies the capacity of the body to respond to the hypertensive stimulus (Goldblatt;⁶ Page;⁷ Col-

lins and Wood⁸). Hypertension can be produced by applying cellophane to one kidney and is intensified and usually stabilized by applying it to both kidneys or removing one kidney and applying it to the other. The same applies to Goldblatt hypertension. And lastly, both types of hypertension are associated with an increase of renin activator in the blood (Kohlstaedt, Page and Helmer¹). Removal of the constricting hull often causes the hypertension produced by cellophane to disappear.

The technic of producing hypertension by cellophane is simple and seldom results in failure.

Studies of renal function will be the subject of a separate report in collaboration with Dr. A. C. Corcoran of the Lilly Laboratory for Clinical Research. The morbid tissue changes have been described in a preliminary communication by Dr. Irving Graef, of the New York University Medical School, and myself.⁹

SUMMARY

1. Severe persistent arterial hypertension has been produced in animals by means of perinephritis induced by cellophane and silk. As a result of the perinephritis a thick, fibrocollagenous, constricting hull is formed around the parenchyma but avoiding the pedicle. Renal ischemia is thus produced by a method different in principle from clamping the renal arteries.

2. Removal of the offending kidney or the hull around the kidney abolishes the hypertension.

3. Denervation of the renal pedicle does not prevent the development of hypertension when perinephritis is induced.

4. Bilateral adrenalectomy in untreated animals abolishes the hypertension. If treated with adequate amounts of sodium chloride and adrenal cortex extract, slight hypertension persists.

5. The amount of the substance in the blood which combines with renin to form a pressor substance ("renin-activator") is increased.

6. Perinephritis may be an additional cause of arterial hypertension in man.

ABSTRACT OF DISCUSSION

DR. ALVIN G. FOORD, Pasadena, Calif.: May I ask what are the changes in the arteries and arterioles, as well as those in the parenchyma in the kidney, after prolonged constriction of the kidney by your method?

DR. IRVING H. PAGE, Indianapolis: I should not discuss the question because I am not a pathologist. Dr. Irving Graef of the New York University College of Medicine is studying the material. For the most part, he finds relatively little change except when the malignant stage appears. There may be atrophy of the tubules and areas of fibrosis and infarction. Some of our animals have been alive for eighteen months, but such periods are too short to be certain of the ultimate morbid changes in the kidneys.

DR. FOORD: Would you expect that a similar tumor growth around a kidney in a human being would produce hypertension?

DR. PAGE: It did.

DR. FOORD: Yours was unilateral?

DR. PAGE: No, bilateral. The case was described in detail by Dr. Blatt and myself in the May issue of the *Annals of Internal Medicine*.

8. Collins, D. A., and Wood, E. H.: Experimental Renal Hypertension and Adrenalectomy. *Am. J. Physiol.* 123: 224 (July) 1938.

9. Page, I. H., and Graef, Irving: Hypertension Following Experimental Perinephritis Induced by Cellophane. *Arch. Path.* 28: 613 (Nov.) 1939.

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3. Blalock, Alfred, and Levy, S. E.: Studies on the Etiology of Renal Hypertension. *Ann. Surg.* 106: 826 (Nov.) 1937.

4. Page, I. H.: Relationship of Extrinsic Renal Nerves to Origin of Experimental Hypertension. *Am. J. Physiol.* 112: 166 (May) 1935.

5. Collins, D. A.: Hypertension from Constriction of the Arteries of Denervated Kidneys. *Am. J. Physiol.* 118: 616 (Aug.) 1936.

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NONSURGICAL ASPECTS OF THE KIDNEY STONE PROBLEM

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AND

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Our purpose in this paper is to report some observations which have been made at the Stone Clinic of the Massachusetts General Hospital and in the Research Laboratory since a previous brief report¹ in 1937. This paper is not meant to be a well balanced discussion of all the nonsurgical aspects of the kidney stone problem.

The approach to the entire subject has remained fundamentally the same. It is based on the following major premise and its corollary:

Premise.—A patient with urine of such composition that some crystalloid precipitates out of it is predisposed to the formation of a stone composed largely of the precipitated crystalloid (compare cystine stone in cystinuria, uric acid stone in gout and calcium phosphate or calcium oxalate stone in hyperparathyroidism).

Corollary.—In a case in which there is a tendency for stones composed predominantly of a certain crystalloid to form, treatment should be directed to altering the composition of the urine in such a way that solution of the crystalloid is favored.

It is appreciated that the problem is not quite as simple as the foregoing propositions suggest. Stasis undoubtedly is a factor. Infection, on the other hand, while definitely a factor, probably plays its chief role by changing the composition of the urine (e. g. ammonia formation producing an alkaline urine and favoring the precipitation of phosphates and carbonates).

If one is to apply the aforementioned approach, it is necessary first to know the nature of the stone with which one has to deal. If mixed stones are disregarded, there remain four common types—calcium phosphate, calcium oxalate, uric acid and cystine. Each of these stones requires its own specific measures. For example, the urine should be made acid for calcium phosphate stones and alkaline for uric acid and cystine stones. With oxalate stones the p_H of the urine is unimportant. If no stones are available for analysis, one must resort to circumstantial evidence. A few differential points seem worthy of mention.

Staghorn stones are nearly always, if not always, composed of calcium phosphate or cystine. The latter in some cases have a pathognomonic appearance in the roentgenogram (fig. 1). Very suggestive of cystine stones is the coalescence of several small stones to form a large one (fig. 1 A). The individual small stones, furthermore, have a homogeneous, waxlike appearance, which is most characteristic but hard to describe (fig. 1 B). Cystine stones, of course, occur with cystinuria, so the diagnosis can easily be ruled in or out by testing the urine for cystine.² Phosphate stones, on the other hand, grow by surface apposition and their lamellar structure is often discernible in the roentgenogram. Infection of the urinary tract by an organism which

splits urea is strong evidence that any stones which may be present are composed of phosphates and carbonates. Hyperparathyroidism usually causes calcium phosphate stones but occasionally calcium oxalate ones. A structure suggestive of a snowflake with spicules radiating from a central focus (fig. 2) is pathognomonic of calcium oxalate. Failure of the stone to show in the roentgenogram is strong evidence in favor of a uric acid stone.

DISSOLUTION OF KIDNEY STONES

It is, of course, one thing to prevent the formation of stones and another to dissolve them. A priori one might hope that, if precipitation of a crystalloid influences stone formation, the dissolving of the crystalloid from a stone might cause the disappearance of the stone. Such indeed seems to be the case. Stones, like teeth, are made of an organic matrix in which is deposited a crystalloid. However, there is one important difference. If the calcium is dissolved out of a tooth there is still a tooth; if the calcium is dissolved out of a cal-



Fig. 1.—Appearance of cystine stones in patient R. E. C. before operation: A, coalescence of small stone to form large one; B, stones with waxlike appearance

cium phosphate stone there is no stone. Such being the case, it becomes apparent that the dissolution of stones is not an impossibility.

DISSOLUTION OF CYSTINE STONES

If a cystine stone is placed in a weakly alkaline solution in the laboratory, it very gradually disappears over a period of weeks or months. Thus a cystine stone weighing 0.1292 Gm. immersed in a borate buffer solution of p_H 8.0 at 40 C. lost 14.2 mg. (11 per cent) in eleven days.

It is very simple to keep the urine alkaline, and there is no reason why a cystine stone in the kidney pelvis should not disappear. And it does. Thus a girl aged 15 whose roentgenogram is shown in figure 1 entered the clinic Feb. 1, 1938. Kidney function was only moderately impaired and, surprisingly enough, the urine was not infected. The diagnosis, at once suspected because of the roentgenogram, was confirmed by the demonstration of cystine in the urine. It was thought (we now believe ill advisedly) that surgery was indicated. When this was completed the right kidney was out; there were still some stones in the left kidney and in the perirenal tissues (fig. 3 A), and the urine was infected with *Staphylococcus albus*. The patient was

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Read before the Section on Pharmacology and Therapeutics at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Albright, Fuller: Some Medical Aspects of the Renal Stone Problem, New England J. Med. 217: 1063 (Dec. 30) 1937.

2. To 5 cc. of urine made alkaline with ammonium hydroxide 2 cc. of 5 per cent sodium cyanide solution is added and allowed to stand for from five to ten minutes; a few drops of a freshly prepared 5 per cent sodium nitroprusside solution is then added; in the presence of cystine a permanent deep purplish red will develop.

then put on sodium citrate, 1 teaspoonful three times a day, to keep the urine alkaline. The intrarenal stones gradually disappeared (figs. 3 A and B). The urinary infection has persisted.^{2a} The end result will probably be fairly satisfactory. Another time, however, we would try medical treatment from the beginning. These observations with regard to cystine stones, of course, have been made³ before the present reports.

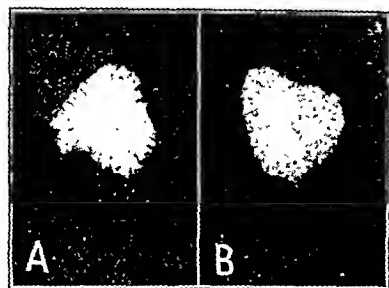


Fig. 2.—Appearance of calcium oxalate stones from two different patients. B is that of patient referred to in the text.

DISSOLUTION OF CALCIUM PHOSPHATE STONES

The problem with calcium phosphate stones is not so simple. Expose a calcium phosphate stone to an acetic acid solution at a p_H of 5.0 in the laboratory and in a very few days there is no stone. Keep the urine of a patient with a calcium phosphate stone in the kidney pelvis at a p_H of 5.0 for several months; the stone will become no larger but in most cases it will become no smaller. There is no question that the Higgins regimen,⁴ one of the main features of which is the production of an acid urine, will cause an occasional calcium phosphate stone to disappear; the question is why the regimen does not work better than it does. The answer is quite apparent. The urine is very nearly saturated with calcium phosphate when it reaches the stone. The more acid the urine the more calcium and phosphate ions it will keep in solution, but the more acid the urine the more calcium and phosphate ions it already contains when excreted by the kidney. If one could cause the patient to excrete an acid urine without

The logical sequel to this discussion is a consideration of the advisability of introducing some dissolving fluid into the kidney "from below" by a catheter. A study of what might be the most efficacious fluid to use has been under way in this laboratory for the past eight months. We are far from having all the answers, but a few simple facts seem clear.

The solution should probably be as acid as possible without being too irritating to the tissues. Urine can reach a p_H of 4.8. Solutions with a p_H of 4.0 seem to cause but little irritation, and this figure has arbitrarily been chosen for the time being.

The next question is what acid to use. Strangely enough, urologists in the past frequently have attempted to dissolve phosphatic calculi with phosphoric acid. This is the one acid not to use (v. infra). Citric acid has a property other than the fact that it is an acid, which suggests its use for this purpose. Dr. M. J. Shear several years ago first called the attention of one of us (F. A.) to the possibility of using citric acid for this purpose. It took a few simple test tube experiments performed in July 1938, however, to show us how efficacious citrate really is.

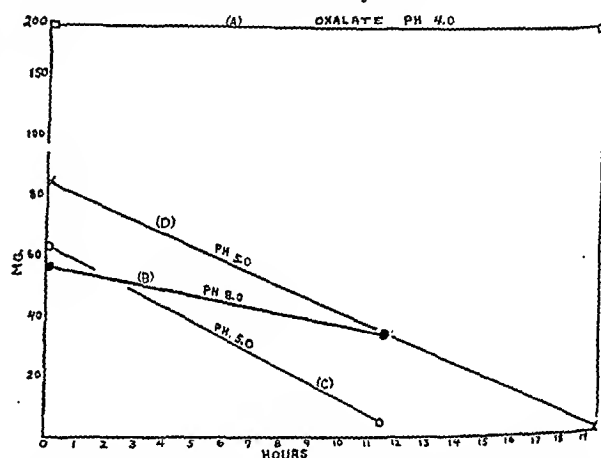
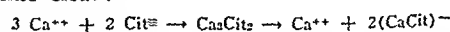


Fig. 4.—Rate of solubility of kidney stones in vitro at different p_H 's with sodium citrate, citric acid mixture of 154 mm. per liter (isotonic): A, calculus consisting mainly of calcium oxalate, citrate solution p_H 4.0, temperature 25 C. B, fragment of calculus consisting mainly of calcium phosphate, citrate solution p_H 8.0, temperature 30 C. C, fragment of calculus from same stone as (B) at p_H 5.0, temperature 30 C. D, calculus consisting mainly of calcium phosphate, citrate solution p_H 5.0, temperature 30 C.

Before discussing the test tube experiments, it may be helpful to explain the specific property of citric acid previously mentioned. The following equation will help make this clear:



It will be noted from the equation that the net result of adding citrate ions to a solution containing Ca ions is to divide the number of Ca ions by 3. The other two thirds of the Ca ions become caught in a complex $(\text{CaCit})^-$ ion. Unfortunately this property of citrate solutions is at its maximum only at alkaline p_H 's; at more acid p_H 's there is little of the tertiary citrate $(\text{Ca}_3\text{Cit}_2)$ formed and more of the secondary (CaHCit) and primary $(\text{Ca}[\text{H}_2\text{Cit}]_2)$ citrates, neither of which produce $(\text{CaCit})^-$ ions. However, both of these salts are weakly dissociated, so there is a marked reduction of calcium ions even at a p_H of 4.0. One can calculate the calcium ion concentration, given the total calcium, the citrate concentration and the p_H , from a nomogram constructed by McLean.⁵

5. McLean, F. C.: Application of the Law of Chemical Equilibrium (Law of Mass Action) to Biological Problems, *Physiol. Rev.* 18:495 (Oct.) 1938.



Fig. 3.—Appearance of cystine stones of patient R. E. C. (see figure 1). A, April 16, 1938, shortly after right nephrectomy and left nephrolithotomy; B, after ten months on medical regimen. Note that most of stones in the kidney have disappeared.

at the same time increasing the calcium and phosphate in the urine, the in vivo results should approach the in vitro ones.

2a. Urinary infection subsequently cleared up spontaneously.
3. Crowell, A. J.: Cystin Nephrolithiasis, *Surg., Gynec. & Obst.* 38: 87 (Jan.) 1924.
4. Higgins, C. C.: Urinary Lithiasis: Experimental Production and Solution with Clinical Application and End Results, *J. Urol.* 36:168 (Aug.) 1936.

The importance of this property of citrate is obvious. The speed of solution of calcium phosphate salts in any fluid will be decreased as the calcium or phosphate ions increase; any property of a fluid which will dispose of one of the end products of the reaction—in this case calcium—will speed up the reaction. The objection to phosphoric acid (v. supra) is, of course, that it supplies

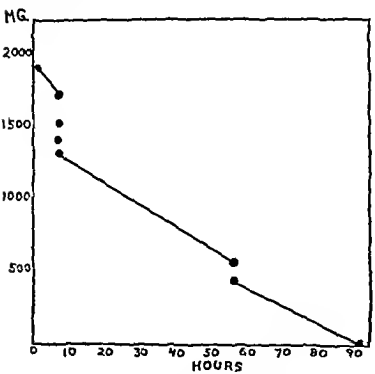


Fig. 5.—Rate of solubility of phosphate kidney stone in sodium citrate-citric acid mixture of 154 mm. per liter (isotonic) at pH 4.0, temperature 25 C. Where loss in weight is not due to citrate solution points are not connected with a line.

The most significant of these experiments is 3, in which a calcium phosphate precipitate is dissolved in an alkaline urine by adding sodium citrate. Experiment 5 suggests that a citrate solution will not help to redissolve oxalates, at least of an acid p_H , although it hinders precipitation of oxalates (experiment 6). More elaborate quantitative studies were designed to determine the effect of temperature, concentration, p_H , other salts and the like, but these are not yet completely satisfactory and will not be discussed here, especially since it appears possible that citrates may be superseded by hexametaphosphate (discussed later). The citrate solution which we used for the in vivo experi-

TABLE 1.—Six Experiments

1. Urine + ammonium hydroxide → calcium phosphate precipitate
2. Urine + ammonium hydroxide → calcium phosphate precipitate + acetic acid → clear solution
3. Urine + ammonium hydroxide → calcium phosphate precipitate + sodium citrate → clear solution
4. Urine + oxalate → calcium oxalate precipitate + acetic acid → no change
5. Urine + oxalate → calcium oxalate precipitate + sodium citrate → no change
6. Urine + sodium citrate (stand 1 hr.) + oxalate → inhibited precipitate

ment discussed later had a p_H of 4.0 and a concentration of citrate which was twice isotonic. Its formula is given in table 2. This is not altogether nonirritating.

EFFECT OF CITRATE SOLUTION ON CALCIUM PHOSPHATE STONES IN VITRO

Quite a large number of experiments have been conducted in which phosphate stones have been subjected to a constant interchange of the citrate solution at various temperatures, and their reduction in size has been noted. Some representative experiments are shown in figures 4, 5 and 6. The speed with which the stones dissolved was most encouraging. Some stones crumble; others decrease in size without crumbling.

IN VIVO EXPERIMENTS ON CALCIUM PHOSPHATE STONES

To date the solution has been tried on four patients. There has been only one convincing success. This patient (C. S.) was a hemophilic youth aged 19 who had had a hemorrhage into the spinal cord. This had resulted in a partial paralysis of the lower extremities and a "cord bladder." He had been bedridden for three years and had been on constant drainage for two years. In the lower extremities osteoporosis had occurred from disuse. The urine was constantly alkaline, owing to

TABLE 2.—Citrate Solution Used

Sodium citrate	45.2 Gm.
Citric acid	38.0 Gm.
Distilled water.....to make	1,000.0 cc.

infection, and the bladder contained nine large laminated stones (fig. 7). One of us (R. C.) saw him in consultation and thought that any surgical procedure was contraindicated. Accordingly the citrate solution was administered to the bladder by Munro's⁶ tidal drainage apparatus. The stones rapidly disappeared, as shown in figures 8 and 9. It may be asked how it is known that the stones were destroyed rather than just decalcified. Figure 8 answers this. If the matrix remained intact, the calcified remnants would not be touching one another.

In the three other cases there was no cause for discouragement, as definite reasons for the lack of success were present and as these can be avoided in the future. One of these cases will be discussed later.

APPARATUS FOR DISSOLVING STONES IN KIDNEY PELVIS

Needless to say, the object of these studies is based on the hope that a stone in the kidney pelvis can ultimately be dissolved by means of a ureteral catheter. An apparatus has been designed for alternately introducing fluid into and withdrawing it from the kidney pelvis. The principle behind this apparatus is the same as that in Munro's tidal drainage apparatus for the bladder. Some of the most important features of this apparatus and the initial impetus were furnished by Dr. William Davis. If the apparatus proves practicable, a description will be published under the authorship of two of us (F. A. and H. W. S.) and Dr. Davis. In its present form it was tried recently on a patient with a large stone in the kidney pelvis which

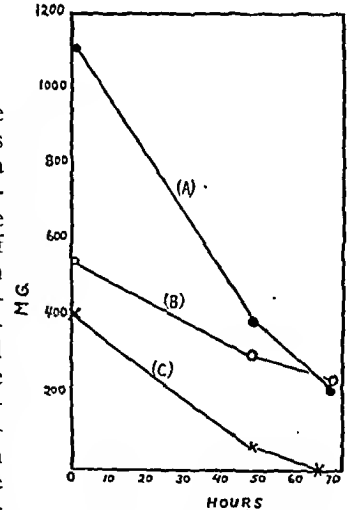


Fig. 6.—Rate of solubility of kidney stones in sodium citrate-citric acid mixture of 154 mm. per liter (isotonic) at pH 4.0, temperature 40 C. A and C, calculi consisting of a large amount of calcium phosphate and some calcium carbonate. B, calculus consisting of a large amount of calcium phosphate and a moderate amount of calcium oxalate.

6. Munro, Donald, and Hahn, Joseph: Tidal Drainage of Urinary Bladder; Preliminary Report of This Method of Treatment as Applied to "Cord Bladders," with Description of Apparatus, New England J. Med. 212:229 (Feb. 7) 1935.

had resulted from hyperparathyroidism. The apparatus was run for three days. The kidney filled and emptied satisfactorily, as determined by introducing 7.5 per cent sodium iodide into the apparatus and roentgenographing the patient. The stone showed no change. It was then



Fig. 7.—Stones in bladder before treatment.

removed and found to be an oxalate stone, which of course explains the failure.

The encouraging feature about this case was that the urine was sterile at the beginning and at the end of the three day run. She received sulfanilamide throughout. After the operation, however, the urine became infected.

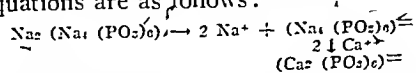
SODIUM HEXAMETAPHOSPHATE

Prof. A. Baird Hastings suggested to us the use of sodium hexametaphosphate. The principle is the same as with citrate except that, whereas citrate disposes of only part of the calcium ions, hexametaphosphate disposes of all by merging them into complex calcium metaphosphate ions.



Fig. 8.—Appearance of stones shown in figure 7 after eighty hours of treatment.

The equations are as follows:



Sodium hexametaphosphate, as was to be expected, has been found most effective in the dissolving of stones in vitro. Best of all, it will actually dissolve calcium oxalate in a test tube. Of course it is not a biologic substance and metaphosphates (PO_3) do not appear in the body, so considerable caution must be exercised in its use. Recent studies in this laboratory by Dr. Max

Rosenheim and Dr. Howard Suby have shown that sodium hexametaphosphate has a marked tendency to produce hemorrhages when introduced into the bladders of dogs.

SUMMARY

The following points are selected as the most important:

1. Cystine stones can often be diagnosed by their roentgenographic appearance.
2. A stone which gives the appearance by roentgenogram of a snowflake with spicules radiating from a central focus is composed largely of calcium oxalate.
3. Attempts to dissolve calcium phosphate stones by making the urine acid are attended with little success because acid regimens increase the amounts of calcium and phosphate in the urine and thus tend to render it saturated. The question of introducing a dissolving fluid "from below," therefore, is brought up.
4. A solution of sodium citrate-citric acid at a p_H of 4.0 is effective in dissolving calcium phosphate stones in vitro and in vivo (one case of stones in the bladder). This solution combines the effect of acids

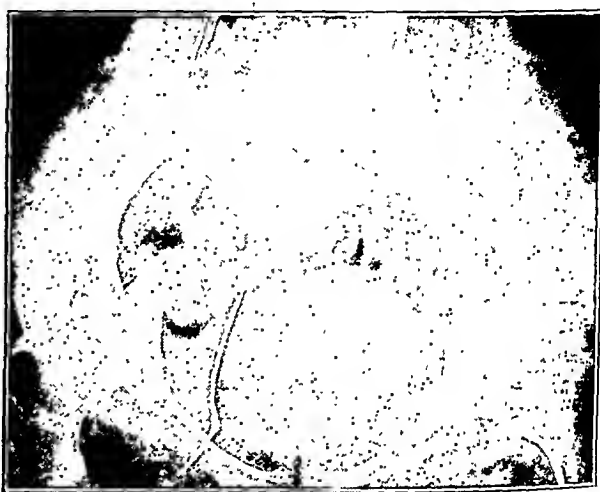


Fig. 9.—Appearance of bladder shown in figures 7 and 8 after ten more days of treatment. After still five more days of treatment stones had entirely disappeared, except for one small shadow, which persisted in spite of further treatment.

in dissolving phosphates with a specific effect of citrate in dissolving calcium salts by decreasing the calcium ion concentration.

5. More recent and less complete studies suggest that sodium hexametaphosphate solutions may be even more effective than citrate ones.

ABSTRACT OF DISCUSSION

DR. CHARLES C. HIGGINS, Cleveland: Dr. Albright and his associates are to be congratulated on the excellent results they have secured in the dissolution of bladder stones. In considering the advisability of utilizing the high vitamin A acid-ash diet to produce the dissolution of a calculus which forms in urine the reaction of which is alkaline, the authors have mentioned a fact which I have been aware of for a long time. That is, by increasing the acidity of the urine one definitely increases the excretion of calcium; however, to offset this, I have observed that the solubility of the stone-forming salts increases more rapidly with increasing acidity than does the amount of calcium excreted. It is necessary to call attention to the fact that chemical formulas indicate only the ultimate products that may be obtained and in no way suggest the time required for equilibrium to be reached. Thus, while it is pos-

sible to say that by the formation of a complex citrate ion two thirds of the calcium ions may be removed from solution, there is no way of knowing that in the concentration of calcium involved and in the presence of the other constituents in the urine this equilibrium will be reached within a reasonable length of time. This will be especially true in cases of phosphates. When one recalls the work of Holt, LaMer and Chown, in which they found that equilibrium between calcium hydroxide and phosphoric acid was reached only after ten days had elapsed, the seriousness of this problem becomes more apparent. I have in my possession roentgenograms revealing stones composed of salts which had precipitated in urine the reaction of which was alkaline or acid, in which the high vitamin A acid-ash or alkaline-ash diets have been used. These roentgenograms have been sent to me by Dr. William Braasch, of the Mayo Clinic; Dr. W. M. Kearns, of Milwaukee, and Professor Pyrah, of Edinburgh, Scotland; the last case was a staghorn cystine stone which has undergone solution by the alkaline-ash diet in my own hands. I now have a series of fifty-two collected cases in which renal calculi have undergone solution by dietary means. The results of this study will be published in the near future.

Clinical Notes, Suggestions and New Instruments

PERFORATION OF THE JEJUNUM DURING A GASTROSCOPIC EXAMINATION OF A RESECTED STOMACH

JOHN M. RUMBALL, M.D., ROCHESTER, N. Y.

To the best of my knowledge there is no report in the literature of a perforation of the stomach or of the jejunum induced by the Wolf-Schindler gastroscope with a rubber finger tip. Five perforations of the stomach have occurred with the round rubber or sponge tip of Henning on the Wolf-Schindler gastroscope.¹ Three of these perforations were observed by Dr. Rudolf Schindler of the University of Chicago Clinics. The Henning tip has been discarded by most men doing gastroscopies since the report of these accidents.

The subject of the present report had been examined gastroscopically six months before, and at this time the Henning tip had been used. The gastroscope was introduced without any force into the jejunum and was then withdrawn so that the stoma could be observed. The patient had had a resection for carcinoma, and since it is my policy to examine these cases gastroscopically at least every six months or oftener if necessary, the examination described here was just a routine follow-up.

REPORT OF CASE

Mrs. F. K., aged 68, white, was admitted to the Rochester General Hospital Sept. 13, 1938, complaining of "stomach trouble" for the preceding three months. The predominating symptoms were weakness, constipation and excessive "gas." There was a mild secondary anemia and the gastric analysis showed a low acidity. The free hydrochloric acid reached only 18 degrees thirty minutes after the administration of histamine. The radiographic study of the stomach revealed a filling defect involving the antral portion of the stomach on the greater curvature side and extending back toward the body.

September 26 a gastric resection of the modified Polya type was done by Dr. D. C. Houghton, senior surgeon in the ward service. The loop of the jejunum was brought up posterior to the mesocolon. The resected portion showed a large crater-like ulcerating tumor, which was classified as a medullary carcinoma by our pathologist. There were no metastases noted anywhere in the abdomen. Two omental nodes were removed, but these showed no evidence of carcinoma. The operation was followed by a transfusion, and the patient made an uneventful recovery. She was discharged on her twenty-sixth postoperative day. Since her discharge she has gained 15 pounds (6.8 Kg.) and her only complaint is occasional "heartburn."

The first gastroscopic examination in January 1939 revealed an adequate stoma, which, however, did not contract rhythmically. There was some increase in the normal red appearance about the stoma. The mucosa of the remaining portion of the stomach showed some atrophic changes. No evidence of recurrence of the malignant condition was seen.

The second gastroscopy was done on the morning of June 15, 1939, at 10:30. The patient was prepared in the usual manner, and the Wolf-Schindler gastroscope with a rubber finger tip was introduced with ease, no force being used. After introduction no pain or discomfort was experienced by the patient. As is often the case, the gastroscope was believed to have slipped into the jejunum. The instrument was withdrawn about 4 or 5 inches and air was introduced. The stoma and the remaining portion of the stomach appeared much the same as on the previous examination. No evidence of a malignant growth was seen. The whole examination was carried out without any difficulty. Immediately after the examination the patient complained of a feeling of distention and faintness. No shoulder pain was noted by the patient. She remained in bed in the outpatient department for about an hour and as she said she felt better she was allowed to go home. Close to 5 o'clock the same day she returned to the emergency department complaining of the same distention and generalized pain in the abdomen. A roentgenogram of the abdomen taken with the patient on her left side showed a large amount of air under the right diaphragm.

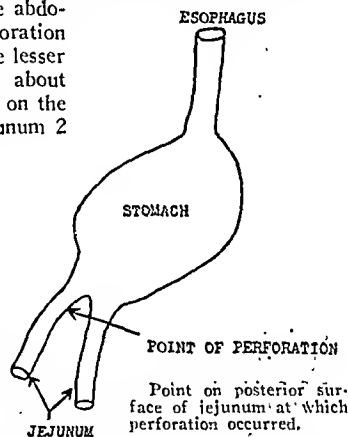
Laparotomy was performed by Dr. Christopher D'Amanda, senior surgeon in the ward surgical service, approximately nine hours after perforation. Free air escaped as soon as the peritoneum was opened, and the abdomen flattened out. Exploration through the mesocolon in the lesser sac revealed a perforation about the size of a dime (18 mm.) on the posterior surface of the jejunum 2 inches away from the stoma, as shown in the accompanying illustration. The perforation was closed and the edges were invaginated. No evidence of peritonitis could be seen, nor were there any metastatic lesions notable. The patient recovered from this insult remarkably well and was asking for a full course meal on her second postoperative day. There was a low grade fever for five days, but the temperature returned to normal and she was discharged on her fifteenth postoperative day feeling fine.

COMMENT

The incidence of this type of perforation is very small and should in no way influence one's faith in the gastroscope as a diagnostic aid; however, it has changed my method of introduction in patients who have had a resection. I believe that one had better be on the safe side and stop the introduction of the instrument at a point where the examiner believes he will best see the stoma. The one important and interesting factor in this case is that all gastroscopic signs of perforation were lacking. Usually the stomach collapses and one is unable to see very much because no air can be introduced. The stomach retained air sufficiently for me to see practically the entire mucosa in this case.

This perforation occurred in the 112th gastroscopy that I have done since October 1938. I feel that the technic that has been followed is in accord with the teachings of Dr. Schindler. The only other question that can be raised is whether the tissue at the point of perforation was normal. No biopsy was taken; it appeared normal to the surgeon, however. With these possibilities eliminated, the only conclusion that one can draw is that this perforation occurred with reasonably good technic and through normal tissue.

17 South Goodman Street.



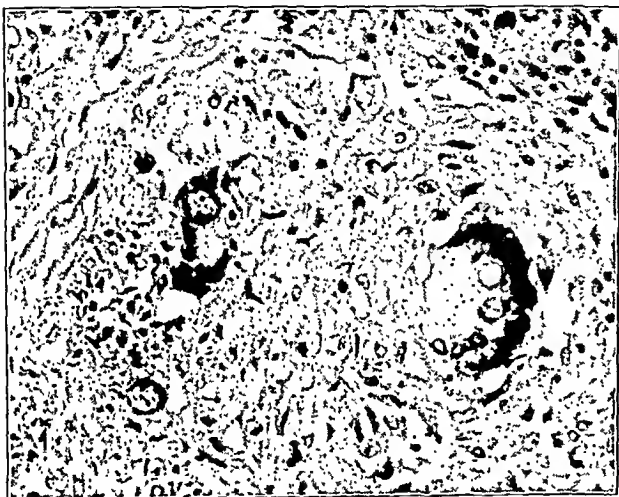
1. Schindler, Rudolf: *Gastroscopy, the Endoscopic Study of Gastric Pathology*, Chicago. University of Chicago Press, 1937, pp. 79-80; *The Incidence of the Various Types of Gastric Disease as Revealed by Gastroscopic Study*, Am. J. M. Sc. 197: 509-516 (April) 1939.

COCCIDIOIDAL PERITONITIS: DIAGNOSIS BY
PERITONEOSCOPYJOHN C. RUDDOCK, M.D., AND ROBERT B. HOPE, M.D.
LOS ANGELES

This case is unique in that it is the first case of coccidioidal peritonitis reported in the literature in which a diagnosis was proved before death. Coccidioidal granuloma is a rare disease and one peculiar to the San Joaquin Valley in California. The first human infection was reported by Wernicke¹ in 1892, and the organism was described as a protozoa. In 1900 Ophuls and Moffitt² proved that the infection known as coccidioidal granuloma was due to a mold (*Coccidioides immitis*) and were able to grow it on culture mediums. Many reports have appeared since this date.

The similarity of this disease to tuberculosis is noted repeatedly in the literature. This similarity exists in its clinical manifestations and body reactions to the infection. Coccidioidal infections often are miliary and it is impossible without a biopsy or culture of the organism to differentiate them clinically or by roentgenogram from tuberculosis. The x-ray appearance of bone lesions is identical with the appearance of lesions caused by the tubercle bacillus.

Although coccidioidal infections have identical clinical manifestations with tuberculosis, nevertheless intestinal and peri-



Section of tissue.

toneal infections seldom occur and are rarely seen. Greaves³ has reported the only case of intestinal infection, which he demonstrated post mortem in a Negro dying of miliary coccidioidal granuloma. Ophuls⁴ in 1929 stated that "intestinal lesions have never been discovered in coccidioidal granuloma."

The following case report demonstrates the value of peritoneoscopy in determining intraperitoneal disease, and the value of obtaining a biopsy.

History.—Y. S., a man aged 35, Japanese, single, entered the hospital Dec. 23, 1937, complaining of swelling of the abdomen and pain in the abdomen of two weeks' duration. Two weeks before entry he began to have pain in the epigastrium. With the onset of pain his abdomen had begun to swell and was progressing in size. Loss of weight was slight. He did not have fever or chills. He did not vomit but had occasional nausea; no hematemesis or melena was present. There had been no symptoms of cardiac or respiratory disease. No jaundice was observed.

The patient was born in the Hawaiian Islands; he had lived in and about Los Angeles for the past eleven years. The

patient stated that he had not resided in the San Joaquin Valley. He had a lesion of the penis in 1936 for which he received no treatment. For the past four years he had been a heavy user of alcohol, drinking both beer and whisky.

No history of familial diseases was given.

Examination.—The temperature was 99.6 F., pulse 96, respiration 20 and blood pressure 140 systolic, 100 diastolic. The patient was poorly nourished, showing recent loss of weight. There were no petechiae or cutaneous eruptions. The teeth were carious. The tongue was coated. There were palpable epitrochlear and cervical lymph glands. The chest was resonant throughout, expansion was equal and the bases moved normally. There were no rales, but hoarse breath sounds were heard at the right base. The heart showed no enlargement, regular rhythm and no murmurs. The abdomen was distended and tense with a definite fluid wave; no masses or organs were palpable. There was pitting edema of the ankles, grade 2.

The Wassermann reaction was negative. Blood examination revealed hemoglobin 75 per cent, red blood cells 3,830,000, white blood cells 13,500, neutrophils 85 per cent, mononuclears 6 per cent, lymphocytes 9 per cent, no pathologic cells. Sedimentation time was 63 mm. in one hour uncorrected, 25 mm. in one hour corrected. Packed cell volume was 28. The urine was normal.

The clinical diagnosis was atrophic cirrhosis (Laënnec).

December 24, paracentesis was done and 4,000 cc. of straw colored fluid was removed. The patient continued to have a low grade fever and to develop more ascites.

December 30, peritoneoscopy revealed dense adhesions of the omentum to the epigastric peritoneal surfaces. All peritoneal surfaces were covered with miliary tubercles. The liver and gallbladder were normal. A section of peritoneum containing tubercles was removed for biopsy. The abdominal cavity was filled with oxygen.

The impression was probable tuberculous peritonitis, but final diagnosis awaited the result of biopsy.

The pathologic examination of the tissue revealed tubercle-like nodules containing *Coccidioides immitis*. Culture of the peritoneal fluid yielded *Coccidioides immitis*. Immediately following peritoneoscopy an x-ray examination of the chest was reported negative.

Course.—Ascites returned and the patient had to have paracentesis performed from time to time. He had a septic temperature of from 100 to 102 F. and failed steadily. Jan. 21, 1938, he suddenly began to have dyspnea and for the first time discomfort in the chest. Examination revealed the typical signs of a bilateral pleural effusion. The fluid was aspirated and *Coccidioides immitis* was demonstrated by culture.

The patient died January 25.

Autopsy.—January 27, the left pleural space was found to contain 1,000 cc. of straw colored fluid, the right, 1,100 cc. The parietal pleura was studded with granulomatous tubercles. The lungs externally were studded with a granulomatous, fibrinous exudate. Tiny tubercles were seen in the parenchyma. The tracheobronchial lymph nodes were only slightly enlarged.

When the peritoneum was opened the entire cavity and intestines were seen to be covered with a thick layer of plastic exudate, which was diffusely infiltrated with nodular granulomatous tubercles, averaging from 0.5 to 1 cm. thick and extending from over the diaphragm to the pelvis. The greater omentum was from 1 to 2 cm. thick and densely infiltrated. The wall of the lesser curvature of the stomach was infiltrated from the external surface inward by granulomatous tissue. The lymph glands in this area were greatly enlarged and caseous, averaging 2 to 4 cm. in diameter. The duodenum, the small intestine and the large intestine were covered with the same thick granulomatous tissue. The mesentery was infiltrated and the glands were enormously enlarged, up to 4 cm. in diameter. Wet smears showed many *Coccidioides immitis* organisms.

The liver and spleen showed some infiltration with granulomatous tissue and tubercles.

The left kidney showed a small collection of tubercles on cross section. The bladder showed infiltration with granulomatous tissue.

The anatomic diagnosis was (1) coccidioidal granuloma; (2) coccidioidal lymphadenitis, generalized; (3) coccidioidal perito-

From the Department of Peritoneoscopy, Los Angeles County General Hospital.

1. Wernicke, R.: Ueber einen Protozoenbefund bei Mycosis Fungoides, *Centralbl. f. Bakt.* 12: 859 (Dec.) 1892.

2. Ophuls, William, and Moffitt, H. C.: A New Pathogenic Mold, *Philadelphia M. J.* 5: 1471, 1900.

3. Greaves, F. C.: Coccidioidal Granuloma with Lesion in Small Intestine, *U. S. Nav. M. Bull.* 32: 201 (April) 1934.

4. Ophuls, William, in discussion on Coccidioidal Granuloma, *J. A. M. A.* 93: 1055 (Oct. 5) 1929.

nitis, generalized; (4) coccidioidal pleuritis, bilateral with effusion; (5) coccidioides of spleen; (6) coccidioides, miliary, of liver; (7) coccidioides of left kidney.

The clinical course with the development of ascites and a history of alcoholism supported a diagnosis of cirrhosis. The conditions as noted with the peritoneoscope were similar to those of tuberculosis of the peritoneal cavity, and oxyperitoneum was instituted as a treatment procedure. Differential diagnosis between tuberculosis and coccidioidal granuloma is not possible without biopsy or culture. A biopsy of the parietal peritoneum and a culture of the fluid revealed *Coccidioides immitis*, thus establishing the diagnosis.

The technic of the procedure of peritoneoscopy is described in detail in previous papers by us.⁵

2202 West Third Street.

INHALATION OF MASSIVE AMOUNTS OF VEGETAL FOREIGN BODIES

W. A. McNICHOLS, M.D., DIXON, ILL.

On July 4, 1939, a girl aged 7 years jumped from a load of hay into a bin of finely ground dry feed containing oats, wheat, corn and corncobs. She sank into this mixture as though it were a liquid, being completely submerged with the exception of one hand. Her brother saw her jump and then he heard two frightened cries. He summoned their father, who with great difficulty was able to extricate her. It is believed that she was submerged for at least ten minutes.

When she was removed from the bin she was cyanotic, unconscious and not breathing. Her mother, who had had nurses' training, cleaned out her daughter's nose and mouth and gave her artificial respiration. Breathing was restored, but it was very rapid and shallow and the cyanotic condition did not improve.

Drs. D. L. Murphy and R. L. Baird, of Dixon, five miles distant, were summoned. They could not obtain breath sounds anywhere over the patient's chest. They wisely elected to move her to the Dixon Public Hospital, where they would have oxygen and bronchoscopic assistance.

The patient arrived at the hospital approximately thirty-five minutes after she jumped into the bin. She was unconscious and cyanotic and had rapid stridulous breathing; the pulse was thready and not countable; no breath sounds were audible anywhere over the chest, and the rate of diaphragmatic movement was from 70 to 80 per minute.

Oxygen was immediately administered by mouth through a catheter. Drs. Murphy and Baird felt that any new insult to the lung would be fatal, so they asked me to do a dry tracheotomy rather than risk losing foreign bodies at the glottis. This we did without anesthesia, all bleeding being stopped before the trachea was opened. The tracheotomy did not improve the patient's condition.

A 5 mm. bronchoscope was inserted through the tracheotomy wound. The trachea was filled with a mushy viscid fluid. After aspiration of the fluid, the bronchoscope was filled with many vegetal foreign bodies. The condition of the trachea proved my colleagues' good judgment in not using a life saver tube or attempting an emergency tracheotomy, as either procedure would have been futile and probably disastrous.

In one hour and twenty minutes, 3¾ drachms (15 Gm.) by volume of oats, wheat, corn and corncobs was removed from the tracheobronchial tree. Five pieces of corncob that were too large to go through the 5 mm. bronchoscope were removed. It was necessary to remove the instrument many times to clean it of the mushy debris. As the bronchi were cleaned out, breath sounds would appear over the corresponding areas. All this time oxygen was being given into the trachea.

Finally no more foreign bodies could be found. The trachea was stitched open with silkworm sutures anchored to the skin. No tube was used. Thus the patient was able to cough out the viscid mucus and foreign bodies.

She was placed in bed with the foot of the bed elevated and oxygen blowing into her trachea. The cyanosis had completely disappeared and breath sounds could be heard over the entire chest. The temperature was 102.8 F., the pulse rate 134, the respiratory rate 40 and the white blood cell count 21,300. Two hours later the child was conscious and able to take liquid nourishment.

The tracheobronchial tree was aspirated as needed, which was at least hourly. From the tracheotomy wound one whole oat kernel was recovered, and the suction apparatus brought out many finer pieces of grain.

The second evening the patient had a chill, with the temperature 103 F., pulse rate 156 and respiratory rate 60. The mucus was blood stained, and pneumococcus type III was found in it. She was given 5 minims (0.3 cc.) of digitalis every four hours for three doses, and 7½ grains (0.5 Gm.) of sulfapyridine, one-eighth grain (0.008 Gm.) of phenobarbital and 5 grains (0.3 Gm.) of sodium bicarbonate every four hours. She immediately improved, but after the tenth dose she began vomiting the medicine and refusing food, so all medication was stopped. By this time her temperature was 100 F., pulse rate 96 and respiratory rate 36. Her appetite returned as soon as the sulfapyridine was discontinued.

On the sixth day, with the temperature 100 F., pulse rate 84 and respiratory rate 32, x-ray examination of the lungs showed them to be clear. A bronchoscope was again inserted and a careful search was made of the tracheobronchial tree for vegetal foreign bodies, but none were found.

On the seventh day, with the temperature 98.6 F., pulse rate 76 and respiratory rate 20, the stitches were removed from the trachea and it was allowed to close. The patient was discharged on the ninth day. She has been seen from time to time, and she is perfectly well.

CONCLUSIONS

1. Inadvisable use of life saver tubes or emergency tracheotomies may frequently be of more harm than good.
2. Oxygen is a great adjunct in treatment in all cases of air deficiency.
3. Sulfapyridine may control nicely an otherwise fatal tracheobronchitis.

101 West First Street.

SEVERE ALLERGIC DERMATITIS FOLLOWING THE PARENTERAL USE OF THEELIN

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The following case seems worthy of being reported because of its rarity and the severity of the reaction.

Mrs. W. G. M., aged 51, a housewife, white, had been under the observation of one of us (J. J. H.) for several months before admission to St. Vincent's Hospital Dec. 29, 1938. She had been experiencing emotional disturbances incidental to the menopause, and a course of treatment with theelin had been proposed and put into effect. She entered the hospital on account of a marked painful, red, erythematous, swollen involvement of the skin over the anterior surface of each thigh. She stated that she had never had any similar skin trouble, and there was no history of allergic dermatitis, hay fever, asthma or food intolerance. The history revealed diphtheria at 4, a pelvic operation at 32 and a left-sided renal calculus removed at operation at the Mayo Clinic at 35. She had three children, who were living and well. A careful inquiry revealed no allergic antecedents.

The cutaneous lesions had first appeared four weeks prior to the hospital admission and during the course of a series of parenterally administered theelin beginning about Nov. 10, 1938. She had been given eight injections of theelin (Parke, Davis & Co.), each 2,000 units, over the anterior aspect of the left thigh, and one injection of estrone (Eli Lilly & Co.) 2,000 units in the same relative area of the opposite side. The injections were rather painful and itched from the outset, with the redness and rash noticeably apparent at the fourth or fifth treatment. This troublesome and distressing reaction progressively

5. Ruddock, John C.: Peritoneoscopy. *West. J. Surg.* 42: 392 (July) 1934; *Surg., Gynec. & Obst.* 65: 623 (Nov.) 1937. Hope, Robert B.: Differential Diagnosis of Ectopic Gestation by Peritoneoscopy, *ibid.* 64: 229 (Feb.) 1937.

increased in severity and area during the remainder of the course of treatments.

Examinations before and after the hospital admission did not reveal relevant manifestations other than the cutaneous condition. Her complaints were subjective, indicating the emotional and nervous instability mentioned. The skin over the anterior surface of each thigh was red and swollen, itched and was markedly erythematous. Superimposed on this angry appearing erythema were many small papules and occasional small vesicles. The greatest intensity of the inflammation on each thigh centered at the point of hypodermic injections midway between the hip and the knee. Practically the entire anterior



Extensive involvement of both legs after parenteral use of theelin.

aspect of each thigh was involved on the date of her hospital admission. The erythema spread rapidly while she was in the hospital, quickly progressing at each area of involvement to an appearance characteristic of allergic dermatitis. It reached such distant points as the ankles and neck by the fourth day. The skin was not uniformly involved but the reaction was most severe over the thighs, both ankles and the lateral aspects of the neck on each side. There was, however, general erythema of all body areas. Both ankles showed considerable swelling with a 2 plus pitting edema. There was no involvement of the mucous membrane. The itching was extreme and at times almost intolerable, doubtless accentuated by the nervous and emotional instability. Fever was not present, the urine remained normal, and the eosinophil count of the blood never exceeded 3 per cent.

Treatment consisted of palliative measures with most relief from a constantly applied lotion containing calamine, menthol, camphor, zinc oxide and solution of calcium hydroxide. Starch baths in a full tub were given several times a day. Hot or cold compresses of saturated solution of aluminum acetate were not apparently helpful. Olive oil relieved the subsequent dryness of the skin.

The patient returned to her home on the eleventh day after admission to the hospital with the cutaneous lesions greatly improved. The generalized pruritus persisted and was very troublesome. The lotion and starch baths gave relief until its subsidence several weeks later.

Inquiry of Eli Lilly & Co. revealed that the fatty solvent used in the marketed ampule was highly purified cottonseed oil, and in the product of Parke, Davis & Co. (theelin) it was peanut oil. The patient had received eight injections of the peanut oil product prior to the single injection of the cottonseed oil preparation. Each company supplied samples of the respective oils used. Patch and scratch tests of each oil were later made on the patient and gave negative results. Later, intradermal tests were made on the flexor surface of each forearm, peanut oil being used on the one side and cottonseed oil on the other. The reaction to each was unmistakable, immediate, severe and widespread. There was a large area of swelling, redness and erythema on each side, spreading over the entire flexor surface of the arm. There was no appreciable difference in the degree or extent of area involved on either side. A few

days later scattered areas of involvement appeared over the skin generally, especially on the legs, trunk and neck. The lesions were entirely comparable with the original trouble. A severe and generalized pruritus followed in the same manner as before, responding to the same management.

We have not found in the material available to us references to dermatitis of allergic origin following the parenteral administration of theelin (estrone) in oil. Inquiry among physicians in this community with wide and extensive experience has not supplied a similar instance. It is probably infrequent, although allergic responses of one type or another are not rare or unusual following the use of cottonseed oil by ingestion in the preparation of food. It does not appear that the estrogenic substance itself was a factor in this reaction. Earlier recognition of similar cases will permit substitution of other methods of administration, such as water soluble preparations, tablets or suppositories.

421 Michigan Street.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT ON VITAMIN K: II

SINCE THE PUBLICATION OF A PRELIMINARY REPORT ON VITAMIN K BY ALBERT M. SNELL IN THE JOURNAL FOR APRIL 15, 1939, THERE HAS BEEN WITNESSED INTENSE INTEREST IN ATTEMPTS TO ISOLATE COMPOUNDS HAVING VITAMIN K ACTIVITY. VERY DEFINITE PROGRESS HAS BEEN MADE IN ESTABLISHING THE CHEMICAL NATURE OF NATURALLY OCCURRING COMPOUNDS, AND MANY SYNTHETIC PREPARATIONS HAVING VITAMIN K ACTIVITY HAVE BEEN PREPARED. SINCE FURTHER EVIDENCE OF THE THERAPEUTIC VALUE OF VITAMIN K PREPARATIONS IS ALSO ACCUMULATING IT SEEMED DESIRABLE TO HAVE A FURTHER REVIEW OF THIS SUBJECT. THE FOLLOWING PAPER HAS BEEN PREPARED BY THE AUTHORS AT THE REQUEST OF THE COUNCIL, AND THE COUNCIL HAS AUTHORIZED ITS PUBLICATION. DURING THE PAST FEW MONTHS THE COUNCIL HAS CONDUCTED EXTENSIVE CORRESPONDENCE RELATING TO THE ADOPTING OF A SUITABLE NONPROPRIETARY NAME FOR VITAMIN K. NAMES WHICH ARE ACCEPTABLE TO THE COUNCIL HAVE BEEN PROPOSED BUT THE COUNCIL IS NOT PREPARED TO MAKE A DEFINITE RECOMMENDATION UNTIL CERTAIN MATTERS RELATING TO PRIORITY HAVE BEEN SETTLED.

PAUL NICHOLAS LEECH, Secretary.

SUPPLEMENTARY REPORT ON VITAMIN K

ALBERT M. SNELL, M.D.

AND

HUGH R. BUTT, M.D.

ROCHESTER, MINN.

In April 1939 a report on the sources, nature and clinical use of vitamin K was prepared by one of us (Snell¹) at the request of the Council on Pharmacy and Chemistry. Since the publication of this report, attention has been called to inaccuracies in the matter of defining a unit of the vitamin. Certain investigators have also questioned some of the statements made with regard to the fundamental causes of deficiency in prothrombin, the methods of recognizing them and the means of dealing with them. This supplementary report has been prepared in an effort both to clarify these matters and to bring up to date the present knowledge of the chemical nature of the vitamin.

DEFINITION OF A UNIT

The Dam unit of activity as defined in some detail in an article by Dam and Glavind² refers to a special preparation of dried spinach, to which a value of 500 units per gram has been arbitrarily assigned. Two mg.

From the Division of Medicine, the Mayo Clinic.

1. Snell, A. M.: Vitamin K: Its Properties, Distribution and Clinical Importance: A Preliminary Report, J. A. M. A. 112:1457-1459 (April 15) 1939.

2. Dam, Henrik, and Glavind, Johannes: Determination of Vitamin K by the Curative Blood-Clotting Method, Biochem. J. 32:1018-1023 (June) 1938.

of this product therefore constitutes one unit. When 2 mg. (1 unit, not 1 mg. as was incorrectly written in the earlier report to the Council) of this standard preparation per gram of body weight is given daily to a highly K-avitaminous chick on three successive days, normal blood clotting is obtained.

Personal communications with Dann³ indicate that her unit of vitamin K is the amount of material, based on a standard of known potency, which when administered to chicks daily will bring about a coagulation time of the blood equal to that produced by the reference standard under the conditions of the test. The reference standard is a special extract of alfalfa which has been shown to be stable over a long period.⁴

Other investigators, including Ansbacher,⁵ have attempted to establish a definition of a unit of vitamin K. Ansbacher's unit is established as "the minimum amount [of vitamin K] necessary to render the blood clotting time of the vitamin K-deficient chick, weighing 70 to 100 Gm., normal within six hours after administration." One of Ansbacher's units is equivalent to 20 Dam units. Thayer and his associates⁶ define a unit of vitamin K as "that quantity of vitamin [K] which produces a clotting time of ten minutes or less in 50 per cent of a group of ten or more chicks which has been fed for the fourteen days immediately following receipt from the hatchery on a diet practically devoid of vitamin K."

Almquist and his associates⁷ have also presented a method of assay of vitamin K, showing that "the reciprocal of the blood clotting time is a simple linear function of the logarithm of the level of the vitamin K level in the ration." Obviously, there is not complete agreement among these investigators working in the same field of biology as to the manner of defining a unit or as to the best methods of assay. While freely admitting the inadequacies of this definition of the unit in the report prepared for publication by the Council on Pharmacy and Chemistry, we are of the opinion that any attempt arbitrarily to establish such a unit of the vitamin is unlikely to suit all investigators. Indeed, it would seem wise to postpone consideration of units, since exact and final knowledge of the chemical structure of substances exhibiting antihemorrhagic activity now is close at hand.

THE CHEMICAL NATURE OF VITAMIN K

In the earlier report to the Council,¹ three of the earlier studies designed to accomplish the purification and isolation of the vitamin were cited. In the light of subsequent developments, these earlier reports can now be omitted from consideration. Recently Almquist and Klose⁸ have prepared a choleic acid derivative, which is a yellow, crystalline substance with a melting point of 186 C. Vitamin K can be separated from this material as a viscous, slightly pigmented oil. Cohn and Schmidt⁹ have shown this preparation to be most effective in increasing low prothrombin values in rats that have biliary fistulas. Dam and his collaborators¹⁰ also

have recently prepared, by a process of molecular distillation and chromatographic methods, a constant product of high purity which they believed to be pure vitamin K. The material, which is a clear yellowish oil, contains carbon, hydrogen and oxygen and is nitrogen free. Elementary analysis has indicated the presence of two atoms of oxygen in the molecule; a tentative composition of carbon 82.2 per cent and hydrogen 10.7 per cent has been established. This material is said to be extremely potent on biologic assay, containing about 20,000,000 Dam units per gram.

In an earlier report the prediction was made that several closely related substances having antihemorrhagic properties were likely to be found in crude extracts of alfalfa or putrefied fish meal. It is in investigations of the type suggested by such a prediction that developments of great importance are now taking place. In May 1939 McKee and his associates¹¹ reported the isolation of vitamins K₁ (from alfalfa) and K₂ (from putrefied fish meal) and presented evidence to indicate a quinoid structure for these vitamins; further work has substantiated these preliminary statements.¹² Almquist and Klose¹³ recently have reported that phthiocol (2-methyl-3-hydroxy-1,4-naphthoquinone) possesses physical and chemical properties similar to pure vitamin K.^{13a} Phthiocol was first isolated by Anderson and Newman¹⁴ from the pigment of *Mycobacterium tuberculosis*; its synthesis was announced in 1934.¹⁵ It has been shown by Almquist and Klose¹³ that phthiocol is effective in preventing hemorrhagic diathesis in chicks subsisting on a K-deficient diet when phthiocol is given at 20 mg. per kilogram of diet. They have also suggested that phthiocol is the simplest member of a homologous series of antihemorrhagic substances. Later these investigators¹⁶ reported that the antihemorrhagic activity of phthiocol lay somewhere between that of methyl naphthoquinone and hydroxy naphthoquinone. Their study indicated that the methyl group was functionally important whereas the hydroxyl group seemed to reduce activity. They agreed that the activity of phthiocol is lower than the more complex form of vitamin K existing in alfalfa; Ansbacher and Fernholz¹⁷ were of a similar opinion. The use of phthiocol in the correction of prothrombin deficiency in chicks has been studied in detail by Almquist and Klose;¹³ clinical studies with this material will be mentioned later in this report.

11. McKee, R. W.; Binkley, S. B.; MacCorquodale, D. W.; Thayer, S. A., and Doisy, E. A.: The Isolation of Vitamins K₁ and K₂, *J. Am. Chem. Soc.* **61**: 1295 (May) 1939.

12. Binkley, S. B.; MacCorquodale, D. W.; Cheney, L. C.; Thayer, S. A.; McKee, R. W., and Doisy, E. A.: Derivatives of Vitamins K₁ and K₂, *J. Am. Chem. Soc.* **61**: 1612-1613 (June) 1939.

13. Almquist, H. J., and Klose, A. A.: The Antihemorrhagic Activity of Pure Synthetic Phthiocol, *J. Am. Chem. Soc.* **61**: 1923-1924 (July) 1939.

13a. It has been thought that phthiocol owes its activity to some impurity, presumably 2-methyl-1,4-naphthoquinone. However, the most recent report of Fernholz and Ansbacher (Vitamin K Activity of Synthetic Phthiocol, *Science* **90**: 215 (Sept. 11 1939)) indicates that even after purification, synthetic phthiocol has antihemorrhagic properties. In this same report they also noted the powerful curative effect of 2-methyl-1,4-naphthoquinone in chicks deficient in vitamin K.

14. Anderson, R. J., and Newman, M. S.: The Chemistry of the Lipids of Tubercle Bacilli: XXXIV. Isolation of a Pigment and of Anisic Acid from the Acetone-Soluble Fat of the Human Tubercle Bacillus, *J. Biol. Chem.* **101**: 773-779 (Aug.) 1933; The Chemistry of the Lipids of Tubercle Bacilli: XXXV. The Constitution of Phthiocol, the Pigment Isolated from the Human Tubercle Bacillus, *ibid.* **103**: 197-201 (Nov.) 1933.

15. Newman, M. S.; Crowder, J. A., and Anderson, R. J.: The Chemistry of the Lipids of Tubercle Bacilli: XXXVIII. A New Synthesis of Phthiocol, the Pigment of the Human Tubercle Bacillus, *J. Biol. Chem.* **105**: 279-281 (May) 1934.

16. Almquist, H. J., and Klose, A. A.: The Antihemorrhagic Activity of Certain Naphthoquinones, *J. Am. Chem. Soc.* **61**: 1923-1924 (July) 1939.

17. Ansbacher, S., and Fernholz, Erhard: Simple Compounds with Vitamin K Activity, *J. Am. Chem. Soc.* **61**: 1924-1925 (July) 1939.

3. Dann, Florence P.: Personal communication to the authors.

4. Further details of this method are to be published shortly.

5. Ansbacher, S.: A Quantitative Biological Assay of Vitamin K, *J. Nutrition* **17**: 303-315 (April) 1939.

6. Thayer, S. A.; McKee, R. W.; Binkley, S. B.; MacCorquodale, D. W., and Doisy, E. A.: Assay of Vitamin K Concentrates, *Proc. Soc. Exper. Biol. & Med.* **40**: 478-481 (March) 1939.

7. Almquist, H. J.; Mecchi, E., and Klose, A. A.: Estimation of the Antihemorrhagic Vitamin, *Biochem. J.* **2**: 1897-1903 (Nov.) 1938.

8. Almquist, H. J., and Klose, A. A.: The Isolation of Vitamin K as a Choleic Acid, *J. Am. Chem. Soc.* **61**: 745-746 (March) 1939.

9. Cohn, E. T., and Schmidt, C. L. A.: Effect of Choleic Acid of Vitamin K on Prothrombin Levels of Bile Fistula Rats, *Proc. Soc. Exper. Biol. & Med.* **41**: 443-444 (June) 1939.

10. Dam, Henrik; Geiger, A.; Glavind, J.; Karrer, P.; Karrer, W.; Rothschild, E., and Salomon, H.: Isolierung des Vitamins K in hochgereinigter Form, *Helvet. chim. acta.* **22**: 310-313, 1939.

Recently Thayer and his associates,¹⁸ as well as MacCorquodale and his co-workers,¹⁹ working in Doisy's Laboratory at St. Louis University Medical School, have found 2-methyl-1,4-naphthoquinone the most active compound studied, but when this compound was compared with the natural vitamins K₁ and K₂ its activity was relatively insignificant. They believed the structure of the vitamin K₁ molecule to be 2-ethyl-3-phytyl-1,4-naphthoquinone. Fieser and his co-workers²⁰ suggested that the structure of K₁ was 2,6 (?) -dimethyl-3-phytyl-1,4-naphthoquinone (or the 2-mono-methyl compound) and that that of vitamin K₂ was 2,3-difarnesyl-1,4-naphthoquinone.

Further work by Binkley, MacCorquodale, Thayer and Doisy²¹ at St. Louis University Medical School has confirmed, through synthesis, the structural formula of vitamin K. Their experiments demonstrate conclusively that the structure of vitamin K₁ is correctly represented by the formula 2-methyl-3-phytyl-1,4-naphthoquinone. This work has been further confirmed by Fieser, Campbell, Fry and Gates,²² who described the synthesis of vitamin K₁.

Since the activity of 2-methyl-1,4-naphthoquinone is approximately equal to that of pure vitamin K₁, Thayer, Binkley, MacCorquodale, Doisy, Emmett, Brown, and Bird²³ have suggested that it be adopted as a basic standard for assay of vitamin K. The compound does have desirable qualities for standardization in that it can be obtained readily in a satisfactory state of purity, has a definite melting point for characterization and, when protected from excessive exposure to light, is readily stable. They suggested that by adopting this substance as the standard for assay the unit could then be defined in terms used by the League of Nations committee as the specific vitamin K activity of 1 microgram of pure 2-methyl-1,4-naphthoquinone.

THE GENERAL CLINICAL CAUSES OF DEFICIENCY IN PROTHROMBIN

In the earlier report the methods of Quick, of Dam and his co-workers and of Warner, Smith and Brinkhous were mentioned. The method of Quick has found favorable reception in this country and is now widely used as a routine method for determining deficiency in prothrombin in hospital practice; Dam and Glavind still prefer their modification of Fisher's method. Zifren and his co-workers²⁴ have recently described a simple "bedside" method of comparing the clotting time of normal blood to that of the specimen in question after thromboplastin has been added to each. The unknown is expressed in percentage of the normal.

The principal clinical points to be emphasized here are: (1) that whichever of these methods for deter-

mining deficiency in prothrombin is to be employed most effectively depends somewhat on the experience and the facilities of the physician concerned; (2) that the nature of prothrombin is unknown and that all methods of measurement thus far proposed are open to some objections on this score, and (3) that the simpler the method used, the more likely it is to be used as frequently as is necessary in the care of patients who have actual or impending hemorrhagic tendencies.

THE GENERAL CLINICAL CAUSES OF DEFICIENCY IN PROTHROMBIN

Several investigators have reported a number of conditions in which there exists a deficiency of prothrombin which can be corrected by the administration of vitamin K. Hypoprothrombinemia among human beings apparently may occur in any of the following circumstances:

1. After ingestion of a diet inadequate in vitamin K. Hypoprothrombinemia from this cause is being reported by Kark and Lozner;²⁵ their patients responded adequately to the administration of vitamin K. This clinical observation is well supported by the experimental production of low blood values for prothrombin in rabbits (Dam and Glavind²⁶), in rats (Greaves²⁷), and in mice (Murphy²⁸) following the administration of diets deficient in vitamin K.

2. In newborn infants. Waddell and Guerry²⁹ have recently reported that among newly born infants there is not infrequently a deficiency of prothrombin which responds to the administration of vitamin K by mouth. The mechanism of this type of prothrombin deficiency is not entirely clear, although it is suggested that such a deficiency might be corrected by the administration of vitamin K to mothers before delivery.

3. With inadequate intestinal absorption. This may result from: (a) lack of bile in the intestine due to a poor secretion of bile salts, to (b) an obstruction of the bile ducts from any cause, or to (c) inadequate absorption due to various intestinal lesions, including short-circuiting surgical procedures and intestinal obstruction. All these various factors have been demonstrated among patients by Osterberg and us³⁰ and by Clark and his associates.³¹ It has likewise been demonstrated that severe diarrheal diseases, such as ulcerative colitis, sprue or celiac disease, may result in a deficiency in prothrombin.

4. Injury to the liver. There is considerable evidence, clinical and experimental, to indicate that the liver plays an active part in the formation of prothrombin. It must be admitted that some of this evidence is largely circumstantial. Smith, Warner and Brinkhous³² have shown

18. Thayer, S. A.; Cheney, L. C.; Binkley, S. B.; MacCorquodale, D. W., and Doisy, E. A.: Vitamin K Activity of Some Quinones, *J. Am. Chem. Soc.* **61**:1932 (July) 1939.
19. MacCorquodale, D. W.; Binkley, S. B.; Thayer, S. A., and Doisy, E. A.: On the Constitution of Vitamin K₁, *J. Am. Chem. Soc.* **61**:1928-1929 (July) 1939.
20. Fieser, L. F.; Bowen, D. M.; Campbell, W. P.; Fieser, Mary; Fry, E. M.; Jones, R. N.; Riegel, Byron; Schweitzer, C. E., and Smith, P. G.: Quinones Having Vitamin K Activity, *J. Am. Chem. Soc.* **61**:1925-1926 (July) 1939.
21. Binkley, S. B.; MacCorquodale, D. W.; Thayer, S. A., and Doisy, E. A.: The Isolation of Vitamin K₁, *J. Biol. Chem.* **130**:219-234 (Sept.) 1939.
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30. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: The Use of Vitamin K and Bile in Treatment of the Hemorrhagic Diathesis in Cases of Jaundice, *Proc. Staff Meet., Mayo Clin.* **13**:74-80 (Feb. 2) 1938; Further Observations on the Use of Vitamin K in the Prevention and Control of the Hemorrhagic Diathesis in Cases of Jaundice, *ibid.* **13**:753-764 (Nov. 30) 1938. Footnote 32.
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that in dogs whose livers have been injured by acute intoxication with chloroform there develops a deficiency in prothrombin with a definite hemorrhagic tendency. More recent work by Warner³³ indicates that extirpation of a large portion of the liver in rats results in a marked decrease in the concentration of prothrombin in the plasma, thus supporting the belief that the liver is perhaps directly concerned in the manufacture of plasma prothrombin. Warren and Rhoads³⁴ have performed complete hepatectomies in dogs and have noted a rather rapid decrease in the concentration of prothrombin in the plasma following this procedure. They concluded that the liver is essential to the formation of prothrombin in the dog. Their work further supports the contentions previously mentioned.

Clinically we³⁵ have seen, as has Warner,³⁶ that primary hepatic disease, such as cirrhosis, atrophy or chronic hepatitis, is not infrequently accompanied by hypoprothrombinemia. We have encountered several patients having primary hepatic damage who, in spite of an adequate diet and ingestion of adequate amounts of bile salts or bile by mouth, continued to exhibit a pronounced deficiency in prothrombin. An occasional patient in such a group as this will not respond even to large doses of concentrates of vitamin K administered orally with bile salts or given intramuscularly. These clinical observations again tend to support the thesis that the liver is intimately connected with the whole process of prothrombin formation.

These recent developments show that there are apparently several conditions other than those previously reported in which a deficiency of prothrombin may be encountered. The conclusion seems justified that at least four basic factors appear to be necessary in the prevention and control of hypoprothrombinemia that may occur among human beings, namely (1) the presence of bile of normal composition in the intestinal tract; (2) a diet containing the vitamin itself or materials from which it can be formed; (3) presence of a normal absorptive surface in the small intestine, and (4) a liver which is capable of performing adequately the synthesis of prothrombin.

METHODS OF ADMINISTRATION

Methods for the oral administration of vitamin K and bile or bile salts in the treatment of deficiency in prothrombin have been described in recent papers in *THE JOURNAL*.³⁷

Dam and his co-workers have shown that definite beneficial effects on patients having a deficiency in prothrombin follow the intramuscular administration of emulsions of vitamin K. At the time of our earlier report we were not able to reproduce the results of Dam and his co-workers by using preparations of vitamin K available to us; we have since fully confirmed their observations. The response to intramuscular administration is distinctly less rapid than that which follows oral administration. Also it is not apparent that any great advantage accrues to the patient by the

intramuscular procedure except when the jaundiced individual in question is, for one reason or another, unable to take or absorb the vitamin by mouth. The possible advantage of long-continued slow absorption of injected material must be mentioned. The peroral method of administration has sufficed for the care of the great majority of patients having a deficiency in prothrombin, and in our opinion it is still the best method for general use.

In the treatment of patients who have hypoprothrombinemia, circumstances occasionally arise in which the intravenous administration of vitamin K might be desirable. However, we have felt that to administer intravenously the preparations of vitamin K available to us in the past would have entailed considerable danger to the patient. Recently Dam³⁸ has administered emulsions of vitamin K intravenously to human beings without the occurrence of untoward reactions. The recent report by Almquist and Klose that phthiocol exhibited antihemorrhagic properties suggests that this compound might be well adapted for parenteral administration and thus might be useful clinically. Smith and his associates³⁹ of the University of Iowa made a brief report in a note at the conclusion of their recent article in *THE JOURNAL* concerning the intravenous administration of phthiocol to one patient who had obstructive jaundice, following which there was an increase in the concentration of prothrombin in the plasma.

We have recently reported the intravenous administration of phthiocol to a number of patients having hypoprothrombinemia.⁴⁰ To one individual, 100 mg. of the material was administered by mouth together with bile salts, with a resulting elevation in the concentration of prothrombin as measured by the method of Warner and his associates. We have also administered intravenous preparations of phthiocol in doses of from 25 to 50 mg. to nine patients having hypoprothrombinemia. These patients had obstructive jaundice or primary hepatic injury, and one patient had intestinal obstruction. In each instance following the administration of phthiocol there was a reduction in the prolonged Quick prothrombin clotting time.⁴¹ No untoward reactions were noted following the administration of phthiocol in any instance. Whether or not the intravenous use of preparations exhibiting antihemorrhagic activity will replace the oral methods now in general use must await further clinical developments.

CONCLUSIONS

Various phases of the chemical, physiologic, biologic aspects and the clinical usefulness of vitamin K are developing so rapidly that a number of the views expressed in the present report may require modification within a comparatively short time. Therefore it would seem wise at the present moment to withhold any dogmatic statements until the recently developed chemical products exhibiting vitamin K activity have been studied more extensively from biologic and clinical standpoints.

33. Warner, E. D.: Plasma Prothrombin: Effect of Partial Hepatectomy. *J. Exper. Med.* **68**: 831-835 (Dec.) 1938.

34. Warren, Richard, and Rhoads, J. E.: The Hepatic Origin of the Plasma-Prothrombin Observations After Total Hepatectomy in the Dog. *Am. J. M. Sc.* **198**: 193-197 (Aug.) 1939.

35. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: The Preoperative and Postoperative Administration of Vitamin K to Patients Having Jaundice. *J. A. M. A.* **113**: 383-390 (July 29) 1939.

36. Warner, E. D., in discussion on Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Oral and Intramuscular Administration of Vitamin K in the Treatment of Obstructive Jaundice. *J. A. M. A.* **113**: 380-381 (July 29) 1939.

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38. Dam, Henrik: Personal communication to the authors.

39. Smith, H. P.; Ziffren, S. E.; Owen, C. A., and Hoffman, G. R.: Note at the Completion of Article "Clinical and Experimental Studies on Vitamin K." *J. A. M. A.* **113**: 383 (July 29) 1939.

40. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Phthiocol: Its Therapeutic Effect in the Treatment of Hypoprothrombinemia Associated with Jaundice: A Preliminary Report. *Proc. Staff Meet., Mayo Clin.* **14**: 497-502 (Aug. 9) 1939.

41. Since this report was submitted to the Council a synthetic compound, 1,4-dihydroxy-2-methyl-3-naphthaldehyde, has been supplied to us by Dr. E. A. Doisy of St. Louis. When administered intravenously in doses of from 5 to 10 mg. this preparation has been effective in reducing elevated prothrombin times as calculated by the Quick method, in cases of obstructive jaundice. Ten patients have been treated and no untoward reactions have been noted.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 2, 1939

The Platform of the American Medical Association

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

HEREDITY IN INFECTIOUS DISEASES

Since 1923 the role of heredity in infectious diseases has been studied by Webster,¹ who investigated the behavior of these diseases in mice. Common practice shows, he says, that if a batch of mice is given an injection of a virulent agent by some artificial route the great majority die within a few hours. Observed differences in survival rates under the influence of less virulent agents, smaller doses and like variations have heretofore been attributed solely to uncontrolled errors of technic. It was shown in 1923 that batches of laboratory bred mice exposed to infectious agents in a way simulating nature differed from batches of uncontrolled mice in responding as a group in a relatively predictable manner. Further, by varying the diet a definite individual difference was demonstrable. Progeny from parents which died early from test infection with mouse typhoid were more susceptible than those from parents which survived such test infection. This observation was regarded as proof that parents which died early were actually more susceptible by inheritance than those which survived. From highly susceptible parents, lines of varying high susceptibility to mouse typhoid and to encephalitis virus were developed through selection and brother-to-sister inbreeding. Susceptibility remained unchanged for twelve generations in lines in which it was greatest at the outset, while, in lines in which it was intermediate, susceptibility increased through selection.

The same circumstances held true for resistant lines. The crossing of highly susceptible with highly resistant lines resulted in percentage mortalities approximately like those which would be expected on the basis of a single factor type of mendelian inheritance for resistance to mouse typhoid and to encephalitis virus as well. Resistance proved dominant in each instance. It was shown, however, that the amount of inherent resistance displayed by an individual to one infectious agent could not necessarily be taken as a measure of resistance to another infectious agent. Under conditions in which mouse typhoid is allowed to spread naturally among herds of mice composed of different proportions of individuals of innately high or low susceptibility, from 85 to 95 per cent of the innately susceptible succumbed to the infection, in contrast to less than 5 per cent of the innately resistant. The surviving population becomes composed, therefore, largely of individuals known at the outset to be innately resistant, although these are nevertheless likely to become infected and to harbor mouse typhoid bacilli. When new individuals, chiefly of innately resistant stocks, are added to surviving populations, mouse typhoid spreads to both resistant and susceptible. Mortality from the infection, however, is again almost exclusively limited to susceptible recruits and is sporadic or epidemic according to the numbers and proportions added.

1. Webster, Leslie T.: *Heredity in Infectious Disease*, J. Heredity 30: 365 (Sept.) 1939.

Assuming the fact that inherited factors are of basic importance in determining the character of infection in both the individual and the herd, present interest is principally focused, Webster says, on the methods of modifying the expression of these factors through environmental ones. Of those tested so far, diet is the most important and has been proved capable of changing susceptibles to resistants and vice versa. Indeed, epidemics may be started and terminated merely by altering the dietary factors.

Even if only a few of the implications of these experimental studies can be applied to human conditions, the effect on medical thought may be revolutionary. The part which inherited disposition in resistance to infectious disease may play is highly important. A significant element may also be introduced into the understanding of many phases of human epidemiology. Finally the alteration of what appears to be a hereditary character by such environmental factors as diet may exert an unprophesiable effect on the course of many human activities. Indeed, even though the results of these studies cannot as yet be applied to man, they should serve to stimulate new lines of thought.

TRANSFUSION OF PRESERVED BLOOD

The obvious advantages of storing blood for transfusion have led to the adoption of "blood banks" by many large hospitals throughout the country.¹ With grouped and serologically tested blood always available, precious time is saved in the emergencies that so often arise in accident and surgical cases. In time of war this becomes even more important than in civil life. In addition there is a large financial saving, since there is less need for professional donors. During the past two years preserved blood has probably been used for thousands of transfusions.

While the transfusion of preserved blood has definite advantages, there are also certain limitations to its use. Blood is a living fluid, and processes tending toward autolysis continue even when it is stored at low temperatures *in vitro*. It becomes important to establish, therefore, the maximum length of time during which such blood can be kept before use, and in this there seems to be no unanimous agreement. Two methods of approach have been used, namely the study of the changes which occur in stored blood and the results of the transfusion of such blood.

Blood stored *in vitro* keeps best at temperatures between 0 and 5 C. But even at low temperatures the platelets and leukocytes break down within a period of only a few days. According to Rhoads and Panzer² the prothrombin time of blood stored even for periods of from one to two days is greatly prolonged, and therefore the consensus is that stored blood is not as

useful as fresh blood in hemorrhagic diseases. Most of the studies have centered about the behavior of the erythrocytes, since these after all are the most essential elements in the treatment of hemorrhage and anemia. A progressive increase in the fragility of the erythrocytes has been noted as the storage time is lengthened, but manifest hemolysis is not evident until the end of the second week. Scudder and his co-workers³ have observed a marked shift of the potassium ions from the red blood cells into the plasma with blood kept more than five days and feel therefore that such blood should not be used for transfusion. It seems doubtful, however, that the amount of free potassium is sufficient to cause toxic symptoms.

With regard to results of transfusion, it has been found that there is no difference in the incidence of untoward reactions provided the blood has not been kept too long. At the Cook County Hospital¹ the time limit set for the storage of blood is ten days, since a significant increase in the number and severity of reactions was noted when the blood had been kept for longer periods. From another angle, Schaefer and Wiener⁴ have recently attacked the problem by tracing the fate of the transfused erythrocytes in the patient's circulation. With a method similar to that used by Ashby, who showed that when fresh blood is transfused the erythrocytes persist in the circulation for periods up to three or four months, these authors found that, when blood less than five to eight days old was transfused, the period of survival was not significantly different from that of fresh blood. However, in four cases when blood stored for periods ranging from ten to twenty days was used, the cells could be detected in the patient's circulation only up to from one to three weeks. In most of these cases the number of transfused erythrocytes dropped rapidly, and this was accompanied by the appearance of an icteric tint in the patient's serum. This could be demonstrated regularly after the injection of blood more than from eight to twelve days old, provided the patient's serum was examined at the proper time.

These investigations indicate that blood more than from a week to ten days old is not equivalent to fresh blood. Indeed, with blood that is too old there is even some danger of hemoglobinuria and serious symptoms such as are known to result from the transfusion of incompatible blood.

When the available data are taken into consideration, it is evident that the transfusion of preserved blood has acquired an important role. This is a great change in attitude from the opinion held less than two decades ago, when the transfusion of citrated blood even when fresh was looked at askance. However, there are defi-

1. Fantus, Bernard: The Therapy of the Cook County Hospital: Blood Preservation Technic, *J. A. M. A.* **111**: 317 (July 21) 1938.

2. Rhoads, J. E., and Panzer, L. M.: Prothrombin Time in "Bank Blood," *J. A. M. A.* **112**: 309 (Jan. 8) 1939.

3. Scudder, John; Drew, C. R.; Corcoran, Dorothy R., and Bull, D. C.: Studies in Blood Preservation: I. Repartition of Potassium in Cells and Plasma, *J. A. M. A.* **112**: 2263 (June 3) 1939.

4. Schaefer, George, and Wiener, A. S.: Limitations in the Use of Preserved Blood for Transfusions, *Quart. Bull. Sea View Hosp.* **5**: 17 (Oct.) 1939.

nite limitations to the use of stored blood which should be taken into account. Pending further investigation, a safe limit to set for the use of such blood would be between five and ten days. Perhaps by improving the method of storing blood it may be possible to extend the time limit.

Current Comment

NATIONAL PHYSICIANS' COMMITTEE FOR THE EXTENSION OF MEDICAL SERVICE

An item appears in the Organization Section in this issue of *THE JOURNAL* telling of the organization of the National Physicians' Committee for the Extension of Medical Service. This committee is headed by a group of physicians, many of whom are widely known for their work in the American Medical Association. The organization is not, however, officially connected with the American Medical Association itself. Information elicited from the officials of the National Physicians' Committee indicates that this group has been organized voluntarily to carry on education of the public regarding the extension of medical service and preventive medicine. Their work is of the nature of public relations activities. The National Physicians' Committee is in a position to accept contributions from industrial and other organizations in order to aid this campaign. The American Medical Association itself has not in the past and does not now accept such contributions. Officials of the organization state also that it is their intent to include in the various subcommittees of the main organization groups of dentists, nurses, hospital executives, pharmacists and all of the other special groups in the field of medicine.

NORMAL BLOOD PRESSURE

Much difference of opinion prevails as to what constitutes normal blood pressure; obviously the pressure can vary widely among different individuals of the same age groups or in the same individual at different ages and under altered circumstances. A recent study of this subject by Robinson and Bruer¹ has tended to revise downward generally accepted normal blood pressure levels. These authors made an exhaustive statistical study of 7,478 men and 3,405 women, all relatively sedentary in their occupations, selected at random in the Chicago area and economically selected by being able to afford insurance policies of \$1,000 or more. Eighty-six per cent of the men had systolic blood pressures of between 90 and 130 mm. of mercury, 54 per cent between 100 and 120, 6 per cent below 100 and 25 per cent below 110. Of the women, 89 per cent had systolic pressures of between 90 and 130, 56 per cent between 100 and 120, 18 per cent below 100 and 44 per cent below 110. The greater tendency to low blood pressures in the women was found in the younger age groups. Up to the age of 60, half or more

of the men had systolic pressures lower than 120, and that of about three fourths never rose above 130. The indications are, they say, that hypertensive men are those who have systolic pressures above 120 appearing at an early age. The authors also presented the continuous blood pressure history of 500 apparently well men examined annually over a period of about ten years. Blood pressures consistently low did not show as much change from year to year as those consistently high. Persons with systolic pressures below 120 rarely changed their level in the direction of a steady rise. In the third phase of this study Robinson and Bruer pointed out that deviations from physiologic norms represent the most accurate check on degenerative processes at work and of potential longevity. If the upper limits of normal pressures are set at 120 systolic and 80 diastolic, a definite parallelism could be observed with the actuarial figures of insurance companies. With a rise in blood pressure there was an abrupt rise in death rate. Pressures, they conclude, of 130 to 144 systolic and diastolic pressures of over 80 cannot be regarded as normal. Accordingly, the popular notion that low blood pressure is a disease and moderately high pressure normal and safe is fallacious. On the contrary, they say, longevity is based on three physiologic levels: low weight, low pulse rate and low blood pressure.

THE MEDICAL SOCIETY OF DELAWARE

One hundred and fifty years ago, twelve days after George Washington took the oath of office as first President of the United States, a group of twenty-seven physicians brought into being the Medical Society of Delaware, the third oldest state medical society and the second oldest medical corporation in the United States. At a recent banquet in celebration of this occasion the speakers were Hon. Richard C. McMullen, governor of Delaware, Dr. Rock Sleyster, of Wauwatosa, Wis., President of the American Medical Association, Dr. L. A. H. Bishop, past president of the Medical Society of Delaware, and Mrs. Rollo K. Packard, of Chicago, National President of the Woman's Auxiliary to the American Medical Association. The Delaware Academy of Medicine exhibited books, instruments, photographs and other articles belonging to the early members of the Medical Society of Delaware. Furthermore, the president of the society, Dr. M. I. Samuel, prepared a special book in connection with the sesquicentennial celebration in which are brief accounts of meetings of the society from year to year, notations on papers read before the fellows, a list of the members of the many committees of the society, a historical account of the early organization, excerpts from presidential addresses, biographies and portraits of the society's presidents, short descriptions of the hospitals in the state of Delaware, and records of the health laws and medical practice acts. The cooperation of the Medical Society of Delaware with the state legislature has brought about laws which safeguard the health of that community and insure to the people high standards of medical care.

1. Robinson, Samuel C., and Bruer, Marshall: Range of Normal Blood Pressure, *Arch. Int. Med.* 64: 409 (Sept.) 1939.

ORGANIZATION SECTION

THE NATIONAL PHYSICIANS' COMMITTEE FOR THE EXTENSION OF MEDICAL SERVICE

On November 18, in Chicago, a formal meeting of an executive board officially launched a new organization, the National Physicians' Committee for the Extension of Medical Service. At this meeting the following officers were elected: Dr. Edward H. Cary, Dallas, Texas, chairman; Dr. Austin A. Hayden, Chicago, secretary, and Dr. N. S. Davis III, Chicago, treasurer. These officers were given authority to act as a management committee for the new organization.

A central committee of more than 800 physicians is being formed, in which all the states will be represented. Some of those already listed in the central committee include Drs. Howard Morrow, San Francisco; Charles W. Mayo, Rochester, Minn.; Herman L. Kretschmer, Chicago, and Charles Gordon Heyd and Haven Emerson, New York.

The organization is an independent one, not affiliated in any way whatever with the committee sponsored by Mr. Frank Gannett under the management of Dr. Edward A. Rumely or with the so-called Committee of Physicians or with the American Medical Association. The functions will not, it is stated, overlap or infringe on those of existing county, state or national medical organizations. For its finances, this organization depends wholly on voluntary contributions from physicians, dentists, nurses, hospitals, pharmacists and lay groups interested in the maintenance of the private practice of medicine. In literature released by the Management Committee, the reasons for forming this new institution are stated as follows:

Medicine is confronted with two new sets of conditions. On the one hand, widespread unemployment, low farm income, and the continuation of conditions of general depression have made it difficult for an ever increasing number of people to pay for the best medical service and proper hospitalization out of earnings.

On the other hand, there is the trend—worldwide in scope—toward governmental paternalism and the false, suicidal doctrine that the "state" can provide a service and a security that the people cannot otherwise obtain. As related to medicine, the implementing of this concept would effect revolutionary changes in both the practice of medicine and the underlying philosophy

which has given it the dynamic quality that resulted in worldwide leadership.

If the ethical and scientific standards are to be maintained, the independence of American medicine preserved and the public interest best served, American physicians must:

1. Make possible the providing of medical service to the indigent and those in the low income groups, and insure the most widespread distribution of the most effective methods and equipment in medicine and surgery.

2. Assume the responsibility of countering destructive propaganda by familiarizing the public with the facts in connection with the methods and the achievements of American medicine.

The objectives are embodied in a motion, unanimously adopted by the directors:

Resolved, That the National Physicians' Committee for the Extension of Medical Service is a nonprofit, nonpolitical organization for maintaining ethical and scientific standards and extending medical service to all the people . . . and for . . . cooperating with lay and medical institutions and groups, interested in the preservation of national health, to make more generally known the achievements and to safeguard the independence of American medicine.

A broadgauge nationwide educational program has been planned and the preliminary steps have been taken to put it in operation. An effort will be made to familiarize the public with the aims, the methods and the effectiveness of American medicine. It is believed that this will result in generally improving health conditions and will tend to offset propaganda that is altering the point of view of the individual and adversely affecting the status of the physician.

The Executive Board includes Dr. Edward H. Cary, Dallas, Texas; Dr. Austin Hayden, Chicago; Dr. N. S. Davis III, Chicago; Dr. Irvin Abell, Louisville, Ky.; Dr. F. F. Borzell, Philadelphia; Dr. William F. Braasch, Rochester, Minn.; Dr. John A. Hartwell, New York; Dr. Roger I. Lee, Boston; Dr. Alphonse McMahon, St. Louis; Dr. E. H. Skinner, Kansas City, Mo., and Dr. Charles B. Wright, Minneapolis.

Mr. John M. Pratt has been secured as executive administrator. The offices are at 700 North Michigan Avenue, Chicago.

THE A. M. A. PROGRAM

[Editorial from the Providence Sunday Journal, Nov. 19, 1939]

The American Medical Association has come out with a program of principles for solving the nation's health problems without resorting to federal government control and compulsory freedom and corollary responsibility under democracy's looser system. It is seen and keenly appreciated again, as if it were a new discovery, that the free and responsible individual who is the unit of government is a far different person than the man or woman who is the creature of government.

Everybody talks about democracy and the menaces to it these days. Regimentation of life in certain foreign countries induces a wholesome, overdue reexamination of the values of individual freedom and corollary responsibility under democracy's looser system. It is seen and keenly appreciated again, as if it were a new discovery, that the free and responsible individual who is the unit of government is a far different person than the man or woman who is the creature of government.

But it is not so clearly seen that regimentation can come to a people insidiously, in beneficent guise, as well as through the compulsion of a recognized and feared dictatorship; that, for example, the eager pursuit of social objectives which are intrinsically admirable may require dangerous strengthening and extension of the federal power, debilitation of the states as sovereign entities which are closer to the people and further destruction of individual responsibility, self reliance and freedom of action.

To the extent that that occurs democracy is damaged, and it is for that reason that it is decidedly in point to study proposed approaches to the national health problem with the preservation of democracy in mind.

The federal government, from motives of paternalism or bureaucracy, has a well developed penchant for patting the

citizen on the head—extracting money from his pocket, of course, to pay for the gesture. There are some who would now have it wipe his nose and extract some more money, this paternalism being in the form of compulsory sickness insurance. It would further decrease his economic freedom of action, but no thought is given to that. It would further decrease his responsibility and capacity for taking care of himself on his own initiative, and it would alter, perhaps profoundly, his traditional and important relationship to the medical profession, which exists for and because of his needs as a private citizen and human creature rather than as a ward of government. But no thought is given to that, either.

The fact is that the advocates of head patting and nose wiping want, or at least are willing to accept, a socialized nation as the price of paternalism. The battle with them therefore ought to be waged on that front. Health is not the issue; democracy is. As a matter of fact the prime public problem in the United States today is not at all the health of the citizens; the prime problem is the decidedly poor health that the federal government is enjoying. The latter is obese with bureaucracy and ravenously hungry for more taxes to satisfy its self-generated, insatiable appetite. It ought to be put on a programmatic diet before it eats us out of house and home. Is there a doctor in the house?

OFFICIAL NOTES

ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Arrangements have been completed for the second Annual Congress on Industrial Health sponsored by the American Medical Association, which will be held Monday and Tuesday, Jan. 15 and 16, 1940, at the Palmer House in Chicago.

Topics and speakers are as follows:

OPENING SESSION, MONDAY MORNING, 9:45

Report of the Council on Industrial Health.

STANLEY J. SEEGER, M.D., Chairman, Milwaukee.

Vocational Rehabilitation in Relation to Medical Practice and Workmen's Compensation Procedure.

TERRY C. FOSTER, U. S. Office of Education, Washington, D. C.

Industrial Psychiatry and Mental Hygiene.

LYDIA G. GIBERSON, M.D., New York.

Adequate Nutrition for the Industrial Worker.

LELA E. BOONER, Ph.D., U. S. Department of Agriculture, Washington, D. C.

MONDAY AFTERNOON, 2:15

SYPHILIS IN INDUSTRY

Syphilis in Industry with Special Reference to Its Incidence and Relation to Trauma.

EARL D. OSBORNE, M.D., Professor of Dermatology and Syphilology, University of Buffalo School of Medicine, Buffalo.

Syphilis Case Finding in Industry.

ALBERT E. RUSSELL, M.D., Surgeon in Charge, Office of Syphilis Control in Industry, U. S. Public Health Service, Chicago.

Integrating Syphilis Control Between the Industrial and the Private Practitioner.

HAROLD A. VONACHEN, M.D., President, Central States Society of Industrial Medicine and Surgery, Peoria, Ill.

Syphilis and Employment.

HARVEY BARTLE, M.D., Chief Medical Examiner, Pennsylvania Railroad, Philadelphia.

MONDAY EVENING, 6:30

An informal dinner and round table discussion, intended primarily for members of state and county medical society committees on industrial health, will be held. The subject matter for discussion will include problems of organization and plans for future activity.

TUESDAY MORNING, 9:30

PHYSICAL EXAMINATIONS

Objectives of Health Examinations and Their Industrial Applications.

McIVER WOODY, M.D., President, American Association of Industrial Physicians and Surgeons, New York.

The Private Practitioner and Industrial Physical Examinations.

RAYMOND HUSSEY, M.D., Chairman of Committee on Industrial Health, Medical and Surgical Faculty of the State of Maryland, Baltimore.

The Wisconsin Plan for Physical Examinations in Industry:

The Point of View of the Industrial Commission.

HARRY A. NELSON, Director, Workmen's Compensation, Industrial Commission of Wisconsin, Madison, Wis.

Scope and Methods of Industrial Physical Examinations of the Wisconsin Plan.

PAUL A. BREHM, M.D., Chairman of the Medical Subcommittee on Physical Examinations in Industry, Industrial Commission of Wisconsin, Madison, Wis.

TUESDAY AFTERNOON, 2 O'CLOCK

DISABILITY EVALUATION

Hearing Loss—Estimation of Disability.

AUSTIN HAYDEN, M.D., Chairman Consultants on Audiometers and Hearing Aids, Council on Physical Therapy, American Medical Association, Chicago.

Present Status of Estimating Disability from Visual Loss.

HARRY S. GRADLE, M.D., Chicago.

Are Uniform Standards of Disability Evaluation Practicable?

EARL D. MCBRIDE, M.D., Oklahoma City.

Critique of Disability Evaluation.

HENRY H. KESSLER, M.D., Newark, N. J.

WEDNESDAY, JANUARY 17

On the day following the Congress on Industrial Health, the Chicago Medical Society will conduct all day clinics illustrating practical problems in industrial medicine and traumatic surgery at St. Luke's Hospital in Chicago. These programs are under the direction of Drs. JAMES A. BRITTON and HARRY E. Mock respectively.

On the same day the Chicago Medical Society will conduct a dinner and evening meeting to be addressed by DR. VILRAY P. BLAIR, St. Louis, on "Treatment of Facial Deformities Caused by Injury."

Further details regarding these presentations will be available to registrants at the congress, all of whom are invited to participate in the programs.

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES

The regular fall meeting of the Board was held during the day and evening of November 16 and on November 17.

MEETINGS OF BOARD OF TRUSTEES WITH REPRESENTATIVES OF OTHER ORGANIZATIONS

A joint meeting of the Board of Regents of the American College of Surgeons and the Board of Trustees of the American Medical Association was held, at which numerous subjects of mutual interest were discussed, some of which were referred for further study to a committee to be appointed by the two organizations.

Arrangements were made for a meeting of representatives of the American, Catholic and Protestant hospital associations with the Executive Committee of the Board of Trustees in December and for a meeting of representatives of the American Society of Clinical Pathologists with the Executive Committee in January.

REPORT OF COMMITTEE ON AMERICAN HEALTH RESORTS

A report from the Committee on American Health Resorts recommending that information on health resorts in the United States be assembled was presented and adopted.

REPRESENTATION ON COMMITTEE OF AMERICAN FILM CENTER, INC., AND ON ADVISORY BOARD OF AMERICAN CAMPING ASSOCIATION, INC.

Dr. W. W. Bauer was authorized to accept membership on the Committee on Public Health Films of the American Film Center, Inc., and on the Advisory Board of the American Camping Association, Inc.

PLATFORM FOR HEALTH AND MEDICAL CARE

A platform for the American Medical Association was established indicative of the trend which the Association believes should be followed in the development of health activities and medical care for the people of the United States, and authorization was given for its publication in THE JOURNAL.

NATIONAL PHYSICIANS' COMMITTEE FOR THE EXTENSION
OF MEDICAL SERVICE

Authorization was given for the publication in *THE JOURNAL* of a brief statement relative to the organization and purposes of a committee known as the National Physicians' Committee for the Extension of Medical Service; also for the publication of a communication relative to the Committee of Physicians.

CONFERENCE ON NOMENCLATURE

The Board authorized the calling of a conference early in 1940 for the revision of the Standard Classified Nomenclature of Disease.

OMISSION OF "COL." AFTER THE NAMES OF NEGRO PHYSICIANS
IN AMERICAN MEDICAL DIRECTORY

Instructions were given for the omission of the designation "col." after the names of Negro physicians in the next edition of the American Medical Directory.

VOTE OF THANKS FOR SPACE FOR EXHIBIT OF *HYGEIA*
AT NEW YORK WORLD'S FAIR

A vote of thanks was extended to Dr. Martin A. Couney for the prominent space made available to the Association for an exhibit of *Hygeia* in the Incubator Building at the New York World's Fair, which was visited by 275,000 persons in 1939.

Other business before the Board was concerned with the general affairs of the Association.

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

- December 4—Cole County Medical Society Auxiliary, Jefferson City, Mo.
December 5—Stephens College, Convocation, Columbus, Mo.
December 5—Boone County Medical Society, Columbus, Mo.
December 7—Greene County Medical Society, Woman's Auxiliary, Springfield, Mo.
December 12—Emmett Parent Teacher Association, Chicago.
December 12—Junior Chamber of Commerce, Clinton, Iowa.

DR. MORRIS FISHBEIN:

- December 6—Chamber of Commerce, Duluth, Minn.
December 6—Industrial Safety Conference, Duluth, Minn.
December 11—Mothers' Aid, Chicago.
December 13—Forum and Medical Society, Frankfort, Ky.
December 14—Louisville District Dental Society and Jefferson County Medical Association, Louisville, Ky.

DR. R. G. LELAND:

- December 1—Phi Beta Pi Fraternity, Rush Medical College, Chicago.
December 7-10—American Public Welfare Association, Round Table Conference on Medical Care, Washington, D. C.
December 13—Des Moines Public Forum, Des Moines, Iowa.

DR. ROCK SLEYSER:

- December 5—Medical Society of South Carolina, Charleston, S. C.

DR. PAUL A. TESCHNER:

- December 4—National Committee on Boys and Girls Club Work, 4 H Movement, Meeting, Chicago.
December 6—High School, Peru, Ind.
December 6—Junior High School, Peru, Ind.
December 6—Parent Teacher Association, Peru, Ind.
December 8—Milwaukee County Medical Society Auxiliary, Milwaukee.
December 13—Kane County Medical Society, Elgin, Ill.

DR. NATHAN B. VAN ETEN:

- December 5—South Carolina Medical Association, Charleston.
December 19—The New York County Medical Society, New York.

RADIO BROADCASTS

The seventh season of broadcasting by the American Medical Association over the facilities of the National Broadcasting Company and affiliated stations is now underway with programs scheduled each Thursday at 4:30 p. m. eastern standard time (3:30 central standard time, 2:30 mountain time and 1:30 Pacific time). The program is on the Blue network of the National Broadcasting Company, whose key station is WJZ, New York.

The title of the program is *Medicine in the News*. It is a fast moving, varied, dramatized program based each week on an important news item from *THE JOURNAL*, a state medical journal or other reputable medical publication, or *Hygeia*. Each program will also include the week's medical highlight, which will be either an interesting, amusing or unusual incident, or a series of brief news items taken from current medical literature.

Each week's program will include a question received from a lay inquirer by the American Medical Association. These questions will be of timely, seasonal interest or of universal appeal. The question will be asked at the opening of the program and answered at the close of the program.

It is not possible to state definitely exactly the stations which are taking the program. A list of stations on the Blue network was published in *THE JOURNAL*, October 28. Inquiries should be made of the local station by a committee of the county medical society or the auxiliary. The advantages of the program and its interest to the public should be called to the attention of the station management by the local medical society or auxiliary.

The following radio stations have signified their intention of broadcasting *Medicine in the News*, according to information received from the National Broadcasting Company, November 24:

New England States

WNBC New Britain, Conn.
WLBZ Bangor, Me.
WEAN Providence, R. I.

Middle Atlantic States

WABY Albany, N. Y.
WBEN Buffalo
WJTN Jamestown, N. Y.
WJZ New York
WMFF Plattsburg, N. Y.
WSAN Allentown, Pa.
WLEU Erie, Pa.
WKEO Harrisburg, Pa.
WGAL Lancaster, Pa.
WFIL Philadelphia
KDKA Pittsburgh
WORK York, Pa.

East North Central States

WENR Chicago
WGL Fort Wayne, Ind.
WBOW Terre Haute, Ind.
WBCM Bay City, Mich.
WXYZ Detroit
WFDF Flint, Mich.
WIBM Jackson, Mich.
WJMI Lansing, Mich.
WSAJ Cincinnati
WING Dayton, Ohio
WIBA Madison, Wis.

West North Central States

KSO Des Moines, Iowa
KMA Shenandoah, Iowa
KSCJ Sioux City, Iowa
WREN Lawrence, Kan.
KANS Wichita, Kan.
KYSM Mankato, Minn.
WTCN Minneapolis
KROC Rochester, Minn.
KFAM St. Cloud, Minn.
KWK St. Louis
KSOO Sioux Falls, S. D.

South Atlantic States

WCOA Pensacola, Fla.
WAGA Atlanta, Ga.
WSOC Charlotte, N. C.
WTAR Norfolk, Va.
WRTD Richmond, Va.
WCKV Charleston, W. Va.
WBLK Clarksburg, W. Va.

East South Central States

WAVE Louisville, Ky.
WAPO Chattanooga, Tenn.
WROL Knoxville, Tenn.

West South Central States

WJBO Baton Rouge, La.
KTOK Oklahoma City
KFDM Beaumont, Texas
KTSM El Paso, Texas
KGKO Fort Worth, Texas
KXYZ Houston, Texas
KRGV Weslaco, Texas

Mountain States

KTAR Phoenix, Ariz.
KVOA Tucson, Ariz.
KVOD Denver
KGHF Pueblo, Colo.
KOB Albuquerque, N. M.
KLO Ogden, Utah
KUTA Salt Lake City

Pacific States

KECA Los Angeles
KFSD San Diego, Calif.
KGO San Francisco
KTMS Santa Barbara, Calif.
KEX Portland, Ore.
KJR Seattle
KGA Spokane

Canada

CFCF Montreal

WOMAN'S AUXILIARY

Illinois

The auxiliary to the Bureau County Medical Society met at Spring Valley September 12 at the home of Mrs. M. A. Nix. A donation of \$50 was made to the Crippled Children's Clinic.

The auxiliary to the Coles-Cumberland Counties Medical Society met at Mattoon September 20. Mrs. W. R. Rhodes of Toledo addressed the group on the national and state public health service.

The auxiliary to the Sangamon County Medical Society held an Acquaintance Day Luncheon September 11. The first regular program was held September 25 at the home of one of the members. A review of the September issue of *Hygeia* was given.

New York

The auxiliary to the Nassau County Medical Society met in the Nassau Hospital Auditorium September 20. The auxiliary is cooperating with the County Cancer Committee. At the auxiliary meeting held on September 26 Miss Muriel Bliss, chairman of the Nassau County Committee on Cancer, was guest speaker.

The first meeting of the auxiliary to the Medical Society of Saratoga County was held October 3 in Schuylerville. Addresses were given by physicians on the subjects colds and pneumonia and the importance of hospitals to communities. Auxiliaries to the medical societies of Sullivan County and of Washington County have recently been organized.

Texas

An executive board meeting of the auxiliary to the State Medical Association of Texas was held in Dallas September 21. Mrs. S. H. Watson, Waxahachie, president, reports that forty-one members attended the meeting. —Taylor-Jones Counties Auxiliary will provide one month's maintenance for a needy student at the Texas State College for Women, Denton. —The Central Texas District Auxiliary met in Cleburne recently. Mrs. F. F. Kirby, past president of the state auxiliary,

and Mrs. L. B. Leake, treasurer, gave addresses. The auxiliary was entertained at a joint luncheon with its district medical society at the First Methodist Church. On this occasion Dr. L. H. Reeves, president of the state medical association, was the speaker.

Utah

The board of directors of the auxiliary to the Utah State Medical Association met in Provo October 12. A history of the pioneer physicians of Utah will be prepared by the auxiliary under the direction of Mrs. Walter M. Stookey, past president. The auxiliary will send delegates to the Legislative Council, which meets once each month at the State Capitol in Salt Lake City.

The auxiliary to the Carbon County Medical Society met at the Carbon Country Club October 7. Mrs. Bliss Finlayson of Price will arrange radio programs for the auxiliary.

The auxiliary to the Utah County Medical Society held its first autumn meeting at the home of Mrs. Arnold Robinson in Provo. Plans were made to place *Hygeia* in every grade and high school in the county.

Washington

The auxiliary to the Clark County Medical Society met at the home of Mrs. Charles Otto on the Evergreen Highway overlooking the Columbia River October 3. Plans are being made for the placing of *Hygeia* in reading rooms of public schools.

The auxiliary to the Grays Harbor Medical Society held its September meeting in Aberdeen. Copies of the pamphlet "On the Witness Stand" were distributed.

The September meeting of the auxiliary to the King County Medical Society was held at the Woman's University Club, Seattle. A membership tea was given at the home of Mrs. L. L. Stephens in October, at which time many new members were welcomed. Members of the county *Hygeia* committee have visited outlying communities near Seattle, securing subscriptions for *Hygeia*.

MEDICAL ECONOMIC ABSTRACTS

GROUP HOSPITALIZATION IN WAYNE COUNTY

The Wayne County Medical Society has recommended to its council that the plan offered by the Michigan society for group hospitalization be made available to members of the county medical society.

The Michigan Society for Group Hospitalization was organized by the hospitals of Michigan. It is a nonprofit organization; the members of the board of trustees receive no reimbursement for their services; all employees of the society are on a straight salary basis, and no fees or commissions are paid to representatives. The seventy-eight participating hospitals guarantee the services provided for in the subscriber's certificate—no assessment is possible. The subscriber is assured of hospital service at cost, as the certificate provides that any surplus accruing in the operation of the plan will be returned to the subscribers in the form either of reduced rates or of increased benefits. Ordinarily the plan is available only to groups of ten or more employed people through their place of employment, but special arrangements have been made to make the service available to members of the medical society.

There are no age limits for adults, no physical examination required and no exemptions for chronic conditions. In case of an emergency a subscriber may go to any hospital in the world, and if he holds a ward certificate he will receive \$4.50 a day toward his hospital bill or \$6 a day if he holds a semi-private certificate. The seventy-eight hospitals that guarantee the service are located in forty-one Michigan cities. During the five months that the plan has been in operation 45,000 subscribers have been enrolled.

The county medical society members are now being circulated with an application blank which is also intended as a referendum to determine whether the members approve the plan and if so are willing to enroll.

THE ORDER OF PHYSICIANS IN PORTUGAL

A little more than a year ago the Belgian medical profession was made a legal organization in which every licensed physician is required to hold a membership. Similar legislation was enacted in Germany and Italy, shortly after these became totalitarian states. Portugal has now enacted a similar law, a copy of which appears in the *Presse médicale* for August 12, 1939, page 1239.

The provisions of the Portuguese law creating an "integrated" profession make legal some of the provisions of medical ethics. This is true also in the legislation of the other countries. For example, the physician is required "to respect the customs and local traditions with relation to his patients, and to act with loyalty with regard to his colleagues, and to conduct conscientiously his professional and social duties." All species of advertising, including interviews with the press which tend to attract a clientele, are absolutely forbidden. Pharmacists, chemical laboratories, drug stores or any establishments for the sale of pharmaceutical products and all similar institutions are strictly forbidden to give any sort of medical consultations or prescriptions.

The form of organization, including the management of the order by regular conventions and the form of administration to be set up, are prescribed in the law.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Regional Meeting.—The Northwestern Division of the Alabama State Medical Association will meet in Parrish December 7. At this meeting plaques will be awarded by the Walker County Medical Society to Dr. Charles B. Jackson, Jasper, posthumously, for fifty-three years of distinguished service to the medical profession and to Dr. Hugh W. Stephenson, Oakman, commemorating sixty years of active practice. The speakers will include Drs. Glenn I. Jones, Washington, D. C., on "Railroad Medical Service"; James A. Meadows and Karl F. Kesmodel, Birmingham, "Diagnosis of Cancerous Lesions"; Thompson F. Wickliffe, Jasper, "Virus Diseases"; Sam P. Wainwright, Birmingham, "The Thymus Gland," and Gilbert B. Greene, Birmingham, "Surgical Management of Thyrotoxicosis."

CALIFORNIA

Course for Practitioners.—The University of California Medical School, San Francisco, will offer a course for general practitioners at the University of California Hospital, San Francisco, Jan. 3-6, 1940. The course has been designed to meet the needs of the physician in private practice. Patients, lantern slides and pathologic material will be used to illustrate the discussions.

Society News.—At the annual meeting of the Los Angeles County Medical Association, December 7, Dr. George Franklin Farman will discuss the "History of the Urologic Section and Its Relationship to the Los Angeles County Medical Association," and Dr. Herman L. Kretschmer, Chicago, "The Present Status of Transurethral Resection."—The Los Angeles Society of Neurology and Psychiatry was addressed November 15 by Drs. Clarence W. Olsen on "Injury to the Spinal Cord Incident to Hypodermic Injection," and Samuel D. Ingham, "Neurologic Interpretations of Convulsive Symptoms."—At a meeting of the Los Angeles Society of Ophthalmology and Otolaryngology November 27 the speakers were Drs. Leland R. House on "Cysts in the Maxillary Sinus" and Cyril B. Courville, "Prodromal Syndrome of the Intracranial Extension of Middle Ear and Mastoid Infection."

COLORADO

Society News.—Dr. Robert K. Dixon, Denver, discussed gastro-enterology before the Northeast Colorado Medical Society in Sterling October 12.—At a meeting of the Delta County Medical Society in Delta October 27 Dr. Lawrence L. Hick discussed "Recent Advances in the Treatment of Pneumonia."—The Larimer County Medical Society was addressed in Fort Collins November 1 by Dr. Foster L. Matchett on "Orthopedic Approach to Low Back Pain" and "Internal Fixation of Broken Hips."—The Washington-Yuma Counties Medical Society met in Yuma October 20; the speakers were Drs. Lyman W. Mason on "Pelvic Infections" and Ward Darley Jr. on "Advancement in Diagnosis and Treatment of Cardiac Diseases."—Dr. Henry A. Buchtel, Denver, discussed "Urology and Treatment of Urologic Diseases" at a meeting of the Weld County Medical Society in Greeley November 6.

CONNECTICUT

Society News.—Arne Tiselius, Ph.D., Institute of Physical Chemistry, University of Uppsala, Uppsala, Sweden, discussed "The Application of Electrophoresis Methods to Some Problems in Biochemistry and Medicine" before the Yale Medical Society October 25 under the auspices of the Jane Coffin Childs Memorial Fund for Medical Research.—Dr. Lee E. Farr, New York, discussed "Studies of Nitrogen Metabolism in Children with the Nephrotic Syndrome" before the Yale Medical Society November 8.

Discussions on Pneumonia.—The Connecticut State Medical Society and the state department of health announce a series of programs on the treatment of pneumonia to be given in cooperation with the following medical societies: Bridgeport, Central, Danbury, Greenwich, Hartford, Manchester, Meriden,

New Britain, New London, New Haven, Norwalk, Norwich, Torrington and Waterbury. Dr. Louis H. Nalium, New Haven, opened the series November 16. Other speakers will include:

Dr. Chester S. Keefer, Boston, December 4, in New Britain.
Dr. Russell L. Cecil, New York, December 6, in Hartford.
Dr. Francis G. Blake, New Haven, December 7, in Norwich.
Dr. Blake, December 13, in Danbury.
Dr. John A. Wentworth, Hartford, December 14, in Waterbury.
Dr. Theodore S. Evans, New Haven, December 19, in Greenwich.
Dr. Thomas P. Murdock, Meriden, December 20, in Middletown.
Dr. Blake, December 20, in Norwalk.
Dr. Samuel J. Goldberg, New Haven, January 3, in Meriden.
Dr. Clarence L. Robbins, New Haven, January 3, in Litchfield.
Dr. Blake, January 26, in Manchester.
In Bridgeport March 5, speaker to be announced.

DISTRICT OF COLUMBIA

Society News.—Forest Ray Moulton, Ph.D., permanent secretary, American Association for the Advancement of Science, Washington, D. C., discussed "A Jaundiced Look at the Human Machine" before the Academy of Medicine of Washington October 27.—Dr. Louis H. Clerf, Philadelphia, discussed "Diagnostic Information Derivable from Bronchoscopy" before the naval medical and dental officers on duty in the district at a meeting in the naval medical school November 6.

New Professor of Psychiatry at Georgetown.—Dr. Harry Stack Sullivan, New York, president of the William Alanson White Psychiatric Foundation and faculty chairman of the Washington School of Psychiatry, has been appointed professor of psychiatry and director of the department of psychiatry and neurology at Georgetown University School of Medicine. He succeeds the late Dr. Daniel Percy Hickling, who was a member of the faculty of Georgetown for more than forty years. Dr. Sullivan graduated at the Chicago College of Medicine and Surgery in 1917. He served as associate professor of psychiatry at the University of Maryland School of Medicine from 1923 to 1930 and concurrently as director of clinical research at the Sheppard and Enoch Pratt Hospital, Baltimore.

ILLINOIS

Postgraduate Conference.—Physicians of the seventh, eighth and eleventh councilor districts in cooperation with the Illinois State Medical Society are cooperating in a postgraduate conference to be held in Champaign December 7. The subjects planned for discussion in this conference, which is the second of a new program planned by the state society, include:

The Fundamentals in the Use of Sulfanilamide and Its Allied Compounds in Infection, Dr. Oswald H. Robertson.
Recent Developments in the Treatment of Diabetes Mellitus, Dr. Robert W. Keeton.
Cardiac Emergencies and Their Treatment, Dr. Carlo S. Scuderi.
The Treatment of Athlete's Foot and Other Fungous Infections of the Skin, Dr. Francis E. Seneac.
The Treatment of Common Ailments in Children, Dr. Robert A. Black.
Physical Therapy, Dr. John S. Coulter.
The Management of the Male and Female Climacteric, Dr. James H. Hutton.
The Treatment of Head Injuries, Dr. Harry Mock.
Why, When and How to Immunize, Dr. Harry Leichenger.
Treatment of Common Disorders of the Upper Respiratory Tract, Dr. Francis L. Lederer.

All the speakers are from Chicago.

Society News.—Dr. James H. Hutton, Chicago, addressed the Lawrence County Medical Society at Lawrenceville November 1 on "Classification and Management of the Nervous Hypotensive Patient."—At a meeting of the Sangamon County Medical Society in Springfield November 2 Dr. Vernon C. David, Chicago, spoke on "Carcinoma of the Sigmoid and Rectum."—Dr. Milton H. Kronenberg, Chicago, read a paper before the Winnebago County Medical Society at Rockford November 3 entitled "The General Practitioner's Approach to Industrial Hygiene."—Dr. Benjamin M. Levin, Chicago, discussed "Surgical Diseases of Childhood" before the Bureau County Medical Society in Princeton November 21.—Dr. Irving L. Turow, Peoria, was elected president of the Physicians' Association of the Illinois State Department of Public Welfare at its meeting in Peoria October 12; Dr. George L. Perkins, Manteno State Hospital, was chosen vice president and Dr. Jacob W. Klapman, Chicago State Hospital, was reelected secretary-treasurer.—Dr. Roland M. Klemme, St. Louis, discussed "Surgical Treatment of Parkinson's Disease" before the Champaign County Medical Society, November 9.

Chicago

Society News.—Among the speakers before the Chicago Laryngological and Otological Society December 4 were the following: Drs. J. Allan Weiss on "Mucocele of the Frontal

Sinus"; Robert Henner, "Endaural Complete Mastoidectomy and Attico-Mastoidectomy," and Frank J. Piskiewicz, "Nasopharyngeal Tuberculosis"; all are members of the staff of the Illinois Eye and Ear Infirmary.—A symposium on the treatment of prostatism was presented before the Chicago Urological Society November 30 by Drs. Herman L. Kretschmer, Harry C. Rolnick and Gustav Kolischer.

University News.—Ralph H. Müller, Ph.D., New York, opened a series of six lecture-conferences and demonstrations at the University of Chicago November 6 on "Electronics in Chemistry and Technology."—The Tuberculosis Institute of Chicago and Cook County through the Theodore B. Sachs Memorial Fund has made \$1,000 available to support a study on bronchiectasis and pulmonary abscesses at the University of Illinois College of Medicine. The work is being conducted by Drs. Felix Basch of the department of pediatrics and Paul H. Holinger of the department of otolaryngology.

INDIANA

University Aids City Dispensary.—The Indianapolis Board of Health has approved an arrangement whereby the Indiana University Medical Center, Indianapolis, will give the city hospital dispensary \$10,000 annually to improve the service and the teaching facilities for the school of medicine. Two full time physicians have been named to the dispensary by the university, Drs. Joseph Edward Tether Jr. and August M. Hasevinkle, and two more will be added. With the increased full time staff it is hoped to make unnecessary the return visits by patients to the dispensary. The staff also will be able to treat the patients more rapidly by systematizing appointments. For its assistance, the medical school will be compensated by improved and increased teaching facilities in the dispensary for medical students.

Society News.—Dr. James A. Britton, Chicago, discussed "Medicine in Industry" before the Indianapolis Medical Society October 24. At a meeting October 31 the speakers were Drs. Ethelbert R. Wilson on "The Coroner's Role in Medico-legal Investigation"; John T. Day, "Causes of Chronic Gonorrheal Infection," and Verne K. Harvey, "The Epidemiology of Rocky Mountain Spotted Fever."—At a meeting of the Fountain-Warren Counties Medical Society in Kingman in October Dr. James O. Ritchey, Indianapolis, discussed goiter.—The Fort Wayne Medical Society was addressed October 3 by Drs. Lester L. Eberhart, Angola, on "Treatment of Hip Fracture by Internal Fixation"; Max M. Gitlin, Bluffton, "Undulant Fever," and Thomas O. Dorrance, Bluffton, "Scurvy in Infants."—Drs. Matthew Winters, Indianapolis, and Charles F. Thompson, Indianapolis, discussed "Diarrheas in Infancy" and "Causes of Delayed Walking" before the Shelby County Medical Society in Shelbyville October 4.

KANSAS

Postgraduate Course.—A postgraduate course on syphilis and gonorrhea was started early in November under the auspices of the state board of health and the committee on control of venereal disease of the Kansas Medical Society. It is planned to devote three months to this program so that two lectures each on syphilis and gonorrhea will be presented at a central location in each of the twelve councilor districts. Dr. Arthur D. Gray, Topeka, is the lecturer.

LOUISIANA

Extension Program.—The Graduate School of Medicine of Louisiana State University, New Orleans, inaugurated its 1939-1940 extension program with a symposium on pneumonia before the Franklin Parish Medical Society at Winnsboro November 15. The speakers were Drs. John R. Schenken on "Pathology and Pathogenesis of Pneumonia"; Robert H. Bayley, "Diagnosis and Differential Diagnosis of Pneumonia," and Joseph O. Weilbaecher Jr., "Treatment of Pneumonia."

MARYLAND

Society News.—Dr. John M. McDonald, Baltimore, discussed "Occupational Health Hazards of the Industries in Maryland" before the Medical and Chirurgical Faculty of Maryland October 24.—At a meeting of the Baltimore City Medical Society October 20 Drs. John Sheldon Eastland spoke on "Use of Vitamin K in Obstructive Jaundice" and Nicholson J. Eastman, "Vitamin K and the Newborn."—The Maryland Academy of Medicine and Surgery was addressed October 17 in Baltimore by Drs. Maurice Feldman, Baltimore, on "Aneu-

rysms of the Abdominal Aorta"; Charles W. Maxson, "Early Treatment of Fractures," and J. Bernard Wells, state's attorney, "The Doctor on the Stand."

Dr. Corner to Head Department of Embryology.—Dr. George W. Corner, since 1924 professor and chairman of the department of anatomy of the University of Rochester School of Medicine, Rochester, N. Y., has been appointed director of the department of embryology of the Carnegie Institution of Washington, effective May 1, 1940, on the retirement of Dr. George L. Streeter, who joined the Carnegie staff in 1914 and became director of the department of embryology in 1917. The Carnegie laboratory of embryology is located in Baltimore. Dr. Corner was born in Baltimore. He graduated at Johns Hopkins in 1913. Before going to Rochester in 1924 he served as assistant professor at the University of California Medical School and associate professor at Johns Hopkins. He has been curator of the Rochester Medical Library since 1938, was secretary-treasurer of the American Association of Anatomists from 1930 to 1938 and since early this year has been managing editor of the *American Journal of Anatomy*.

MASSACHUSETTS

Postgraduate Courses.—The Massachusetts Medical Society, cooperating with the state department of health, the U. S. Public Health Service and the Federal Children's Bureau, opened its fall series of medical postgraduate extension courses in October. They will continue at weekly intervals until December.

Harvard Will Not Abandon Dental School.—To correct a rumor that has been circulating, Harvard University announces that plans are not under way to abandon its dental school after seventy years' existence. According to Dr. Leroy M. S. Miner, dean of the dental school, a plan is under consideration involving a new program of dental education, but this does not include the abandonment of the dental school. The usual first year class was accepted this year with a full quota of students and this class will be carried through the entire four years under the present framework, it was stated. According to a release from the university, there is no truth in the statement as applied to the present situation, or to the contemplated new plan, that "All candidates contemplating the study of dentistry must first enroll and qualify by acquiring the degree of doctor of medicine, before entering on the study of dentistry." It was pointed out that whatever new plan is adopted it will still be possible for men to qualify for general dental practice and to satisfy requirements for licensure. The statement that the university is going to discontinue teaching prosthetic and other forms of restorative dentistry and confine itself simply to preparing men for surgery and other specialties is not true. The dental profession may rest assured that any modifications in the curriculum now under consideration will, if put into effect, be expected to elevate the importance of dentistry as a profession and neither to lower its standards nor to diminish its effectiveness, it was stated.

MICHIGAN

Symposium on Poliomyelitis.—The Wayne County Medical Society sponsored a symposium on poliomyelitis at the Detroit Institute of Art November 13. The speakers were:

Dr. Edgar E. Martner, Clinical Aspects and Diagnosis.
Dr. Franklin H. Top, Epidemiology.
Dr. Joseph A. Kasper, Virology and Pathology of Anterior Poliomyelitis.
Dr. Alfred D. LaFerte, After-Treatment from Orthopedic Standpoint.

Hospital Day.—Woman's Hospital, Detroit, sponsored a "hospital day" November 8. The speakers included Drs. George M. Curtis, Columbus, on "The Iodine Metabolism in Thyroid Disease, Emphasizing the Clinical Aspects"; William Boyd, Toronto, Canada, "Some Reasons for the Recent Increase of Bronchial Carcinoma"; John L. McKelvey, professor of obstetrics and gynecology, University of Minnesota Medical School, Minneapolis, "A Study of the Remote Lesions of the Pregnancy Toxemias and Their Clinical Significance"; Arthur H. Parmelee, Chicago, "Practical Points in the Management of the Newborn." Dr. Boyd discussed "Cause and Effect in Disease" at the dinner meeting in the evening.

Changes in Health Officers.—Dr. Fred O. Tonney, Washington, D. C., and formerly with the city health department of Chicago, has been assigned as health commissioner of Delta County during the leave of absence of Dr. Roelof Lanting, Escanaba. Dr. Clifton F. Hall, Topeka, Kan., director of the division of tuberculosis control for the state board of health, will serve as director of the Mecosta-Osceola health department during the absence of Dr. Max C. Igloe, Big Rapids,

who is studying at Johns Hopkins University, Baltimore. While Dr. Lloyd H. Gaston, Sandusky, director of the Sanilac County department of health, is pursuing a course at Yale University during the coming months, Dr. James A. Dolce, Allegan, will serve as acting director.

MINNESOTA

Dr. McQuarrie Goes to Peiping.—Dr. Irving McQuarrie, professor and head of the department of pediatrics at the University of Minnesota School of Medicine, Minneapolis, will go to China about January 1 to serve as visiting professor in pediatrics at Peiping Union Medical School, according to the *Journal-Lancet*. Dr. McQuarrie was granted a leave of absence by the university board of regents and will return to the university next year, it was stated.

Course in Neurologic Roentgenology.—The University of Minnesota, Minneapolis, sponsored a course in neurologic roentgenology at the Center for Continuation Study November 13-15. The speakers included:

Andrew T. Rasmussen, Ph.D., and Dr. Leo G. Rigler, Minneapolis, Anatomy of Brain, Skull and Spine.
Dr. James W. Kernohan, Rochester, Pathology of Tumors of the Brain and Spinal Cord.
Dr. Cornelius G. Dyke, New York, Normal Encephalogram and Ventriculogram.
Dr. John D. Camp, Rochester, Normal and Abnormal Sella.
Dr. Merrill C. Sosman, Boston, Meningiomas and Lesions of the Cerebrum Including Fractures.
Dr. Harold O. Peterson, Minneapolis, Platybasia; Encephalography in Spastic, Mentally Deficient and Epileptic Children.

A symposium on tumors of the brain was presented by Drs. Sosman, John Charnley McKinley, Minneapolis, and Alfred W. Adson, Rochester, and one on protruded intervertebral disks by Drs. Maurice N. Walsh, Ralph K. Ghormley, J. Grafton Love, Rochester, and Dr. Camp. A clinical pathologic conference was conducted by Drs. Dyke, Camp, Peterson, Sosman and Abe B. Baker, Minneapolis.

MONTANA

Personal.—Dr. Enoch M. Porter, Great Falls, has been named vice president of the state board of health, filling the unexpired term of the late Dr. Louis H. Fligman, Helena. —Dr. Patrick E. Kane, Butte, has been appointed a member of the state board of medical examiners for a term to end March 2, 1945. He succeeds the late Dr. John A. Donovan.

NEW YORK

Hospital Superintendents Transferred.—Dr. John A. Pritchard, superintendent of Buffalo State Hospital, Buffalo, has been transferred to the superintendency of the St. Lawrence State Hospital, Ogdensburg, to succeed Dr. Paul G. Taddiken. Dr. Willis E. Merriman, head of Manhattan State Hospital, has been transferred to the Utica State Hospital.

Society News.—Dr. Eugene N. Boudreau, Syracuse, addressed the Onondaga County Medical Society, Syracuse, November 7 on "The Medical and Social Challenge of Alcoholism"; Dr. Robert C. Schwartz reported a case of Laurence-Moon-Biedl syndrome (blindness of pituitary origin). —Drs. Edward S. and John Van Duyn II addressed the Syracuse Academy of Medicine November 21 on "Pulmonary Atelectasis Following Severe Trauma" and Clayton A. Sayers, D.D.S., on "The Relation of the Physician to Orthodontia."

Health Supplement.—The second annual health section of the Nassau *Daily Review-Star* was published October 31. All the material in the supplement, which consisted of forty pages in tabloid style, was approved before publication by the Nassau County Medical Society. The first article in the section described in detail the organization setup and activities of the American Medical Association. One of the other important articles dealt with the National Health Program and pointed out the position of the medical profession in relationship to the program.

New York City

Society for Study of Syphilis.—The New York office of the U. S. Public Health Service is sponsoring the formation of a Society for the Study of Syphilis for all physicians in the city who are interested in diagnosis and treatment of syphilis. The basic program will be by and for the general practitioner. Informal meetings are planned at which physicians may discuss their problems.

Annual Hospital Campaign.—The United Hospital Fund is conducting its sixty-first annual campaign for funds to meet the needs of the ninety voluntary hospitals that are members

of the organization. The amount needed this year is \$2,462,618, it was announced. Money received in the campaign is distributed through a special committee which allots funds to member hospitals on the basis of free care rendered, special needs and budgetary requirements of their women's committees. The greater part is used to provide free care for the needy.

Dr. Squier Retires.—Dr. J. Bentley Squier, professor of urology, Columbia University College of Physicians and Surgeons since 1917, has retired, the *New York Times* reports. Dr. Squier, 66 years old, took his medical degree at Columbia in 1894 and was professor of genito-urinary surgery at Columbia York Post-Graduate Medical School from 1909 to 1924. He has in recent years been director of the Squier Urological Clinic at Presbyterian Hospital, consulting surgeon to St. Luke's Hospital and consulting urologist to Roosevelt Hospital and the Neurological Institute. He was president of the American Urological Association in 1913 and of the American Association of Genito-Urinary Surgeons in 1919.

Hospital Lecture Series.—The Journal Club of Montefiore Hospital began its lecture season October 5 with an address by Dr. Esmond R. Long, Philadelphia, on "Primary Tuberculosis in the Adult." Dr. John F. Fulton, New Haven, spoke November 8 on "The Hypothalamus," and Dr. Hugh R. Butt, Rochester, Minn., November 30 on "The Use of Antihemorrhagic Substance (Vitamin K) in the Treatment of Hemorrhagic Diathesis Associated with Hypoprothrombinemia." Other lectures that have been announced are:

Drs. Alexander B. Gutman, Clinical and Chemical Aspects of Hyperparathyroidism; and Henry L. Jaffe, Pathology of Hyperparathyroidism, Jan. 17, 1940.
Dr. Virgil H. Moon, Philadelphia, Shock: Its Mechanism, Pathology and Occurrence, February 7.
Dr. Francis Peyton Rous, Viruses and Tumor Causations, February 28.
Dr. Maurice Lenz, Radiotherapy: Its Actions and Medical Application, March 18.

Society News.—Drs. Richard B. Cattell, Boston, and Frank E. Adair addressed the Medical Society of the County of Queens October 31 on "Carcinoma of the Colon and Rectum" and "Treatment of Cancer of the Breast" respectively. —Drs. Herbert M. Evans, Berkeley, Calif., and James B. Collip, Montreal, Canada, addressed the Medical Society of the County of New York October 23 on "Historical Sketch of the Development of Endocrinology" and "Physiology of the Anterior Lobe of the Pituitary Gland" respectively. —A symposium on "Inflammatory Lesions of the Colon" was presented before the New York Surgical Society October 25 by Drs. Carl Eggers, John H. Garlock, William Howard Barber and Wallace B. Murphy. —Drs. Edwin F. Gray and Murray M. Friedman, among others, addressed the New York Roentgen Society November 20 on "Roentgen and Histologic Studies of Calcification in the Spleen" and "Anomalies of the Cervical Spine" respectively. —Drs. Dorothy H. Andersen and Jean R. Oliver addressed the New York Pathological Society November 30 on "Renal Parathyroidism in Childhood" and "The Architecture of the Amyloid Kidney" respectively. —Drs. Frank R. Smith and Oswald S. Lowsley addressed the Harlem Medical Association November 1 on "Cancer in Gynecology" and "Newer Aspects of Urologic Surgery" respectively.

NORTH CAROLINA

Personal.—Dr. Joseph B. Greene, Asheville, was honored at a testimonial dinner November 8 following his retirement from active practice. Dr. Jere E. Cocke was toastmaster and with Drs. John La Bruce Ward and Paul H. Ringer described Dr. Greene's practice of nearly fifty years.

Diploma Lost.—Dr. Milton Carpenter Cobcy, Washington, D. C., who graduated from Duke University School of Medicine, Durham, Sept. 1, 1934, has recently lost his diploma bearing that date. The university has notified the association that a new diploma has been issued to Dr. Cobcy.

New Building to Be Opened at Carolina.—A new Medical Laboratories Building is to be opened December 4 at the University of North Carolina, Chapel Hill, as part of the university's sesquicentennial celebration. The exercises will begin with an address in the morning by Dr. Eli K. Marshall, Jr., Baltimore, on "Medical Research: The Story of Sulfanilamide." In the afternoon Dr. David Riesman, Philadelphia, will speak on "The Making of a Clinician" and Dr. G. Canby Robinson, Baltimore, on "The Application of Medical Science to the Individual." Then will follow an informal tea in conjunction with the inspection of the medical laboratories and the medical dormitory. At a dinner in the evening Dr. Frank

G. Boudreau, executive director of the Milbank Memorial Fund, New York, will speak on "New Health Frontiers." Greetings will be brought to the university and medical school by various alumni and friends.

OKLAHOMA

Society News.—The Tulsa Cancer Society presented a symposium on "Malignancies of the Breast" before the Garfield County Medical Society, Enid, October 26; the speakers were Drs. Ralph A. McGill, Davy L. Garrett, Carl J. H. Hotz, Ivo A. Nelson, Arnold D. Piatt and Harry D. Murdock. All are from Tulsa.

New County Health Officers.—The state health commissioner recently announced appointment of the following new health officers:

Dr. William E. Seba, Leedey, of Dewey County.
Dr. Rudolph H. Dnevall, Miami, of Ottawa County.
Dr. Leo R. Evans, Pryor, of Mayes County.
Dr. James T. McInnis, Muskogee, of Muskogee County.
Dr. O. Hiram Cowart, Bristow, of Creek County.
Dr. Ivan E. Bigler, Ada, of Pontotoc County.

OREGON

Society News.—A program on common eye diseases, sponsored by the Oregon Academy of Ophthalmology and Otolaryngology, was presented before the Multnomah County Medical Society, Portland, November 1 by Drs. Edgar Merle Taylor, Augustus B. Dykman and Frederick A. Kiehle. All are of Portland. Drs. Joyle O. Dahl, and Morton J. Goodman, Portland, addressed the county medical society, Portland, November 15 on "Significance of Serological Reports for Syphilis" and "Prevention and Management of Reactions and Complications of Syphilotherapy" respectively.

PENNSYLVANIA

Postgraduate Meeting at Danville.—The annual fall postgraduate assembly at Geisinger Hospital, Danville, was held October 20 with the following program:

Dr. Charles W. Mayo, Rochester, Minn., Carcinoma of the Right Half of the Colon.
Dr. Arthur W. Allen, Boston, Diagnostic Clinic.
Dr. Russell L. Cecil, New York, Treatment of Pneumonia.
Dr. Harold L. Foss, Danville, End-Results Following Surgical Treatment of Carcinoma of Rectum.
Dr. Roy E. Nicodemus, Danville, Management of Occiput Posterior Positions.

Philadelphia

Tuberculosis Conference.—The annual Philadelphia Tuberculosis Conference, sponsored by the Philadelphia Health Council, the department of public health, the Philadelphia County Medical Society, the Pennsylvania Tuberculosis Society and the Philadelphia Association of Tuberculosis Clinics and other agencies, was held November 14 at the Ritz-Carlton Hotel. At the morning session Dr. Esmond R. Long led a discussion of "Tuberculosis Testing and X-Ray Examinations"; Mrs. Sadie Orr Dunbar, Portland, Ore., president of the General Federation of Women's Clubs, was among the speakers at the luncheon, and Dr. Samuel J. Dickey, director of the tuberculosis division of the state department of public health, Harrisburg, spoke on "Tuberculosis from an Administrative Standpoint."

Pittsburgh

Society News.—Speakers at a meeting of the Allegheny County Medical Society November 21 were Drs. James Leroy Foster on "The Feeding of Infants and Children"; Joseph M. Cameron, "An Autogenous Serum for the Treatment of Menstrual Migraine"; Eben W. Fiske, "Functional Treatment of Fractures and the Combined or Rotating Traumatic Service," and George J. Kastlin, "Effects of Certain Drugs on the Hematopoietic System."

SOUTH CAROLINA

County Society to Celebrate Sesquicentennial.—The Medical Society of South Carolina, which embraces the territory of Charleston County, will celebrate its sesquicentennial anniversary in Charleston December 5 with a historical exhibit and a banquet. The exhibit will be at the Gibbs Art Gallery, showing paintings, books, prints and other material relating to the society's background and its early members. Mayor Henry W. Lockwood of Charleston and Governor Burnet R. Maybank will make addresses of welcome at the banquet, which is to be held at the Francis Marion Hotel. Dr. James J. Ravenel, Charleston, president of the society, will give a historical sketch of the society. Dr. Douglas Jennings, Bennetts-

ville, president of the South Carolina Medical Association, will bring greetings, and Dr. William Weston, Columbia, will present a tablet from the state association. Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, will speak on "An American Health Program" and Dr. Francis R. Packard, Philadelphia, editor of the *Annals of Medical History*, on "Scientific Links Between Charleston and Philadelphia in the Eighteenth Century." The Medical Society of South Carolina was founded Dec. 24, 1789, the first and for many years the only medical organization in the state. The society from its beginning conducted a public dispensary and now owns and operates the Roper Hospital. It also started a collection of books in its early days. In 1822 a medical college was established under the auspices of the society, which conducted the school until it assumed its present status and name, the Medical College of the State of South Carolina. Two medical journals, the *Carolina Journal* and the *Southern Medical and Surgical Journal*, were products of the members of the medical society, according to an announcement. The society still has the original minutes of its meetings from the time of its establishment and the new member today signs his name in the book in which the minutes of the first meeting were written.

TEXAS

Personal.—Dr. Houston H. Terry, formerly of Fort Worth, has been appointed director of the health unit of Cooke County. —Dr. John G. Young, Dallas, has been selected as chief of staff of the Texas Children's Hospital now under construction, it is reported.

Society News.—At a meeting of the Dallas County Medical Society November 9 the speakers were Drs. Charles D. Bussey on "Meckel's Diverticulum—a Pathological and Clinical Study of 155 Cases"; James Howard Shane, "Cold Punch Type Transurethral Prostatic Resection," and Merritt B. Whitten, "Midaxillary Leads in the Electrocardiogram in Infarction and Hypertension."

WASHINGTON

Children's Library Is Memorial to Physician.—A library of children's books is being placed in the Spokane unit of the Shriners' Hospital for Crippled Children as a memorial to the late Dr. Mitchell Langworthy. A fund was collected shortly after Dr. Langworthy's death in 1929 but was saved until a new hospital was built. From this fund a room has been furnished as a library and schoolroom and books have been bought. Dr. Langworthy was chief surgeon of the hospital from 1926 till 1929, when he was shot and killed at the age of 38 by a patient.

Society News.—Dr. Kenneth K. Sherwood, Seattle, addressed the Walla Walla Valley Medical Society, Walla Walla, at its November meeting on "Pathology and Treatment of Chronic Arthritis."—A symposium on cardiac conditions was presented at a meeting of the King County Medical Society, Seattle, November 6 by Drs. Charles E. Watts, who discussed "Cardiac Arrhythmias"; Raymond H. Somers, "Approach to the Cardiac Problem in Children," and Austin G. Friend, "The Heart Patient."—Dr. Frank S. Miller addressed the Spokane County Medical Society, Spokane, November 9 on tuberculosis.

Executives' Conference.—The second annual meeting of the Pacific States Medical Executives' Conference will be held in Seattle December 10. Membership in this conference includes officials of the state medical associations of California, Oregon, Idaho, Washington and Montana. It is expected that representatives may come this year from Arizona, Nevada and Utah. Dr. Harry E. Rhodehamel, Spokane, is president. Matters selected for discussion include: professional societies (the Oregon Plan), medical service plans, malpractice defense problems, prospective health legislation, public relations, prospective public health and practice laws of the Pacific states, postgraduate medical education.

WISCONSIN

County Secretary for Thirty-Five Years.—Dr. Mina B. Glasier, Bloomington, resigned as secretary of the Grant County Medical Society October 31 after serving continuously for thirty-five years. Dr. Glasier was a member of the state board of health for fourteen years. In 1932 she received the Council Award of the State Medical Society of Wisconsin for meritorious service.

Society News.—Dr. David R. Lyman, Wallingford, Conn., was guest speaker at the banquet during the annual meeting of the Wisconsin Anti-Tuberculosis Association in Milwaukee

October 26, giving a memorial address on the late Dr. Hoyt E. Dearholt, for many years executive secretary of the association. Dr. Paul A. Teschner, assistant director, Bureau of Health Education, American Medical Association, Chicago, led a panel discussion on the problem of finding early diagnosis. —Dr. David A. Cleveland, Milwaukee, addressed the Marinette-Florence County Medical Society, Menominee, October 18 on "Head and Spinal Injuries." —Drs. Milton Trautmann, Madison, and Frances A. Cline, Rhinelander, addressed the Oneida-Vilas County Medical Society, Rhinelander, November 2 on "Modern Treatment of Venereal Disease" and "Polio-myelitis" respectively.

GENERAL

Fraternity Convention.—The Phi Delta Epsilon Medical Fraternity will hold its thirty-sixth annual convention at the Waldorf-Astoria Hotel, New York, December 29, 30 and New Year's Eve. About 600 physicians and medical students from this country and Canada will attend. Dr. Morris Fishbein, Editor of *THE JOURNAL*, who is national president, will preside at the sessions.

Help Wanted in Finding Illegal Practitioner.—The prosecuting attorney of the Seventeenth Judicial District of Indiana requests the help of the medical profession in apprehending a man wanted on charges of abortion and illegal practice of medicine. Under the name of Ferdinand Werner, this man has maintained an office in Richmond, Ind., as a pathologist and bacteriologist and has practiced medicine without a license. After many efforts, evidence was obtained recently



to support thirteen charges of illegal practice against him and later charges of abortion were filed. The abortion charge was set for trial in the Wayne Circuit Court November 13, but Werner did not appear, forfeiting a \$2,000 bond. No date has been set for trial on the other charges, but authorities believe Werner will forfeit a \$1,300 bond on these charges. Routine check of the man's fingerprints revealed that he had been convicted of a crime involving moral turpitude in Cleveland in 1923, sentenced to the state penitentiary, from which he escaped in February 1924. Shortly afterward he was employed in the department of pathology and bacteriology at Indiana State University School of Medicine for less than three months and later at the State Hospital for the Insane at Richmond. He was discharged from the latter position when the superintendent learned Werner was not his real name and when his services were found unsatisfactory. He then opened his own laboratory in Richmond. When Werner was convicted in Cleveland he was using the name Sternisa and further inquiry brought out the fact that he had come to the United States under the name of Hribar. The Indiana authorities believe that because of Werner's medical work he will undertake such work again and will have contact with the medical profession. If he is identified, the person making identification is asked to telegraph the information collect to the prosecuting attorney's office at Richmond. The description given by police is as follows: 42 years old; 5 feet 11¼ inches tall; weight 197 pounds; black hair, brown eyes and fair complexion.

Fellowships for Study of Crippled Child.—For the third year the Nemours Foundation will award five or six one-year fellowships for laboratory or clinical studies on the crippled child, to begin on or after July 1, 1940. The term "crippled child" is used in its broadest sense, according to the announcement. The amount of each individual award will be from \$1,000 to \$2,400 and will be determined on the basis of the

previous training of the applicant and the type of research project selected. Application blanks may be obtained from the secretary of the research committee, Dr. Alfred R. Shands Jr., 803 Delaware Trust Building, Wilmington, Del.

Southern Surgical Meeting.—The fifty-second annual session of the Southern Surgical Association will be held in Augusta December 5-7 with headquarters at the Forest Hills Hotel. Among the speakers will be:

- Dr. Waltman Walters, Rochester, Minn., Operative and Postoperative Infections with Special Reference to Air-Borne Bacterial Contaminations.
- Dr. Barney Brooks, Nashville, Tenn., Present Status of the "Radical Operation" for Carcinoma of the Breast.
- Dr. Carrington Williams, Richmond, Va., Hysterical Edema of the Hand and Forearm.
- Dr. Warfield M. Piror, Baltimore, Treatment of Addison's Disease by Implantation of Synthetic Hormone.
- Dr. Thomas D. Sparrow, Charlotte, N. C., Leukoplakic Vulvitis.

At the annual dinner Dr. Hubert A. Royster, Raleigh, N. C., will be toastmaster and Dr. Albert O. Singleton, Galveston, Texas, will deliver the presidential address on "The Surgeon in the Romantic Story of Texas."

Grants for Research in Endocrinology.—Requests to the National Research Council committee for research in endocrinology for aid during the fiscal period from Sept. 1, 1940, to June 30, 1941, will be received until Feb. 29, 1940. In addition to a statement of the problem and research plan or program, the committee desires information regarding the proposed method of attack, the institutional support of the investigation and the uses to be made of the sum requested. No part of any grant may be used for administrative expenses. Applications for aid of endocrine research on problems of sex in the narrower sense cannot be given favorable consideration, but the committee will consider support of studies on the effects of hormones on nonsexual functions, for instance, on metabolism. Application blanks may be obtained by addressing the division of medical sciences, National Research Council, 2101 Constitution Avenue, Washington, D. C.

CANADA

Personal.—Dr. Allan C. Rankin, dean of the University of Alberta Faculty of Medicine, Edmonton, has joined the military forces of Canada and Dr. John James Ower has been made acting dean for the present session.

Society News.—Prof. George Grey Turner, London, England, addressed the Academy of Medicine of Toronto, October 12 on "Difficulty in Swallowing." A symposium on the problems related to automobile driving was presented before a joint meeting of the section on preventive medicine and hygiene and the section of neurology and psychiatry by Drs. Kenneth G. Gray on the medicolegal and financial aspects; Robert G. Armour, the neurologic problems, and L. Joslyn Rogers, M.A., the problem of alcohol. —Dr. Howard C. Taylor Jr., Philadelphia, addressed the Academy of Medicine of Toronto November 7 on "Relationship of the Ovarian Hormone to Reproductive Tract Tumors."

LATIN AMERICA

Poliomyelitis in Brazil.—A cable to the *New York Times* October 20 reported that 115 cases of poliomyelitis with six deaths had occurred in Rio de Janeiro. It was announced that the government was taking measures to prevent spread of the disease.

Society News.—Dr. Francisco Ferreira has been elected president of the Society of Ophthalmology and Otolaryngology of Bahia, Brazil, and Dr. Adroaldo de Alencar secretary. Correspondence should be addressed to the president, Pitanguieras 15, Brotas, San Salvador, Bahia, Brazil.

Leprosarium in Cuba.—The cornerstone was laid recently for a new hospital for lepers near Alto Songo, Orienta, Cuba. It is expected that the new institution will be completed by September 1940. It will accommodate 400 patients and will be designed to permit enlargement to care for 400 more. The building will cost about \$380,000.

FOREIGN

Nobel Prizes Awarded.—The 1939 Nobel Prize in chemistry was recently awarded jointly to Prof. Adolph Butenandt of the University of Berlin and Prof. Leopold Ruzicka, Zurich, Switzerland, for their work on hormones. The 1938 chemistry prize was awarded at the same time to Prof. Richard Kuhn of the Kaiser Wilhelm Institute, Berlin, for his work on carotinoids and vitamins. The *New York Times* reported November 11 that Professor Butenandt and Professor Kuhn had declined the prizes because of the ban placed on the Nobel Prizes by the Nazi government.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 1, 1939.

The Teeth of the Nation Are Bad

The excellent physique of our people and the great improvement in health in recent years, as shown by a lower death rate, infant mortality, maternal mortality and tuberculosis mortality are frequent themes. The good physique of the many thousands of young men called up when this country had recently to adopt conscription is the latest confirmation. But there is one profoundly unsatisfactory condition. Addressing the Public Health Services Congress last year the minister of health said "The teeth of this country are bad; you might almost say they are rotten." In his presidential address to the British Dental Association Mr. T. Walkinshaw laid the blame on our insufficient public dental-health service. We have a school dental service but prevention should begin with the pregnant woman and young children and there is little or no provision for this. Hence the average child enters school with his teeth in an appalling condition. Further, no provision is made for treatment during adolescence. It is curious that in all the discussion of this pressing problem, including that by a leading medical journal, no attempt seems to be made to get to the root of the matter. Why is dental caries so prevalent in civilized countries, while it is absent in people living under primitive conditions? Recent studies in diet appear to furnish an answer. About the middle of the nineteenth century the stone grinders for wheat gave place to steel rollers which remove the whole of the germ and almost all the bran, giving a flour deficient in protein, fat, vitamins A and B and minerals (calcium, phosphorus and iron). In an important book recently published, "The Englishman's Food: A History of Five Centuries of English Diet," the authors (Prof. J. C. Drummond and A. Wilbraham) attribute the appalling prevalence of dental caries to the poorness of white bread in minerals, the reduction in the consumption of milk (with the use of the cheaper forms of condensed milk) and the decline of breast feeding. "Time and again examples can be found of communities with excellent teeth so long as they lived on natural and unrefined foods, but soon after the introduction of highly milled white flour caries appeared."

The Complications of Intranasal Surgery

In a discussion on the complications of intranasal surgery at the Section of Laryngology of the Royal Society of Medicine, Mr. E. D. D. Davis said that a good view of the interior of the nose was essential for operations and that anything in the nature of a blind operation was undesirable. He called attention to four kinds of injuries that had happened in spite of careful technique: perforations and injuries to the roof of the nose or to the cribriform plate, injuries to the orbit and its contents, injury to the optic nerve and injury to the nasolacrimal duct.

Six cases of perforation of the roof of the nose had been recorded and he had seen seven in consultation. They occurred during removal of nasal polypi with forceps or during operation with forceps on the ethmoidal cells for sinus suppuration. The perforation in the removal of polypi was always in the region of the posterior ethmoidal cells, when the forceps was directed upward and backward. It was avoided by directing the point parallel to the roof of the nose. The operator might be unaware that the roof of the nose had been perforated, but escape of cerebrospinal fluid or profuse hemorrhage would be a warning. The patient suffered from shock and after delayed recovery from the anesthetic complained of intolerable headache and was restless and drowsy. Coma rapidly supervened and death occurred within three days, before meningitis had time to develop.

The necropsy showed hemorrhage from the posterior ethmoidal artery into the anterior fossa of the skull. The treatment was the external ethmoidal operation and covering the opening in the dura by a fascial graft. The perforation was inaccessible through the nose.

Hemorrhage into the orbit following perforation of the thin os planum of the ethmoid was the commonest injury. It frequently happened during the ethmoidal operation, particularly on the anterior cells and also in the intranasal frontal sinus operation. The "black eye" was typical and the ecchymosis was maximal at the inner canthus, but if the hemorrhage was considerable the eyeball might protrude. This might be increased by emphysema. All that was necessary in most cases was to keep the patient at rest in the sitting posture, with the eye covered by a pad and bandage. The patient should be forbidden to blow his nose for a few days.

Injury to the optic nerve in ethmoidal operations produced immediate blindness. Davis had been able to collect reports of five cases and had seen two of the patients. One injury was caused by evulsion of the middle turbinal and part of the ethmoid in an operation for polypi. Optic atrophy followed, with permanent loss of sight. Such cases showed the need for care in the use of the forceps for evulsion. It was safer to use cutting or punch forceps kept in a plane parallel to the outer wall of the nose.

Injury to the nasolacrimal duct had been seen on two occasions following an intranasal antral operation. The window made in the nasal wall of the antrum extended into the middle meatus above the attachment of the inferior turbinal, severing the duct. On recovering from the operation the patients complained of blood leaking into the eye. Epiphora and lacrimal obstruction followed. After injection of the lacrimal sac with iodized oil, x-ray examination showed stricture of the duct in the middle meatus of the nose. The epiphora was relieved by a dacryocystostomy done above the stricture.

PARIS

(From Our Regular Correspondent)

Oct. 25, 1939.

Plasma Transfusion

P. Brodin and F. Saint Girons, before the Société médicale des Hôpitaux de Paris, stressed the advantage of using not the whole blood but only the plasma in severe hemorrhages. According to their view the danger of hemorrhage lies less in the loss of the erythrocytes than in the loss of the volume of blood. When this is reduced to one fourth, death is inevitable. In war times it may not be possible to use only living blood and recourse to stored blood may be necessary. This involves dangers. R. Benda, at the same meeting, reported the history of a woman aged 52 who had undergone five transfusions of fresh blood within six months in large doses and who died six hours after slow injection of 100 cc. of stored blood of group O taken sixteen days previously. This indicates that stored blood may become toxic and cause fatal hemolysis after a certain time, varying according to the particular case. To avoid these accidents, the origin of which is probably determined by the type of the blood, only the plasma is kept, after centrifugation and separation from the red corpuscles. The plasma can be stored for weeks and months. Unlike the serum, the plasma is not toxic, even if applied to different blood groups. Professor Pittaluga, of Madrid, before the Société de chirurgie, expatiated on the lessons learned regarding blood transfusion during the three years of civil war in Spain. Whether intended for immediate use or for conservation, the blood was subjected to the customary tests including the test for malaria. The blood of universal donors never caused accidents. It is important, he said, to store the blood at a constant temperature of 37.4 F., which required special equipment. Under these conditions its usefulness could be extended to two weeks. Reheated at 100.4 F.

and slowly injected, shocks rarely resulted from the transfusion. Neumann, of Brussels, added confirmation to these observations from his extensive experience.

Effect of Radium on the Tubercle Bacillus

In one of the last sessions of the Académie des sciences, P. Bonet-Maury and H. R. Olivier discussed the effects of the use of radium on the behavior of tubercle bacilli. Their method consists in dissolving the total radiation of the radon in a microbial suspension. With powerful doses the respiration of the irradiated bacillus continues, though reduced to about one sixth, for several days. The bacilli are in a state of "postponed death," still alive but no longer virulent. Owing to the destruction of bacillary virulence while keeping the bacilli alive, the authors were able to bring about the immunization of guinea pigs. In man they obtained encouraging therapeutic results with safety. This "radium vaccine" engenders hopes of interesting developments in the immunization against tuberculosis and in its treatment.

BUCHAREST

(From Our Regular Correspondent)

Oct. 14, 1939.

The Closing of Some Dental Laboratories

The minister of public health has ordered the closing of 123 dental laboratories which were conducted by dental technicians in violation of the law. In 1923 dental technicians obtained permission to practice. However, the law issued by former Minister Saveanu deprived some of them of practice on the ground that they obtained their permission illegally. The dental technicians attacked the law on the ground that it violated their rights, but the supreme court upheld the law. Thereupon a long controversy arose between dental surgeons and dental technicians. The litigation came to an end by the issue of the Moldovan law in 1930. This law favored some dental technicians in that those who in 1930 had been in practice for fifteen years, could take a one year theoretical and practical course and then be examined for license to practice. Those who had practiced fifteen years and already were 42 or more years of age were absolved from attending the course and needed only to pass the examination. As 123 dental technicians did not fulfil this requirement, the minister of health ordered their laboratories to be closed.

Committees Appointed by the Ministry of Health

The government some time ago empowered the Ministry of Health to appoint technical committees to study public health problems and to make proposals regarding most urgent matters needing attention. In all, nineteen committees have been appointed to study typhus fever, malaria, eugenics, maternity and child welfare, insurance against tuberculosis, cancer, venereal diseases, rheumatism, malnutrition and deficiency diseases, and dentistry with especial attention to the function of dental technicians. Committees are also being appointed to stimulate the campaign against alcoholism and trachoma, to promote the standardization of biologic products and to investigate means of fostering international relations in health matters.

Professor Daniel Honored

The Faculty of Medicine of the University of Bordeaux celebrated the conferring on Constantin Daniel, professor of obstetrics and gynecology at the Buearest University, of the degree of doctor honoris causa. The diploma and the insignia were handed to him in the presence of the deans of all the faculties of Bordeaux University and notables of the city of Bordeaux. Prof. Gabriel Boussagol, rector of the Bordeaux Academy, and Prof. Josef Guyot eulogized the Rumanian savant. Thereupon Prof. Constantin Daniel read an elaborate paper on the influence of French medical sciences on the Rumanian universities.

BERLIN

(From Our Regular Correspondent)

Nov. 1, 1939.

Homeopathy and Lay Practitioners

The Deutscher Centralverein homöopathischer Aerzte recently commemorated its hundredth session. Among the speakers was Prof. Paul Martini, clinician in Bonn, who is known for his thorough critical reexaminations of the therapeutic value of substances designated as medicaments. Retests were necessary, he said, because homeopathy had been vindicated of late years in a number of cases at the hands of the national socialist party, converting some physicians from an attitude of rejection to one of uncritical assent. Plans are being made by the public health department of the reich to conduct an extensive examination of all homeopathic curative procedures.

Recently a meeting also took place of the movement for German public health in Stuttgart. This body represents the so-called lay practitioners (heilpraktiker). Their status in the reich was recently regulated by law (THE JOURNAL, June 10, p. 2449). The presiding officer made several peculiar statements; e. g., that the union between medicine taught in schools and lay medical practice was now completed, the former in future taking over the experiences of lay practitioners; that lay practitioners rejected occult methods as employed in healing by prayer and in remote treatment in accordance with specimens of writing, but not magnetic therapy. Besides they adhered, he said, to ocular diagnosis in spite of medical objections. The 5,000 legalized lay practitioners in Germany are determined to be distinguished from the quacks.

The law regarding lay practitioners also affects all persons who treat speech defects with or without psychic methods, those who professionally occupy themselves with psychotherapy and the psychology of healing, with curative gymnastics and with respiratory cures; likewise professional teachers of vision (seh-lehrer), proprietors of schools of vision (seh-schulen) and those who treat fractures (exclusive of purely orthopedic measures) and those who profess to cure leg and foot troubles (exclusive of pedicures).

Significant for the social alinement of lay practitioners, who come from the lower strata of society, was the announcement of one of the highest medical functionaries of national socialism, Dr. Blome, at last year's congress for internal medicine that it was planned to admit lay practitioners to the sick funds. Whether this was feasible was another question, since lay practitioners might not desire it on account of the low compensations granted by the sick funds. Moreover, he and the medical leadership of the party in power would welcome their admission. In this way, he said, it would not always be the sick fund physician on whose back professional questions are fought out; for, in addition to his low fees, many patients hold him responsible for alleged inferior services provided by the sick funds and for many other things. This frank avowal is quite significant for the attitude of those insured toward the sick fund system in Germany. Dr. Blome is the representative of the state medical leader for medical continuation training. In the meantime, lay practitioners have signified their willingness to participate in sick fund insurance with the declaration, however, that they did not surrender their conviction that their services would before long receive a more just compensation. This implies that they expect better fees than the physicians. Privately managed sick funds, which compensate on a higher scale than those of the state, have already admitted lay practitioners. In the Rudolf Hess Hospital in Dresden an "academy for new German medicine" is to be established. Hess, who is close to Hitler, is the great promoter of all unscientific paramedical movements.

AUSTRALIA

(From Our Regular Correspondent)

Oct. 25, 1939.

Community Plan for Medical Services

Contract practice as a private enterprise has now been commenced in Australia. Medical services at Canberra (the federal capital city of Australia) have been reorganized by the introduction of a community plan on a voluntary basis. Five of the doctors who reside in the capital are conducting the scheme, which is open to all residents earning up to £520 a year and their dependents. Contributions are planned on a sliding scale, with a maximum of £3-3-0 a year for persons with an annual income of £520 and £6-6-0 for these people with their dependents. Liberal benefits are to include unlimited medical benefits during illness, a complete medical overhaul every year, a full service for obstetric cases, assistance when necessary at operations, and medical attendance at doctors' offices or in the homes of contributors between the hours of 8 a. m. and 8 p. m. on week days and until 1 p. m. on Saturdays. Disabilities due to misconduct and injuries or sickness already provided for by insurance are not covered by the scheme. Additional fees may be charged for traveling beyond a 4 mile limit and for urgent attention outside specified hours. The British Medical Association in Australia is following the experiment closely. The city already has a government-controlled compulsory hospital benefit scheme.

War Time Measures in Australia

The spread of war in Europe and the potential danger of war in this country have been responsible for greatly increased activity in air raid precaution work and in other schemes for the protection of civilians in times of emergency. Government and voluntary organizations have instituted instruction classes both for officials and for civilians, and plans for the evacuation of each of the larger cities are well in hand. Extensive plans have also been made for the organization of an emergency blood transfusion service. These include provision for the storage of blood if necessary and the grouping, testing and listing of a large number of donors from both the military and the civilian ranks. Special attention is being given to the feeding of the military forces in Queensland. An increased supply of salad vegetables, fruit, eggs and milk, the substitution of whole meal for white bread, and milk and fruit bars in the canteens are new departures at present under consideration. Consideration has also been given to the emergency organization of the medical profession with due regard to both military and civil needs. Special lectures have been arranged for numbers of the profession on war time medicine and surgery.

Birth Rate Recovery by Australia

While many countries at present are faced with the national problem inherent in a net reproduction rate of less than 1, recent statistics reveal that births in Queensland are well above the level required to fill the places of the present generation. Figures for the whole of Australia show that there has been a recovery practically to the displacement level. A separate calculation for Queensland was first made on the 1938 birth registrations and gave the result of 1.09. A calculation for South Australia gave the low figure of 0.85. The latter may be associated with the fact that 54 per cent of the population of that state lives in the metropolitan area. The latest figure for Australia (1937) is 0.99. Comparisons with the net reproduction rates of other countries give Japan (1930) 1.57, Canada (1931) 1.32, Italy (1937) 1.13, the Netherlands (1937) 1.12, Queensland (1938) 1.09, New Zealand (1938) 1.02, Australia (1937) 0.99, the United States (1935 white population) 0.96, Denmark (1937) 0.95, Germany (1936) 0.93, France (1937) 0.87, Great Britain (1937) 0.80, Sweden (1936) 0.76.

Nutrition in New Zealand

New Zealand has the reputation of being a country that produces a healthy and virile people. Recent inquiries have tended to throw some doubt on this generalization. The "protective foods" are still fairly expensive and as a consequence New Zealanders tend to consume meat as their main first class protein and to bulk their diet with white bread, cakes, cane sugar and tea. New Zealanders are the largest meat eaters in the world (about 250 pounds a head annually). This statement is amply borne out by a survey of food consumption for the last few years. Total food consumption divided by total population shows that each person consumes daily from 6 to 7 ounces of sugar, approximately 1 pound of red meat, a half pound of white flour, two thirds of a pint of milk, two thirds of an egg, one-third ounce of cheese and from 2 to 3 ounces of butter (not margarine). Most of the milk is taken by adults in tea and the egg in cakes.

The available evidence suggests that about 97 per cent of the school children show signs of dental caries and that more than 50 per cent of the adults have false teeth. It is also reported that one in every twenty persons in the country is in the hospital every year, chiefly for such complaints as appendicitis, tonsils and goiter. The adult population also suffers to no inconsiderable degree from digestive complaints, rheumatism and neuritis.

It is interesting to note at what age the breakdown in the health of the children begins to occur. Up to the age of 8 or 10 months most of the children seem to be in good condition. After that age it is customary to cut down the amount of milk, cod liver oil and orange juice, with the result that the calories are obtained mainly from refined starches and the resistance of the child tends to decrease. By the time the children are going to school, dental decay has become common. But for the past two years an additional half pint of milk has been supplied daily in the schools, and this is having a beneficial effect.

Another factor which has an influence on the nutrition of New Zealand is the quantity of cakes and pastry that are consumed. No morning, afternoon or evening gathering is complete without an array of these delicacies, and with the great majority of the population (largely female) they constitute the mainstay of the day. The tea drinking habits are the surprise of every visitor; strong tea, often plentifully sugared, accompanies every meal, even dinner.

Summing up the nutritional problems of New Zealand, it is suggested that (1) calories are adequate, (2) first class protein is adequate but ill chosen, and (3) vitamins B₁ and D are sub-optimal, as are iron, calcium and iodine. This situation is brought about by a combination of poor knowledge of nutritional science and of the relatively high price of many of the protective foodstuffs. Home science has always been a feature of the University of Otago, and extension activities are in operation. Nutrition education has been furthered by the Women's Food Value League, on the executive committee of which are British Medical Association members. There are scattered foci of reform such as the Auckland Boy's Grammar School the results of which have been stimulating.

Marriages

ELSIE G. WESTLEY, San Antonio, Texas, to Capt. E. F. Adams of Fort Sam Houston, September 2.

OSCAR MILTON MARCHMAN JR., Dallas, Texas, to Miss Mary Alice Yates of Longview, September 7.

WARREN D. HANSEN to Miss May Wintlers, both of Wisner, Neb., August 25.

WOODROW W. SCHMELA to Miss Dora Larson, both of Omaha, September 3.

Deaths

Martha Wollstein, Grand Rapids, Mich.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1889; at one time demonstrator in histology and demonstrator in pathology at her alma mater; formerly assistant clinical professor of diseases of children and pathology, Columbia University College of Physicians and Surgeons, New York; member of the American Pediatric Society; associate of the Rockefeller Institute for Medical Research from 1906 to 1921; for many years on the staff of the Babies Hospital, New York; aged 70; died, September 30, in the Mount Sinai Hospital, New York.

Allan Joseph Hruby ☉ Chicago; University of Illinois College of Medicine, Chicago, 1913; fellow of the American College of Physicians; school health officer, 1916-1917; dispensary physician to the Chicago Municipal Tuberculosis Sanitarium, 1917-1918, superintendent, 1918-1923, and secretary and member of the board of directors since 1931; aged 49; at various times on the staffs of Cook County Hospital, St. Anthony's Hospital and the Washington Boulevard Hospital, where he died, November 18, of lobar pneumonia.

Herbert Preston Leopold, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1896; clinical professor of surgery at his alma mater; fellow of the American College of Surgeons; surgeon to the Homeopathic State Hospital, Allentown; consulting surgeon to the Coatesville (Pa.) Hospital, West Jersey Homeopathic Hospital, Camden, and the Homeopathic Hospital, Wilmington, Del.; aged 65; died, September 21, at his summer home in Tannersville, Pa., of acute coronary thrombosis.

Milford Levy ☉ Baltimore; College of Physicians and Surgeons, Baltimore, 1915; member of the American Psychiatric Association; assistant professor of neurology at the University of Maryland School of Medicine and College of Physicians and Surgeons; served during the World War; on the staffs of the Mercy, University, South Baltimore General, Sinai, Bon Secours and St. Agnes' hospitals; aged 47; died, October 10, in Pikesville, Md., of rheumatic cardiovascular disease and aortic stenosis.

Michael Matthew Jordan ☉ Worcester, Mass.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1905; member of the American Psychiatric Association and the New England Society of Psychiatry; served during the World War; aged 55; on the staffs of St. Vincent's Hospital and the City Hospital, where he died, September 30, of coronary thrombosis.

Harry Roland Lickle ☉ Baltimore; Maryland Medical College, Baltimore, 1909; assistant in medicine from 1920 to 1923 and instructor in medicine 1923-1924, University of Maryland School of Medicine; on the visiting staffs of the University, Mercy, St. Agnes', Maryland General, Women's and the West Baltimore General hospitals; aged 50; died, September 13, of cerebral hemorrhage.

Oran Idnre Cutler ☉ Loma Linda, Calif.; College of Medical Evangelists, Loma Linda, 1924; professor of pathology and bacteriology at his alma mater; member of the American Society of Clinical Pathologists; on the staffs of the Los Angeles General Hospital, Riverside County Hospital, Arlington, and San Bernardino (Calif.) County Hospital; aged 39; died, September 15.

Frank M. Register, Kinston, N. C.; Kentucky School of Medicine, Louisville, 1893; member of the Medical Society of the State of North Carolina; for many years connected with the state board of health; formerly health officer of Wayne County; medical superintendent of the Caswell Training School; aged 69; died, September 28, of intestinal obstruction and chronic myocarditis.

Edward McCarty Armstrong ☉ Houston, Texas; University of Virginia Department of Medicine, Charlottesville, 1892; fellow of the American College of Surgeons; member of the visiting staff of St. Joseph's Infirmary and Methodist Hospital; surgeon to the Memorial Hospital; consulting surgeon to the Jefferson Davis Hospital; aged 68; died, October 7.

Charles Tilden Howard, Hingham, Mass.; Boston University School of Medicine, 1898; professor emeritus of surgery at his alma mater; member of the Massachusetts Medical Society; fellow of the American College of Surgeons; consulting surgeon to the Massachusetts Memorial Hospitals; aged 67; died, September 6.

Winfield Harrison Ammarell ☉ Birdsboro, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1909; past president of the Berks County Medical Society; at one time county coroner; president of the board of health and member of the school board; aged 56; died, September 1, of Hodgkin's disease.

Albert Ridgeley, Washington, D. C.; Howard University College of Medicine, Washington, 1900; associate professor emeritus of anatomy at his alma mater; for many years health inspector in the public schools; served during the World War; aged 63; died in September at the Veterans Administration Facility.

Albert Edwin Leach, Mount Morris, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1891; member of the Medical Society of the State of New York; health officer; aged 73; died, September 8, in the Wyoming County Community Hospital, Warsaw, of coronary thrombosis.

Fred Allen Fuller, Jacksonville, Texas; University of the South Medical Department, Sewanee, Tenn., 1908; member of the State Medical Association of Texas; aged 55; on the staff of the Nan Travis Memorial Hospital, where he died, October 7, of chronic hypertension and nephritis.

George Holt Barksdale ☉ Charleston, W. Va.; Northwestern University Medical School, Chicago, 1908; served during the World War; fellow of the American College of Physicians; on the staffs of the Charleston General and St. Francis hospitals; aged 57; died, October 8.

Lorenzo W. Swope ☉ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1896; fellow of the American College of Surgeons; for many years on the staff of the Western Pennsylvania Hospital; aged 76; died, September 14, of cerebral hemorrhage and arteriosclerosis.

Winfred Wylie ☉ Phoenix, Ariz.; Rush Medical College, Chicago, 1877; Long Island College Hospital, Brooklyn, 1878; fellow of the American College of Surgeons; past president of the Arizona State Medical Association; also a lawyer; aged 84; died, September 23, in Glendale, Calif.

Louis Augustus Fuerstenau, Milwaukee; Northwestern University Medical School, Chicago, 1909; president of the Milwaukee Society of Clinical Surgery; aged 58; on the staff of St. Mary's Hospital, where he died, September 21, of benign tumor of the pyloric end of the stomach.

George Washington Cassady, Chicago; Jenner Medical College, Chicago, 1900; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 72; on the staff of St. Elizabeth's Hospital, where he died, October 10, of pernicious anemia.

Lot Richard Henry, North Middletown, Ky.; Kentucky University Medical Department, 1902; member of the Kentucky State Medical Association; formerly mayor and member of the school board; aged 65; died, October 9, of coronary occlusion, mitral stenosis and hypertension.

William Stephen Beck, Indianapolis; Medical College of Indiana, Indianapolis, 1888; member of the Indiana State Medical Association; formerly a lawyer; at one time county coroner and secretary of the county board of health; aged 76; died, October 6, of heart disease.

Mary Angela Spink, Indianapolis; Medical College of Indiana, Indianapolis, 1887; member of the Indiana State Medical Association; president and medical director of the Dr. W. B. Fletcher's Sanatorium; aged 75; died, September 3, in Lisbon, N. H., of heart disease.

Robert Swift Patten, Danville, Pa.; Jefferson Medical College of Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; for many years physician for the public schools; aged 65; was found dead in bed, September 26, of coronary thrombosis.

John Macaulay Gunning, Spokane, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 72; died, October 7, at the Deaconess Hospital of chronic myocarditis, mitral regurgitation and cholangitis.

Sarah Louise Weintraub, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1883; member of the Medical Society of the State of Pennsylvania; formerly a medical missionary in Syria; aged 78; died, September 11, in Avalon, N. J.

Joseph Lawrence Morrissey, Elmhurst, N. Y.; Long Island College Hospital, Brooklyn, 1916; served during the World War; aged 48; on the staff of the Flushing (N. Y.) Hospital, where he died, September 12, of acute pancreatitis.

Lawson Walter McKenzie, Washington, D. C.; Medical College of Indiana, Indianapolis, 1904; formerly physician in the insurance service of the Veterans Administration; aged 61; died, September 20, of coronary occlusion and arteriosclerosis.

George R. Herkimer, Dowagiac, Mich.; Hahnemann Medical College and Hospital, Chicago, 1890; served during the World War; at various times member of the school board, and mayor; aged 73; died, October 1, of cerebral embolus.

Irving C. Wood, Omaha; Jefferson Medical College of Philadelphia, 1880; at one time mayor of Logan, Iowa; aged 82; died, September 7, in the Nebraska Methodist Episcopal Hospital and Deaconess Home of myasthenia gravis.

John Jacob Fossler, Millard, Neb.; University of Nebraska College of Medicine, Omaha, 1907; for many years a member of the school board; aged 62; died, September 27, in the Immanuel Hospital, Omaha, of myasthenia gravis.

Loring Watson Turrell, Smithtown Branch, N. Y.; Yale University School of Medicine, New Haven, Conn., 1936; member of the Medical Society of the State of New York; aged 30; died, September 8, of idiopathic pneumothorax.

William Dana Pursel @ Phillipsburg, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; aged 64; died, September 18, in the Easton (Pa.) Hospital of an overdose of morphine, self administered.

John Franklin Calbreath, Portland, Ore.; University of California Medical Department, San Francisco, 1875; member of the Oregon State Medical Society; aged 85; died, October 4, of hemorrhage from an esophageal varix.

Kenneth Israel Hoffman @ New York; Cornell University Medical College, New York, 1921; on the staff of the New York Polyclinic Medical School and Hospital; aged 42; died, October 10, in a local hospital.

George Yerkes Woodland, Philadelphia; Medico-Chirurgical College of Philadelphia, 1895; for many years a medical inspector in the public schools; served during the World War; aged 72; died, September 10.

William S. Higbee, Philadelphia; Jefferson Medical College of Philadelphia, 1883; member of the Medical Society of the State of Pennsylvania; aged 77; died, September 12, in the Methodist Hospital.

Owa O. Hausch, Painesville, Ohio; Cleveland Medical College, 1891; member of the Ohio State Medical Association; for many years county coroner; aged 74; died, October 14, of coronary thrombosis.

Clifford Mitchell, Chicago; Chicago Homoeopathic Medical College, 1878; formerly professor of renal diseases and clinical urology at the Hahnemann Medical College and Hospital; aged 85; died, October 19.

Earl Edgar Miller, Culbertson, Neb.; University of Nebraska College of Medicine, Omaha, 1924; aged 40; died, September 21, in St. Catherine's Hospital, McCook, of increased intracranial pressure.

Benjamin Garleat Benson, Webster Groves, Mo.; St. Louis College of Physicians and Surgeons, 1888; served during the World War; aged 72; died, October 8, of coronary occlusion and arteriosclerosis.

Welland A. Peck, Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; aged 70; died, September 20, of acute endocarditis.

Albert Warren Stearns Jr., Billerica, Mass.; Tufts College Medical School, Boston, 1939; aged 25; died, September 5, in the Huntington Memorial Hospital, Boston, of Ewing's sarcoma of the left ileum.

Amelia Weicksel, Perkasic, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1904; aged 78; died, September 1, in the Grand View Hospital, Sellersville, of cerebral thrombosis and myocarditis.

William Henry Christian, Pittsburgh; Leonard Medical School, Raligh, N. C., 1905; member of the Medical Society of the State of Pennsylvania; aged 61; died September 23, of aortic stenosis.

Joseph B. Cowen, Hamilton, Ohio; Medical College of Ohio, Cincinnati, 1897; aged 63; on the staffs of the Fort Hamilton Hospital and Mercy Hospital, where he died, October 2.

William M. Wilson @ Weaverville, Calif.; College of Medical Evangelists, Los Angeles, 1931; aged 40; died, September 10, of chronic nephritis, hypertension and cerebral hemorrhage.

Guy Ross Caley, Princeton, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1900; aged 63; died, September 26, of heart disease and chronic nephritis.

John William Adams, Waterville, Wash.; Jefferson Medical College of Philadelphia, 1887; formerly county health officer; aged 78; died, October 10, in a hospital at Wenatchee.

William Lamar Law, Prattville, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1894; aged 68; died, October 13, in a hospital at Atlanta, Ga., of myocarditis.

John William Greer, Franklin, Tenn.; Memphis Hospital Medical College, 1899; member of the Tennessee State Medical Association; aged 69; died, October 16, of coronary thrombosis.

Ira A. Griffin, Snyder, Texas; Memphis (Tenn.) Hospital Medical College, 1908; member of the State Medical Association of Texas; aged 55; died, October 2, of cirrhosis of the liver.

Charles A. Haefner, Youngstown, Ohio; Central College of Physicians and Surgeons, Indianapolis, 1905; aged 64; died, October 10, in St. Elizabeth's Hospital of diabetes mellitus.

William D. Wilkinson, Boston; Middlesex College of Medicine and Surgery, Waltham, Mass., 1928; aged 40; was found dead, September 23, of a self-inflicted bullet wound.

Frederick Rutherford Warnock, Pembroke, Mass.; Columbia University College of Physicians and Surgeons, New York, 1937; aged 28; died, September 12, of appendicitis.

Carlyle Junius Edwards, Raleigh, N. C.; Medical College of Virginia, Richmond, 1917; member of the Medical Society of the State of North Carolina; aged 50; died, September 30.

Edwin Justus Haster, Dardanelle, Ark.; Kansas City (Mo.) College of Medicine and Surgery, 1924; member of the Arkansas Medical Society; aged 39; died, September 24.

Charles Gowen Buchanan Klophe, Ontario, Calif.; College of Physicians and Surgeons of Chicago, 1887; aged 72; died, September 17, of heart disease and arteriosclerosis.

William E. Jenkins, Charleston, Miss.; Louisville (Ky.) Medical College, 1887; at one time mayor of Eupora; formerly county health officer; aged 73; died, September 28.

Daniel E. Richards, San Diego, Calif.; Western Pennsylvania Medical College, Pittsburgh, 1894; aged 81; died, September 4, of arteriosclerosis and coronary occlusion.

Mark Johnson Williams, Oxford, Ala.; Birmingham Medical College, 1902; member of the Medical Association of the State of Alabama; aged 61; died, September 23.

Eugene Wolcott Whitney, La Mesa, Calif.; Rush Medical College, Chicago, 1878; past president of the Utah State Medical Association; aged 85; died, September 26.

Edward Gardner De Wolf, Somerville, Mass.; Dartmouth Medical School, Hanover, N. H., 1893; aged 70; died, September 29, in Worcester of bronchopneumonia.

John Albert Wilson @ New York; Columbia University College of Physicians and Surgeons, New York, 1917; aged 52; died, September 5, in Nantucket, Mass.

Harold Kirby, Minneapolis; University of the City of New York Medical Department, 1891; aged 71; died, September 23, in Louis Park, Minn., of sarcoma.

Rasmus Hansen Madsen, Palo Alto, Calif.; University of California Medical Department, San Francisco, 1901; died, September 22, in the Palo Alto Hospital.

Harvey Jason Hassard, Portage la Prairie, Man., Canada; Trinity Medical College, Toronto, Ont., 1901; aged 61; died, September 29, of coronary occlusion.

Willis J. Evans, Denver; Long Island College Hospital, Brooklyn, 1905; veteran of the Spanish-American War; aged 65; died, October 3, of myocarditis.

James Edward Childs, San Diego, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; aged 78; died, September 5.

Frank L. Harold, Richmond Ind.; Physio-Medical College of Indiana, Indianapolis, 1903; aged 60; died, October 14, of acute nephritis and enterocolitis.

Daniel Alfred Stubbs, Oxford, Pa.; Jefferson Medical College of Philadelphia, 1874; aged 87; died, September 25, in West Chester of pneumonia.

Frank Dudley McCulloch, Moose Jaw, Sask., Canada; McGill University Faculty of Medicine, Montreal, Que., 1925; aged 40; died, September 8.

Ernest Maxwell Fine, Crescent City, Calif.; Cooper Medical College, San Francisco, 1898; aged 66; died, September 30, of cerebral hemorrhage.

Bureau of Investigation

BUREAU OF INVESTIGATION

2077

A. E. G. HALL Alfred Ernest George Hall Again Reenters the United States and Becomes "Acquainted" with Another Better Business Bureau

A. E. G. Hall has twice previously been discussed in the columns of the Bureau of Investigation in THE JOURNAL. Both his penitentiary pictures and his fingerprints have been reproduced in our pages. The article which appeared in the issue of Oct. 13, 1928, called attention to the fact that Hall had encountered difficulty with the Rochester (N. Y.) Better Business Bureau and, after a heart-to-heart talk with Mr. F. M. Willson, the manager, canceled his remaining lectures and left the city.

The *Spotlight*, a publication of the Better Business Bureau of San Francisco, carried in its September 1939 issue a story under the heading "Dr. Alfred G. Hall, Famous Swindler, Nabbed in Marin County." This item reads as follows:

"Dr. Alfred G. Hall, international swindler, pseudo-religious lecturer and promoter of the World Fellowship of Faith and Service, was apprehended in San Rafael on August 19 by Police Chief John B. Ruschetti, charged with illegal entry into the United States. The Better Business Bureau's tip to immigration authorities caused Hall's arrest. 'Plans for a \$100,000 university to be erected in Marin County were under way at the time Hall was nabbed. One follower presented the organization with a fifteen-acre site for the university. Others were urged to contribute finances for the enterprise. Hall officiated at a dedication ceremony a short time ago. Chief Ruschetti became suspicious when he observed Hall living with his followers in tents on the proposed site for the university.'

"Inquiries from persons who listened to 'Dr.' Hall's lectures at Western Women's Club, San Francisco, caused the Better Business Bureau to check his antecedents. It developed that he has a long record of promotions. At one time he was a self-appointed prison chaplain, but a few weeks later was lodged in the same jail where he had urged others to 'follow the straight and narrow path.'

"An eventful career, marked by numerous arrests, was indicated by reports received from Better Business Bureaus throughout the United States and Canada. While he uses the title of 'Dr.', it has not been substantiated that he has such a degree. In discourses on 'Sex and Civilization', he claimed to be a specialist from London, Paris, Geneva and Vienna. In Toronto, a newspaper described his sex lectures as 'utterly filthy and unscientific discourses on sexual subjects.'

"At Richmond, Indiana, he created the 'American Academy of Psychological Research', modestly styled himself the 'Dean', and distributed degrees lavishly, the Bureau learned. In 1926, he created an organization to lecture against the use of narcotics, voting himself a satisfactory salary for his lectures. In Chicago, he operated a confidence game which brought him a sentence of six months in the House of Correction.

"One of Hall's lectures in San Francisco was on the subject of 'Wandering or Going Straight.' Evidently he preferred, in his personal matters, to wander."

For purposes of reference, Hall's record, as far as the Bureau of Investigation had it at the time of an article published in THE JOURNAL, May 18, 1935, was as follows:

- 1923—Vancouver; arrested for obtaining credit under false pretenses. Sentence suspended.
- 1924—Vancouver; arrested for conspiring to defraud. Case dismissed. Again arrested, charged with obtaining money under false pretenses and sentenced to six months at hard labor in Oakalla Prison.
- 1925—Vancouver; arrested for obtaining money under false pretenses. Sentenced to twelve days. Again arrested for obtaining money under false pretenses and sent to jail.
- 1926—Chicago; arrested on charge of operating a confidence game and obtaining money under false pretenses. Was fined and sentenced to six months in the House of Correction.
- 1927—Chicago; arrested for practicing medicine without a license. Charge nolle prossed for lack of prosecution. At the same time Hall was taken into custody by the United States authorities as an alien who had violated the Immigration Act. He was given hearing and deported.
- 1928—Toronto; arrested on the charge of vagrancy. Charge withdrawn, as he had money in his pocket.
- 1930—Toronto; arrested for swindling the Royal York Hotel of about \$1,100. Sentenced to six months in the Ontario Reformatory.
- 1932—Cleveland; arrested by the police department and again deported to Canada.
- 1933—Toronto; arrested and found guilty of theft. Sentenced to two years in the Kingston Penitentiary.

The 1935 article detailed his escapade in Toronto in 1930, in which he ran a bill of \$220 at the King Edward Hotel

and, according to the Toronto papers, Hall persuaded the Royal York Hotel to put on a \$1,000 banquet in connection with which he was later charged with obtaining credit by false pretenses. He had introduced himself as a doctor and general organizer of the National Order of Canada, which he claimed was paying him \$12,000 a year and expenses. As a matter of fact, the Order had seventy-five members at that time, but Hall was not receiving any salary from it. He was convicted and sentenced to six months determinate and six months indeterminate in the Ontario Reformatory in May 1930. Said THE JOURNAL in 1935:

"Not content with this sample of Ontario justice, Hall in 1933 was put on trial in Toronto on a charge of theft. Hall and one Fred Hastings, with whom he was associated, were alleged to have stolen \$2,482 paid to them as subscriptions for various magazines and periodicals while they operated an organization known as the Dominion Publications Bureau. Hall acted as his own attorney, and in addressing the jury he said: 'You have not before you the ordinary type of criminal that goes out to plunder and steal.' He pleaded 'justification and honest error.' Hall told the jury, also, that he had written books about criminals, had looked after them spiritually, had studied them psychologically, and their actions were not the same as his own. He again charged that he was being hounded by the authorities. Hall was very persuasive and dragged the usual red-herrings across the trail, and the judge, in charging the jury, warned them not to allow themselves to be carried away by frenzied eloquence.' They did not. Hall was sentenced to two years in the Kingston Penitentiary.

"A few weeks ago Hall completed his two-year sentence in the penitentiary. Apparently no sooner was he out of the penitentiary than he hired a hall, in accordance with his usual methods, and, as the Toronto *Evening Telegram* reported, 'smartly dressed in striped trousers, black coat, wing collar and flowing tie', addressed an audience of less than a hundred—telling them what an unpleasant place the Kingston Penitentiary is. He also made charges against the warden of the penitentiary and the Hon. D. M. Ormond, Superintendent of Penitentiaries at Ottawa. Hall is reported to have stated to his audience that he didn't regret his experience in the penitentiary and that since getting out he had written a 100-page report. He claims to have been one of those sentenced to be paddled while he was in the penitentiary, but it appears from the report that, unfortunately for the public—and possibly for Hall himself—the sentence was not carried out."

This article concluded as follows: "The reason for calling attention to A. E. G. Hall is that this quack and ex-convict is more than likely to make another attempt to get into the United States. If he does, it can be taken for granted from his past record that he will live by his wits and at the expense of the American public."

Sooner or later Hall may catch on to the idea that he is not wanted in this country. Various protective organizations are doing their utmost to prevent his nefarious activities. Past experience, however, leads to the belief that he will spend the rest of his life playing true to form the role of psychological quack that he has selected for himself.

MISBRANDED "PATENT MEDICINES" Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Correcol.—Modern Health Products, Inc., Milwaukee. Composition: Essentially Lallemandia royleana (a mucilaginous substance) and a smaller amount of karaya gum. Fraudulently represented to be a health product and to correct colonic disorders.—[N. J. 29765; March 1939.]

Life (Miracle) Mineral Water.—Rocky Mountain Mineral Co., and George A. Manning (agent), Bessemer, Ala. Composition: Chiefly iron sulfate with small amounts of other mineral substances, not named. Fraudulently represented as a remedy for stomach troubles, arthritis, old sores, female complaints, blood diseases, etc.—[N. J. 29753; March 1939.]

Slim.—Modern Health Products, Inc., Milwaukee. Composition: Essentially senna (70 per cent), orange peel, anise, bladderwrack, buckthorn bark, dried apple, and centaury flowers. Fraudulently represented to normalize overweight, make the body slim and act as a health product.—[N. J. 29765; March 1939.]

Correspondence

THE PSYCHOLOGY OF THE BIRTH CONTROL CONTROVERSY

To the Editor:—In THE JOURNAL October 21 appears an article by Dr. George Kosmak with regard to birth control.

Dr. Kosmak refers to the "hysteria" of some one or other connected with the birth control movement; he refers to an "insane" approach and the "agitation" of many people. He refers to "loose thinking" and again to their "hysteria," to their "viciousness" and to their "inadequate reasoning."

Dr. Kosmak uses these psychiatric designations as if to contrast his own mental poise with the mental ill health of those with whom he doesn't agree. I am well acquainted with the persons who are chiefly responsible for having brought the problem of birth control to the more serious attention of our profession and of the public generally, and in my capacity as a psychiatrist I must offer the opinion that no signs of hysteria, insanity, viciousness or agitation have made their appearance. On the contrary, I should say that far more quiet, intelligent reflection and far less emotion have been manifested by them than by Dr. Kosmak in his somewhat excited diatribe against them.

Dr. Kosmak is entirely correct in saying that the question deserves scientific study, and this is precisely what the non-professional advocates of birth control have sought. There is nothing to prevent Dr. Kosmak's doing this without denouncing those earnest and honest individuals, all of them friends of the medical profession, who have brought this problem out of the realm of prudish and bigoted suppression to the point where the scientific intelligence of Dr. Kosmak and others can be applied to its solution.

KARL MENNINGER, M.D., Topeka, Kan.

[Dr. Menninger's letter was submitted to Dr. Kosmak, who replied as follows:]

To the Editor:—I had fully expected reactions to my paper such as those enunciated by Dr. Menninger. Notwithstanding his doubts about my designation of certain groups of "birth control" enthusiasts as hysterical and given to exaggeration and loose thinking, I feel that my judgment of their activities will be generally endorsed by many fair minded members of the profession as well as by laymen who can trace the connection between their propaganda and the widespread results of the desire for avoiding pregnancy under all circumstances. In this connection one might also refer to the disgusting commercial exploitation of contraceptive devices which is encountered on every hand and which may be regarded as a response to the public dissemination of the literature and utterances of propagandist groups. One cannot question the sincerity of the rational advocates of birth control for medical and, perhaps, limited social indications, but my particular condemnation applies to the more radical groups who have fathered the extensive newspaper, magazine and other publicity with which a perfectly legitimate movement has been surrounded and which has worked to its detriment. The terms which I employed in my paper to designate those activities would be applicable in common parlance, although they may not agree with the more scientific (?) diagnostic designations of the psychiatrist. In view of the many commendatory letters received, my views evidently met the approval of those less hampered by such academic distinctions.

As for any expressions of friendliness toward the medical profession from certain advocates of the unrestrained dissemina-

tion of birth control information as claimed by Dr. Menninger, this has been developed, in my opinion, largely as a matter of expediency only in more recent years.

A careful reading of my paper would have disclosed to Dr. Menninger that I made no accusations whatever against those earnest and sincere persons who have approached the problem as a health or social measure in a purely professional sense. But these are not the people to whom I refer, and one need not seek very far to learn the identity of the others.

Physicians as a class must be accused of indifference and laxity in their attitude toward the important questions involved in the subject of what is popularly but erroneously designated as "birth control." If they can be stimulated to assume their responsibilities in the matter, this would prove a satisfactory ending to the discussion and constitute a sufficient reason for the attention which my own small effort may have generated.

GEORGE W. KOSMAK, M.D., New York.

REDUCTION OF MOTOR ACCIDENTS

To the Editor:—The most serious medical problem in the United States today is the motor accident. A special committee should study this problem from all angles, such as (1) road construction, (2) proper universal marking of roads, (3) car construction, (4) education of the public, and (5) proper medical care.

As coroner of a small county of 80,000 population, I have tried to reason "the why of accidents" in this locality. Contrary to most people's belief, alcohol and too fast driving are not the chief causes. The usual cause is lack of proper judgment on the part of the driver. Judgment depends on the condition of the driver, the condition of the road, road markings, construction of the car, the weather and an estimate of the speed of an approaching car.

In the fatal accidents of this county I have noted the part of the car that I thought responsible for the accident. If all coroners would report such observations to an American Medical Association committee, I believe that, through recommendations, the automobile death toll in the future might be reduced in place of gradually rising higher and higher.

The following suggestions are based on my personal study of accidents resulting in death in Linn County, Iowa, during the past four years.

Compulsory Driver's Test After an Accident.—The driver in an accident case should be compelled to take a driver's test. The committee might advise all states to frame a law making it compulsory for any driver involved in an accident to take another driver's test before driving a car again. Those failing to pass should be refused a new license until the defect in the car is corrected or the driver's abnormality is properly remedied.

Road Markings.—Knowing that many drivers have defective vision—not properly corrected—and that persons with good vision often cannot read letters of 6 inches through dirty windshields off the side of the road when traveling in a car at 40 miles an hour, I suggest that the signs for traffic safety should be on the pavement, directly in the lane of best vision. No fatal accident, which any sign could prevent, happens when snow covers the pavement, the only objection to "on pavement" signs.

Safer Car Construction.—Desiring more safety for myself and family I shall herewith order the first 1941 popular priced car (any make) constructed according to the following safety ideas.

1. Bumper All Around: A bumper running entirely around the car (removable section to change tires). In most fatal

accidents the bumper of one car catches into the front or rear wheels of the other car and both turn over, or the end of the front bumper is pushed into the front wheel and the car darts off the road.

2. Turtle or Helmet-Shaped Body: Artists have streamlined the tops of cars, but the bottom still has protruding fenders and door handles. The body should be brought out to the bumper on the sides at the bottom so that the fenders are entirely beneath the body. The running board—if any—should also be covered by the body of the car. Door handles should be hinged and dropped into a well in the door.

3. Knock Out Windshield: With safety glass in the windshield, the doctor now sees severe head and neck injuries. The windshield should be so designed that a force of 50 pounds from the inside would loosen the entire windshield without breaking it.

Other desirable features are the steering wheel constructed of material that will bend but not break. There should be no sharp corners on the instrument panel. A strong support should be placed behind the engine to keep the engine from being pushed back against the front seat in case of collision. There should be no sharp ornaments near the front of the car.

B. L. KNIGHT, M.D., Cedar Rapids, Iowa.

Coroner of Linn County.

THE ERYTHROCYTE SEDIMENTATION TEST

To the Editor:—In a recent issue of THE JOURNAL (September 2, p. 942) appeared an editorial on the technic of the erythrocyte sedimentation test. In this editorial an article by Hambleton and Christianson (*Am. J. M. Sc.* 198:177 [Aug.] 1939) was cited in which the authors concluded that the "most commonly used sedimentation technic, without involving complicated corrective procedures, is the most valuable for clinical purposes." The editorial closes with the remark that "this furnishes welcome news to the vast majority of those using the blood sedimentation test in their office and hospital work."

Of course, any report which purports to simplify the technic of a laboratory procedure to such an extent that the general practitioner can carry out the test in his office is welcome news to him and also to the technicians who must do the test. Unfortunately, in most cases the so-called simplification entails the omission of vital steps in the procedure, and this seriously detracts from the reliability of the results. In the case of the apparently simple sedimentation test there are many factors which must be taken into account if results worth the effort are to be obtained.

In an article on the sedimentation rate of erythrocytes, Ham and Curtis (*Medicine* 17:447 [Dec.] 1938) have indicated some of the technical factors responsible for variations in the results obtained in tests made on a single specimen of blood, based on a review of the literature and careful experiments carried out by themselves. The following are some of the points in the technic which affect the sedimentation rate: 1. The rate has been found to be more rapid at higher temperatures. 2. If the tube is inclined away from the vertical, the rate is considerably increased. 3. Other things being equal, the sedimentation rate is higher for lower concentrations of the erythrocytes.

For an understanding of the significance of the results of sedimentation tests, it is essential to know on what properties of the blood the rate of sedimentation depends. It is obvious that the greater the difference in specific gravity between the red cells and the plasma, the more rapidly will the cells settle.

On the other hand the higher the viscosity of the plasma, the more delayed will be the sedimentation of the cells. Finally, since the larger the size of the particles settling in a medium the more rapidly does sedimentation occur, if the red cells are clumped in rouleaux the rate will be increased.

It is evident that an increased sedimentation rate need not in every case signify the presence of an infection or a proteolytic process, nor does the rate depend on a single specific substance in the blood, although it has been shown that a definite correlation exists between the rate and the fibrinogen content of the plasma. For example, the ingestion of large amounts of water would decrease the specific gravity of the plasma and also its viscosity, and in that way might give rise to an increased sedimentation rate. In this connection a report by Ride, Ling, Lim and Cheng (*Caducues* 17:175 [Nov.] 1938) on the sedimentation rate in cholera is of interest. These authors observed that during the acute stage of the disease, on account of the large loss of water through the bowels, the viscosity of the blood is so greatly increased that the sedimentation rate is considerably reduced. When the patient begins to recover, the normal viscosity of the blood is restored and the rate is increased. Therefore in this disease one has the reverse of the usual state of affairs: the rate increases instead of decreasing as the patient improves.

With regard to the technical aspects, it is essential that care be taken to place the sedimentation tube in a perfectly vertical position and that all tests be carried out at the same temperature. With regard to the importance of the latter precaution I shall cite some unpublished experiments carried out with Barbara Fisk and Claire Edelman. Tests were made on a series of healthy blood donors by the technic of Wintrobe and Landsberg. The tests were set up in duplicate, one set at room temperature (in our experiments this varied between 68 and 73 F.) and the other at body temperature (98 F.). It was found that in practically every case the rate at body temperature was about two and one-half times as high as the rate at room temperature. For example, when the rate at room temperature was 2 mm./hour, the rate at body temperature was 5 mm./hour, and in another case in which the rate at room temperature was 16 mm./hour the rate at body temperature was 37 mm./hour. On the other hand, in the refrigerator the rate is considerably less than at room temperature. While under ordinary conditions room temperature should not vary greatly, on hot summer days or in warm climates it is necessary to make allowance for the effect of temperature on the test.

With respect to the importance of the erythrocyte concentration, Ham and Curtis point out that the red blood cells in settling displace the plasma, causing a current in an upward direction, and this in turn retards the sedimentation of the cells. The higher the concentration of red cells the more pronounced is this reverse current. To illustrate this I shall describe one of a series of experiments carried out by me with Fisk and Edelman. A blood with a hematocrit of 0.50, having a sedimentation rate at room temperature of 4 mm./hour, was centrifuged and the plasma and cells were separated. Then only enough cells were resuspended in the patient's plasma to give a hematocrit of 0.32. The sedimentation rate under these conditions was 34 mm./hour. In anemias the concentration of red blood cells is low, and, since in addition in severe anemias the viscosity of the plasma is usually decreased, there would be two factors militating to increase the sedimentation rate even in the absence of any additional pathologic condition. Therefore, if no correction is made for erythrocyte concentration, the results of the sedimentation test are apt to be misinterpreted.

A. S. WIENER, M.D., Brooklyn.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LATENT SYPHILIS—HEMATURIA IN SYPHILITIC PATIENT

To the Editor:—A man with syphilis still has a 4 plus reaction to Kahn, Kline and Wassermann tests after a year's regular treatment. For the past five months there has been a hematuria with from 2 to 30 cells per high power field. He is a railroad worker, aged 35, of excellent general appearance, a weight of 186 pounds (84 Kg.) and a height of 5 feet and 10 inches (178 cm.). There is no history at the time of the original infection. He has no children, and his wife has had three negative Wassermann reactions and three physical examinations with negative results since he has been under treatment. Wassermann, Kahn and Kline reactions were 4 plus on Oct. 27, 1938, at which time his only complaint was "canker sores" in his mouth. No dark field examination was made. He received a half dose, 0.3 Gm., of nearsphenamine (first dose) intravenously, followed by 0.3 Gm. and 0.45 Gm. of nearsphenamine in weekly injections for a total of eighteen doses. During the same period he has received 0.2 Gm. of bismuth subsalicylate once a week for a total of seventeen doses. Since then he has received a weekly injection of nearsphenamine or bismuth (five of nearsphenamine and then five of bismuth) since the hematuria was discovered. To date he has had a total of thirty-two nearsphenamine and thirty-four bismuth injections in eleven months of treatment. At about the time of the fifth nearsphenamine injection he became violently ill several hours after his treatment, with chills, vomiting and headache. Previously he had had no reaction whatever except that one injection of nearsphenamine had been accompanied by local irritation. The three violent reactions did not occur chronologically. Sterilization of instruments, qualities of supplies and dietary control, before and after the nearsphenamine had been given, were carefully checked, and I felt were not the cause of his reactions. About February, after he had received fifteen nearsphenamine injections, there appeared a small series of painless moist ulcers about the size of a match head at the circumscribed edge of the penis. These disappeared with the use of a dusting powder made with a mercury base. No dark field study was made. There has been no recurrence of any lesions of the mucous membrane. There has been not even a mild reaction with the rest of his intravenous therapy. He has gained about 30 pounds (14 Kg.), looks well and has never felt better in his life. Blood pressure has been and is normal (125 systolic and 75 diastolic). A flat roentgenogram of his abdomen shows no stones of the kidney, ureter or bladder. Hematuria was first observed after about twenty-five nearsphenamine and bismuth injections. At that time he had a bilateral backache in the kidney region. He had from 10 to 20 pus cells in the first specimen with a 3 plus reaction for blood. He gave a history of a recent head cold, accompanied by severe backache. I do not know whether this preceding respiratory infection had any connection. At any rate he was cut down to one injection a week, in series of five. We were unable to discover any increase or decrease in hematuria following the bismuth or the nearsphenamine interval. I am unable to decide, because of the hematuria and the remaining 4 plus Wassermann reactions, what I can best do for him. I have not made a spinal fluid Wassermann test but planned to do so before discharging him. He understood from the start that he would probably need treatment for one to one and a half years. I should greatly appreciate counsel as to further treatment of this man. In a recent series of 500 Wassermann tests on employees of an industrial plant, I found among those with positive reactions about six with 4 plus Wassermann, Kahn and Kline reactions who had had previous treatment to the point of becoming Wassermann negative—some as long as twelve years ago. They were all symptom free on careful physical examination. I acknowledge the need for individualization, but what general program would you start with and how long would you treat them after their Wassermann reactions are negative again?

M.D., Indiana.

ANSWER.—This question resolves itself into three parts: first, the management of syphilis in the patient in question; second, the hematuria of the patient, and third, the general treatment of patients with latent syphilis who were seronegative as a result of previous treatment but are now seropositive.

1. No definite conclusions can be reached as to the stage of syphilis in the patient described. The supposed "canker sores" in the mouth in October 1938 and the penile lesions in February 1939 might conceivably have been early and treatment-resistant syphilis, though this cannot now be proved since no dark field examinations were made. On the other hand, it is much more likely that the "canker sores" represented an ordinary aphthous stomatitis and the penile lesions herpes progenitalis and that they are therefore of no value in dating the infection in the patient. The fact that the wife is normal suggests that the patient had syphilis at least five years before his marriage to her, the date of which is not given. His physical examination is not completely described, though the inquirer apparently assumes that the syphilitic infection is latent.

No opinion whatever can be expressed as to the adequacy of treatment given so far or as to the type of treatment still to be given until the patient's spinal fluid is examined. The inquirer states "I have not done a spinal fluid Wassermann test but planned to do so before discharging him." It cannot be too frequently emphasized that in the treatment of patients with late syphilis of any type—latent or otherwise—the spinal fluid should be examined early, not late, and if possible at the start of treatment. If the spinal fluid reaction is positive, treatment is usually of a different type and always of a different intensity than if the spinal fluid is normal. It goes without saying, moreover, that a spinal fluid Wassermann test is not adequate and that a proper examination of the spinal fluid includes cell count, quantitative protein estimation, quantitatively titrated Wassermann test with amounts ranging from 0.1 to 1.0 cc., and a colloidal test, gold, mastic or benzon.

It is immediately necessary therefore to test the spinal fluid. If this is normal and if the results of careful physical examination with particular reference to the central nervous system and cardiovascular apparatus, plus results of fluoroscopic and teleroentgenographic examination of the cardiovascular stripe (the latter including the left anterior oblique position) are normal, it may be assumed that the patient has now had enough treatment for syphilis and this may be stopped, regardless of his positive serologic reactions. If, on the other hand, the spinal fluid is abnormal or if physical and x-ray examination show abnormalities in the nervous system or cardiovascular system, further treatment is indicated, but its type and amount cannot be determined without more information than is supplied.

2. Much more important at the moment than the patient's syphilitic infection is the hematuria, the cause of which is by no means clear on the basis of the information provided. It may be safely assumed that this is not due to syphilis and that it is almost surely not due to antisyphilitic treatment. The head cold accompanied by backache immediately preceding the discovery of hematuria suggests that the latter may be due to an acute glomerular nephritis or an acute or subacute pyelonephritis. The investigation of the hematuria is, however, hardly complete with a flat plate of the abdomen only. Is there any edema? What are the results of renal function tests? Does intravenous pyelographic study show any abnormalities? If no other cause for the bleeding can be discovered cystoscopic and retrograde pyelographic examination should be carried out in order to determine its cause.

The importance of definition of the cause of the hematuria is so great as to suggest that temporarily, and regardless of the outcome of spinal fluid examination, treatment for syphilis should be suspended until the complicating disease is more accurately defined.

3. The third question deals with the general problem of the management of patients with latent syphilis treated to the point of seronegativity but later, after years of subsequent observation, showing positive serologic reactions of the blood. The question is based on the prevalent custom of treating patients with latent and late syphilis on the basis of serologic data. The successful treatment of latent syphilis at the time of the original diagnosis does not depend on reversal of the serologic reaction to negative but depends instead on the administration of an arbitrary amount of treatment determined by the clinical outcome in large series of patients followed over long periods. One needs closely to keep in mind the purpose of treatment of latent syphilis, which is not the treatment of a blood reaction but instead treatment administered prophylactically to prevent the development of disease as opposed to laboratory evidence of infection. On the basis of present knowledge, eighteen months of continuous antisyphilitic treatment is adequate for the patient whose syphilis of more than four years' duration is genuinely latent. Whether or not treatment should be terminated at this point or carried further has nothing whatever to do with the outcome of the blood test. Whether or not it should be subsequently resumed depends not on the outcome of the qualitative serologic test per se, but instead, and this is much more important, on the basis of the possible development of clinical evidence of disease or on a high titer serologic relapse as evidenced by repeated quantitative blood tests.

In the particular circumstance described here a patient treated twelve years ago then became seronegative and is now found to be seropositive. This circumstance almost surely depends not on any change in the patient himself but instead on increased sensitivity of the serologic tests employed now as contrasted to those employed twelve years ago. The question then becomes: Shall one resume treatment on this patient because laboratories now are better than they were twelve years ago? This question answers itself by virtue of its own absurdity.

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In other words, if the six patients mentioned in the inquirer's last paragraph were adequately treated for latent syphilis some years ago; if they now show no physical evidence of disease, and if results of their spinal fluid examinations are all normal, it may be inadvisable to give any treatment. It is, however, advisable to continue to perform blood tests at periodic intervals by a quantitative technic. If the reagin titer in the blood of these patients is rising, the desirability for treatment may again become apparent.

Parentetically, this is the only present known use for quantitative titration of serologic tests, namely, for the follow-up study of patients who have been placed on probation.

INFLUENZA IN HORSES AND MAN

To the Editor:—A man states that he bought a horse which had influenza (or shipping fever) and that he contracted influenza from this horse. Will you kindly let me know whether the "flu" is communicable from horse to man? If there is any literature regarding this subject I would appreciate it if you would refer me to it.

S. H. Anderson, M.D., Red Wing, Minn.

ANSWER.—The impression that equine influenza is related to influenza in man is old. Numerous writers have called attention to the synchronous relationship of influenza in horses and epidemics of influenza in the human population. According to A. J. Williams (Analogies Between Influenza of Horses and Influenza of Man, *Proc. Roy. Soc. Med.* 17:47 [June] 1924) there has been no convincing evidence that the equine disease is transmitted to handlers, and in the equine epidemic of 1872-1873 there was no increased amount of influenza in man. Equine influenza has not been thoroughly placed on an etiologic basis, although hemolytic streptococci have been found in abundance in most outbreaks. Waldmann has studied the epidemic cough of horses which resembles what is called equine influenza and has reported the isolation of a filtrable virus which combines with hemolytic streptococci to produce a severe form of the disease. There is no evidence that this virus bears any relation to human influenza virus.

It would appear that much of the answer to this question depends on whether the correctness of the diagnosis of horse influenza is important. Other equine diseases, such as encephalomyelitis, do attack human individuals.

POSSIBLE TULAREMIA AFTER CATFISH PRICK

To the Editor:—On May 31, 1939, a 16 year old boy came to my office with the complaint "I was stuck by a catfish yesterday and today I feel terrible and my arm hurts." Further questioning revealed that it was the ordinary type of catfish and that the patient was having sharp shooting pains through the right arm and shoulder. He had been feeling well prior to the accident. The past and family histories were essentially irrelevant. The temperature was 101 F., the pulse rate 100 and the respiratory rate 22. There was an area of redness about the size of a half dollar over the right costoclavicular junction. The axillary glands were palpable or tender. He was given symptomatic treatment, i. e., powder of ipecac and opium to induce diaphoresis, forced fluids, bed rest, and hot packs to the site of puncture. On July 10 he received a dirty puncture wound on the sole of the left foot and was given 1,500 units of antitetanus serum in the left deltoid. At this time he was still returned because of difficulty in using the right shoulder. On August 23 he had a small foreign body discovered over the right arm, particularly in the junction was extracted and found to be a sharp bony spine about one-fourth inch long. He was referred to an orthopedist and on September 13 I received the following report: "The right shoulder shows moderate atrophy of the supraspinatus and infraspinatus muscles. There is marked weakness of the serratus magnus with winging of the scapula. The right shoulder is lower than the left. The deltoid, biceps and pectorals are not involved." I should appreciate having the following questions answered: Is any catfish toxin known which might have produced this virus on being "horned" by a catfish? Could the antitetanus serum possibly have had any such effect? (The skin test was negative and he had mild serum reaction about a week later for which he did not report back.) What treatment would you recommend?

M.D., Ohio.

ANSWER.—Catfish in certain sections of the country have become contaminated with *Bacterium tularensis*. One specific case of human infection from the prick of a catfish fin has been reported by D. H. Miller in Wichita, Kan. In this case the fish was caught in the Neosho River, Morris County, Kan. Miller learned that at least three other persons, after being pricked by fins of fish of the same catch, developed a disease similar to that of his patient, which was proved to be tularemia. He was further able to obtain reports that rabbits with so-called rabbit fever had been seen to fall into the river and drown and that the river water contained numerous rabbit carcasses.

Although in the case reported in this query there was an extremely short incubation period, since the patient stated that the injury from the catfish occurred on the day preceding his

application for medical attention, the temperature, pulse and area of redness in the region of the shoulder are quite compatible with a *Bacterium tularensis* ascending infection from the catfish injury. Infection which may have localized in the right costoclavicular junction may well have resulted in considerable atrophy from disuse of the shoulder.

No evidence has been found which would justify any assumption that there is a catfish toxin. It is equally unlikely that the antitetanus serum produced the disability. The course of the illness, as described, is not compatible with a diagnosis of anterior poliomyelitis and there have been no cases reported in which the inoculation with poliomyelitis virus occurred in any manner similar to this. It would be well to have a serum agglutination test for tularemia, since this test continues positive for a long time after the infection itself has subsided. If tularemia cannot be proved and the diagnosis of paresis of the serratus magnus with winging of the scapula is correct, this arm should be splinted in a position of 90 degrees abduction at the shoulder and 45 degrees external rotation. This airplane type of splint should be continued for not less than three months, with the patient receiving physical therapy consisting of light, heat and light massage two or three times a week, if this type of treatment is available. Exercises for the weak muscles should be carefully supervised and should not be started until from four to six weeks after applying the splint.

SLOW FETAL HEART RATE

To the Editor:—What explanation would you give for a slow heart in this case? The rate at fetal heart tones at every examination was 76 a minute with an occasional dropped beat. The tones were loud. One hour after birth the tones were regular and of good quality and the rate was 78; since then it has been 80. Once during sleep it was 66 a minute. The baby is developing normally and is breast fed. Physical examination does not reveal anything wrong with the heart as to size or murmurs. The mother's heart rate during pregnancy and now is 78 to 80. She had an attack of cardiac angina at the seventh month that required morphine, and there is a history of an attack one year ago. Can you have an opinion on such limited information? Has any case of such a low pulse in a fetus or newborn infant been reported?

W. I. Devers, M.D., Pierce, Neb.

ANSWER.—A fetal heart rate of 80 or less is rare late in pregnancy. It is quite common to find a temporary slowing of the heart beat as a result of some interference with the fetal circulation, but as a rule the rate returns to normal in a period of hours. To have such a condition persist after delivery of the baby is extremely rare. In a maternity service which has delivered well over 50,000 babies there is no accurate record of such a case. One must assume that there is some congenital anomaly involving the sino-aortic node similar to the condition which is responsible for heart block in the adult. Cardiac congenital abnormalities are not rare, although this particular abnormality is unusual. The baby should be studied carefully if possible by means of the electrocardiograph. In the event that no unusual organic pathologic condition can be determined no therapy is indicated.

PHYSIOLOGY OF TICKLING

To the Editor:—Why is it that the vast majority of people are sensitive to tickling, especially in the axillae, when the tickling is done by a second party, yet are completely unaffected when they do it to themselves? Can the explanation be purely psychologic? What is the physiology of tickling of the skin and the common nervous effect?

M.D., Saskatchewan.

ANSWER.—Most people have what is known as a deep tickling reflex, which is brought about by peripheral stimuli not self induced and results in laughter. It is elicited by stimulation of the end organs of certain large tendons or aponeuroses, or of the periosteum of certain large bones, especially the ribs. The areas in which such pressure produces laughter are the lateral walls of the thorax, axillae, abdomen and iliac fossae. The pressure must be done usually by another individual and it induces a tonic contraction of the neighboring muscles together with a withdrawal from the stimulus and laughter. At times weeping may occur. The fact that laughter usually does not occur when the stimulation is self induced is due to two factors. One is that the individual is not prepared to laugh (conscious inhibition) and the other is that there is no decrease in the tone of the involved musculature that is being stimulated. Certainly laughter temporarily diminishes the tone of all the voluntary muscles. It is entirely possible to overcome the effects of the deep tickling reflex by keeping the involved areas completely rigid. The pathway of the deep tickling reflex is peripheral nerve, posterior horn, posterior column and ascending tracts to the thalamus. There is also a superficial or cutaneous tickling or itching effect. This effect is a cutaneous sensation elicited either by the individual himself or by an outsider. It is pro-

duced by touching with a feather, moving the hairs, and the like. This sensation may continue for some little time after the stimulus has ceased and it can be relieved by vigorous rubbing or scratching of the involved part.

BRAKE FLUID AND TIRE POWDER

To the Editor:—Have you any information as to the composition and possible irritant qualities on the skin of the modern brake fluid used in automobiles? I understand that contact is sometimes irritating. Also is the powder used on new tires irritating to some skins?

Stanley Crawford, M.D., Pittsburgh.

ANSWER.—The composition of brake fluids is secret with automobile manufacturers and varies with the different makes of automobiles. Many contain esters of fatty acids, tetrahydrofurfuryl alcohol and other constituents which might be expected to produce dermatitis in susceptible individuals.

The powder used on new tires is usually composed of talc or soapstone and should not be a chemical irritant to the skin. However, if the powder is not finely ground there may be some sharp crystals remaining in it which may penetrate the skin and cause dermatitis. Whiting, which consists principally of calcium carbonate and a slight amount of silica and the oxides of iron and aluminum, is used extensively as a filler for rubber products and may bloom out of the rubber in the form of a powder. This should not irritate the skin. However, irritant materials such as antioxidants and accelerators may also bloom out of the rubber, and these substances will cause dermatitis in sensitive individuals. A chemical analysis of the powder on the rubber is necessary to determine whether it is soapstone put on to prevent the rubber from sticking or whether it is a "bloom." For further information on rubber and blooms the inquirer is referred to Skin Hazards in American Industry (Public Health Bulletin 215, part 1, pp. 1-10).

MYXEDEMA AND COLD EXTREMITIES

To the Editor:—A 70 year old multipara passed the menopause at 45. At 50 she was treated for myxedema because of increasing weight and a generalized cold feeling. The basal metabolic rate was extremely low. She took thyroid and corpus luteum by mouth for twenty years with benefit. In December 1938 she developed intermittent attacks of cold feet and legs with numbness of some of her toes. No ischemia or cyanosis was present. Now she has periods of extreme coldness of one or the other lower extremity, alternating with a sensation of heat in the same places. There may be places as large as two hands in various parts of the body, usually in the extremities, which will be extremely cold. Even during the hottest nights she sleeps at times with her legs wrapped in blankets and with hot water bottles applied. Frequently her whole torso will sweat profusely when her extremities are cold. At times she is symptom free for short periods. Attacks of cold in the extremities may last ten days. Attacks of heat in the extremities usually are of less than one day's duration. Except for a metabolic rate of -27, the physical examination of this patient is essentially negative. The blood pressure is 130 systolic and 80 diastolic; the urine, temperature, and blood count, reflexes and tactile sense are normal except for intermittent numbness of the great and adjacent toes of both feet. There seems to be adequate peripheral circulation as expressed by normal pulsating dorsalis pedis arteries. Can you suggest a diagnosis or means of arriving at one? Can you suggest treatment?

M.D., Texas.

ANSWER.—A patient with myxedema can scarcely be considered to have adequate treatment with a basal metabolic rate of -27 per cent. The first step in solving the problem is to raise the metabolism gradually to normal by slowly increasing the dose of thyroid. A word of caution is necessary because the patient is 70 years old and, therefore, more likely to have disease of her coronary arteries than younger patients. The dose should not be increased more than $\frac{1}{2}$ grain (0.03 Gm. U. S. P. thyroid) at a time and increases should not be made more often than once in six weeks.

INTRAVENOUS PARALDEHYDE

To the Editor:—Have you any information on the intravenous administration of paraldehyde? A friend of mine is using it in 2 to 3 cc. doses and believes it to be safe and effective in acute alcoholic intoxication.

M.D., California.

ANSWER.—The intravenous injection of from 2 to 3 cc. of paraldehyde would be entirely safe from the standpoint of dosage: Nitzescu and Iacobovici (*Presse méd.* 42:331 [Feb. 28] 1934) reported the use of from 0.15 to 0.21 cc. paraldehyde per kilogram of body weight by intravenous injection for the production of general anesthesia, and this would amount to from 10 to 15 cc. for an adult of 70 Kg. The only question concerns flocculation of the blood and consequent flocculation shock. They employed a 6 to 8 per cent solution of paraldehyde in 5.66 per cent of dextrose, injected at the rate of from 15 to 20 cc. a minute. This solution gives a distinct opacity

if shaken with an equal volume of protein solution (egg white diluted with 10 parts of water). However, the opalescence is slight and would probably not give trouble if the injection was made slowly. Paraldehyde requires 8 parts of water for solution, and if undiluted paraldehyde is shaken with an equal volume of the protein solution there is immediate precipitation. It would seem therefore that there is risk of serious flocculation shock if undiluted paraldehyde is injected into a vein, even if this is done slowly. Rectal injection of equal volumes of paraldehyde and olive oil, or of a 10 per cent solution in physiologic solution of sodium chloride, gives prompt sedation and would seem preferable to the intravenous injection.

DISCHARGING BREASTS

To the Editor:—A woman aged 26 has late latent syphilis with intermittent therapy. She suddenly developed a thin greenish discharge, which exudes and can readily be expressed from her nipples. Her mammary glands have also become enlarged within the last few months. An increase of 14 pounds (6.4 Kg.) in weight since May is also apparent, as is a sluggishness of her activity. The basal metabolic rate has not been determined. There has been oligomenorrhea and irregularity of the menses for the past three months. Erythema has been noticed over the hypothermic eminences of the palmar aspect of the hands. Approximately one and one-half years ago I performed an oophorectomy (unilateral), salpingectomy (bilateral) and appendectomy on this patient. She made an uneventful recovery. I realize that the syphilitic infection should be cured for. The other symptoms point to an endocrine imbalance, probably on an ovarian basis. The remaining ovary has undoubtedly failed because of vascular insufficiency (development of adhesions) or cystic degeneration as a result of the past gonorrheal infection for which the pelvic operation was done. Do you agree that the greenish discharge is of endocrine origin? M.D., Illinois.

ANSWER.—The secretion from the breasts may have an endocrine basis, but a microscopic examination should be made to be certain that the secretion does not contain blood. It is assumed that physical examination of the breasts revealed no abnormalities. The patient should have at least one basal metabolic test. Because of the recent sudden gain in weight, the patient should be placed on a reducing diet and should be given a small amount of thyroid even if the basal metabolic rate is normal, but certainly if it is lower than normal. Likewise, thorough and persistent antisyphilitic therapy should be instituted. The remaining ovary may not function properly because its circulation was interfered with mechanically by the operation rather than by adhesions and the gonorrheal infection. A bimanual examination should be made to rule out a pelvic disturbance, which occasionally is associated with a discharge from the breasts.

ELECTRIC OPHTHALMIA

To the Editor:—What is the best treatment for the extremely painful irritation of the eye caused by exposure to the glare of an electric welding torch? I have seen a number of cases lately and was usually forced to use morphine injections when local application of epinephrine and phenacaine hydrochloride, ice pack and avoidance of light were not satisfactory.

F. C. Kotzenstein, M.D., Salem, Ill.

ANSWER.—The condition known as electric ophthalmia, snow blindness or Klieg eye consists of a superficial injury to the corneal epithelium by ultraviolet rays of less than 3,300 angstroms. The superficial nerve terminals of the cornea are exposed by the death and desiccation of superficial epithelium and consequently the pain will persist until the epithelium has regenerated. Complete tight bandaging of both eyes and the local use of anesthetics usually suffices to control the pain, but, as the writer says, the use of morphine is at times necessary. That procedure is not contraindicated.

TERMITE SPRAY AND ORTHODICHLOROBENZENE

To the Editor:—Can you give me any information as to what is used in the commercial spray for termites and also as to any effects reported on the eyes of those employed in its use.

S. M. Gotes, M.D., Monticello, Ark.

ANSWER.—Orthodichlorobenzene is probably the agent in question. In connection with its use in combating termites the following statement appears in "Injury to Buildings by Termites" (United States Department of Agriculture, leaflet 101, June 1936). "The cautions to be observed in the use of this chemical are not to let it come in contact with the face and hands, as it burns slightly, and it is distinctly painful if it gets into the eyes. In applying it to a closed space beneath the building, the operator should not remain too long subject to the fumes, and it is desirable to secure as good ventilation as possible while applying the chemical."

For further and more detailed information concerning this chemical, reference might be made to "Dermatitis from Orthodichlorobenzene" (Queries and Minor Notes, *THE JOURNAL*, September 9, p. 1053).

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, November 25, page 1985.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Part III. Chicago, Jan. 16-18. New York, January 15-17. Registration closes Dec. 9. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Written. Part I. Various places throughout the United States and Canada, March 28. Oral. Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If sufficient candidates are received before March 1, there will be on June 10-14. Sec., Dr. C. Guy Lane, Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Written. Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathological examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 8-11. Applications for admission to Group A, Part II examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Written. Various cities of the United States and Canada, March 2. (The only written examination in 1940.) Oral. New York, June 8-10. Formal applications must be received before Jan. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics, Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 18-19. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlanta, Ga., Dec. 9-11. Sec., Dr. Byrl R. Kirklm, 102-110 Second Avenue S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Michigan June Examination

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration, reports the written examination held at Ann Arbor and Detroit, June 13-14, 1939. The examination covered fourteen subjects and included 100 questions. An average of 75 per cent was required to pass. Two hundred and five candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939)	79.2*	
Yale University School of Medicine.....	(1937)	86.8	
Georgetown University School of Medicine.....	(1938)	83.5	
Emory University School of Medicine.....	(1938)	81*	
Loyola University School of Medicine.....	(1939)	76, 80.1	
Northwestern University Medical School.....	(1939)	80.8,	
81.7, 82.1* 83.4,* 83.5,† 85.1,* 85.2,* 86, 86.2			
Rush Medical College.....	(1938)	82.2,*	
82.5,* 85			
The School of Medicine of the Division of Biological Sciences	(1938)	84.6, 87.4*	
University of	(1938)	84.6,†	
(1939) 81,			
Harvard Medical School.....	(1938)	81.9,*	
83.4			
Wayne University College of Medicine.....	(1938)	78.5,*	
(1939) 78.2,* 81.4,* 81.4, 83,* 83, 84.5, (1939)† 77,			
78.4, 78.6, 79.6, 79.7, 80.3, 81, 81.3, 81.3, 81.3, 81.4,			
82, 82.1, 82.2, 82.2, 82.3, 82.6, 82.6, 82.7, 82.8,			
82.9, 83.1, 83.1, 83.2, 83.3, 83.4, 83.5, 83.5, 83.5, 83.7,			
83.9, 83.9, 83.9, 84, 84, 84.1, 84.2, 84.2, 84.3, 84.3,			
84.7, 85.2, 85.3, 85.6, 85.7, 85.9, 86, 86.2, 86.8, 86.9,			
87, 87.3, 87.5, 88.5			
University of Michigan Medical School... (1938) 84.6,* (1939)		83.4,	
(1939)* 78.6, 78.6, 79, 79.6, 79.8, 79.8, 80.2, 80.9,			
81, 81.1, 81.1, 81.2, 81.3, 81.4, 81.4, 81.5, 81.6, 81.7,			
81.7, 81.8, 81.8, 82, 82.1, 82.1, 82.2, 82.2, 82.2, 82.3,			
82.5, 82.5, 82.7, 83.4, 83.4, 83.4, 83.5, 83.6, 83.7, 84,			
84, 84.1, 84.1, 84.2, 84.2, 84.3, 84.3, 84.3, 84.4, 84.4,			
84.5, 84.6, 84.6, 84.7, 84.7, 84.7, 84.7, 84.7, 84.7,			
84.8, 84.8, 84.9, 84.9, 85, 85, 85, 85.2, 85.2, 85.3,			
85.4, 85.5, 85.5, 85.5, 85.6, 85.6, 85.6, 85.6, 85.7, 85.8,			
86, 86, 86.1, 86.1, 86.3, 86.6, 86.7, 86.8, 86.9, 87, 87,			
87.2, 87.3, 87.7, 88.1, 89.5			
University of Minnesota Medical School..... (1938)		81,*	
(1939) 78.9,* 85,* 85.6, 88.2*			

St. Louis University School of Medicine.....	(1938)	82.5*
University of Nebraska College of Medicine.....	(1938)	90.8
Cornell University Medical College.....	(1938)	82.7*
Temple University School of Medicine.....	(1938)	85.7
University of Pittsburgh School of Medicine.....	(1938)	83.1
Meharry Medical College.....	(1937)	83.2
Baylor University College of Medicine.....	(1938)	85.5
..	(1936) 84, (1938)	86.5
..	(1938)	82.5*
..	(1938)	75*
..	(1939) 80.3,*	83.9
..	(1937)	82.1*
McGill University Faculty of Medicine.... (1938) 84.7, (1939)		85.9*

* Licenses have not been issued.

† These applicants have received the M.B. degree and will receive the M.D. degree on completion of internship. Licenses have not been issued.

‡ This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.

§ This applicant has completed the medical course and will receive the M.D. degree on passing a comprehensive examination.

Colorado July Examination

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination held at Denver, July 10-12, 1939. The examination covered eight subjects and included sixty-nine questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, eleven of whom passed and three failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College	(1938)		81
Creighton University School of Medicine.....	(1939)		80.3
McGill University Faculty of Medicine.....	(1934)		82.3
Osteopaths*	75.5, 78, 79, 80, 80.3, 82, 83.3,		83.3
FAILED		Year Grad.	Per Cent
Osteopaths*	73.5, 73.5, 74.5		

* Examined in medicine and surgery.

Pennsylvania July Examination

Dr. James A. Newpher, secretary, State Board of Medical Education and Licensure, reports the examination held at Philadelphia and Pittsburgh, July 5-8, 1939. Five hundred and twenty-five candidates were examined, 520 of whom passed and five failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine.....	(1938, 2)		2
George Washington University School of Medicine.... (1936), (1937), (1938, 12)			14
Georgetown University School of Medicine.....	(1938, 2)		8
Howard University College			3
Emory University School			1
Loyola University School			6
Northwestern University			3
Rush Medical College	(1938, 3)		3
State University	(1938)		1
University of	(1938)		1
Louisiana State University School of Medicine.....	(1939)		1
Tulane University of Louisiana School of Medicine....	(1937)		1
Johns Hopkins University School of			3
University of Maryland School of			
Physicians and Surgeons			7
Harvard Medical School.....	(1937, 2)		2
University of Minnesota Medical School..... (1938), (1939)			2
St. Louis University School of Medicine..... (1938, 6)			6
Washington University School			2
Creighton University School of			2
Columbia University College of			1
Cornell University Medical College.....	(1939, 2)		2
Long Island College of Medicine.....	(1921), (1938, 2)		3
New York University College of Medicine.....	(1935)		1
University of Rochester School of Medicine.....	(1936)		1
Duke University School of Medicine.....	(1938, 2)		2
Ohio State University College of Medicine.....	(1938, 2)		2
University of Cincinnati College of			2
Western Reserve University School			1
Hahnemann Medical College and Hos			
(1938),* (1938, 79)			81
Jefferson Medical College of F			76
Temple University School of			81
University of Pennsylvania School of Medicine.... (1937, 37), (1938, 55)			92
University of Pittsburgh School of			59
Woman's Medical College of Penns			12
Medical College of the State of So			1
Meharry Medical College			1
University of Ten			2
Medical College of			3
University of Virg			2
Marquette Univers	(1939)		1
University of Wisconsin Medical School.....	(1937)		1
University of Toronto Faculty of Medicine. (1938),* (1938, 3)			4
..	(1937)		1
..	(1938; 2)		2
..	(1937, 2), (1938)		3
..	(1938)		1
Berlin	(1936)		1
Rheinische Friedrich-Wilhelms-Universität, Bonn.....	(1938)		1
Universität Heidelberg Medizinische Fakultät.....	(1936)		1

Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1936, 2), (1937, 2)	4
American University of Beirut School of Medicine.....	(1934)	1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow.....	(1937), (1938, 2)	3
University of Edinburgh Faculty of Medicine.....	(1937)	1
Universität Zürich Medizinische Fakultät.....	(1938)	1

School	FAILED	Year Grad.	Number Failed
Temple University School of Medicine.....	(1938)		1
Medizinische Fakultät der Universität Wien.....	(1937)		1
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....	(1913)		1
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen.....	(1937)		1
Regia Università degli Studi di Palermo. Facoltà di Medicina e Chirurgia.....	(1937)		1

Six physicians were licensed by reciprocity and eight physicians were licensed by endorsement from July 28 through September 20. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Tulane University of Louisiana School of Medicine.....	(1923)		R. Island
University of Michigan Medical School.....	(1938)		Michigan
University of Nebraska College of Medicine.....	(1936)		Nebraska
University of Cincinnati College of Medicine.....	(1935)		Ohio
Temple University School of Medicine.....	(1937)		New Jersey
Marquette University School of Medicine.....	(1935)		Wisconsin

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
Yale University School of Medicine.....	(1933),	(1938) N. B. M. Ex.
Georgetown University School of Medicine.....	(1936)	N. B. M. Ex.
Johns Hopkins University School of Medicine.....	(1933)	N. B. M. Ex.
Columbia University College of Physicians and Surgeons.....	(1924)	N. B. M. Ex.
Hahnemann Medical College and Hospital of Philadelphia.....	(1938)	N. B. M. Ex.
Jefferson Medical College of Philadelphia.....	(1937)	N. B. M. Ex.
University of Pennsylvania School of Medicine.....	(1934)	N. B. M. Ex.

* Licenses have not been issued.

Nevada Reciprocity Report

Dr. John E. Worden, secretary, Nevada State Board of Medical Examiners, reports three physicians licensed by reciprocity June 20 and August 7. The following schools were represented:

School	PASSED	Year Grad.	Reciprocity with
University of Southern California School of Medicine.....	(1938)		California
Tulane University of Louisiana School of Medicine.....	(1937)		Louisiana
University of Cincinnati College of Medicine.....	(1934)		Ohio

Connecticut Homeopathic Examination

Dr. Joseph H. Evans, secretary, Connecticut Homeopathic Medical Examining Board, reports the written examination held at Derby, July 11-12, 1939. The examination covered seven subjects and included seventy questions. An average of 75 per cent was required to pass. Two physicians were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Hahnemann Medical College.....	(1938)		84.2,
(1939) 81			

Hawaii July Report

Dr. James A. Morgan, secretary, Board of Medical Examinations, Territory of Hawaii, reports the oral and written examination held at Honolulu, July 10-13, 1939. The examination covered ten subjects and included eighty questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Three physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Stanford University School of Medicine.....	(1930)		78.7
Harvard Medical School.....	(1937)		84.3
University of Michigan Medical School.....	(1935)		82.1
University of Pennsylvania School of Medicine.....	(1936)		86.2

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
Tulane University of Louisiana School of Medicine.....	(1936)	N. B. M. Ex.
Creighton University School of Medicine.....	(1935)	N. B. M. Ex.
University of Cincinnati College of Medicine.....	(1936)	N. B. M. Ex.

Book Notices

The Building of a Nation's Health. By Sir George Newman, G.B.E., K.C.B., M.D. Cloth. Price, \$6. Pp. 479, with 9 illustrations. New York & London: Macmillan Company, 1939.

Here is a complete and detailed account of the history and growth of the machinery charged with the maintenance of health in Great Britain. The author, Sir George Newman, was chief medical officer to the board of education from 1907 to 1935 and chief medical officer to the ministry of health from 1919 to 1935. The book is therefore authoritative because of his first hand association with the work it discusses. It provides also, however, an accurate history of the beginnings of the school medical service, of health insurance and of the ministry of health in Great Britain.

It is found on study of this book that English medicine and public health are governed by a variety of agencies and that it has been difficult, if not impossible, to correlate these activities with newly developed endeavors. Thus, in Great Britain as in this country, there are many different agencies involved in the care of the sick and in the prevention of disease, and the health insurance system has perhaps helped along some lines but interfered in others. Indeed, Sir George points out that the health insurance system is a practitioners' service only, without a consultative or specialist element, without laboratories or nurses or hospital accommodations for observation, and quite ineffective in developing cooperation between the insurance committees and the health authorities. There seems to be little doubt that the health insurance act has been advantageous to the medical profession and perhaps even good for the people, since it provides them with a better medical service than they had formerly, but the scheme is neither complete nor perfect. Sir George says that its medical scope is still too restricted; there is observable too great a tendency to the "bottle of medicine" treatment as palliative, and the accurate diagnosis, effective treatment and actual preventive measures are sometimes conspicuous by their absence. He believes that some thousands of the eight million patients dealt with under this act are not really satisfied "not because they do not get well but because they do not receive the attention which they expected." He then continues: "Every unsatisfied patient is, de facto, a criticism of his doctor. In private practice that is his own affair; but in a state system of practice, in which the treatment has been already paid for, it becomes a breach of contract, damaging to the doctor, the service and the state. Again, public opinion declares that a substantial number of practitioners are careless, even negligent, in their insurance practice, that some panels are too large to ensure adequate attention to the individual patient, that the sickness and 'incapacity' certificates are granted too liberally, that 'multiple surgeries' are disadvantageous, and that large 'firms' of insurance practitioners exclude 'freedom of choice' of doctor by the patient. The approved societies have more than once complained of excessive certification of 'incapacity' (resulting in undue payment of cash benefit) and excessive prescribing. Both of these complaints were fully investigated by the ministry (1927-1931) and both were proved to be justified."

In the final section of his book, entitled "Whence and Whither?" Sir George provides an analysis of the chief gains made in the field of preventive medicine. The first three practical health movements were for sanitation and sanitary cleanliness, the establishment of primitive hospitals, and the practical knowledge of the contagiousness of disease and the necessity for quarantine. Then came water supply. Next came notification of infectious diseases and registration of the cause of death. Next came vaccination for smallpox and thereafter control of the wholesomeness of food, meat and milk, reform in housing, improvement in lighting, ventilation, cleanliness and reduction of overcrowding. The great problem remaining for legislative control, he says, was provision of effective medical treatment of the sick. As evidence of the accomplishments, Sir George analyzes the sickness and death rates so far as they are available, and he cites these benefits to prove that the intervention of the state in behalf of national health has had a beneficial effect. He fails, however, as a scientist should, to take account

of the fact that similar, if not better, results have been achieved in some nations where the state has not intervened to nearly the same extent.

He feels that national health depends first on knowledge of the science and art of medicine and then on its social application by the medical practitioner, by the state and by the people of that state. What is still needed is better application by the state and wider usage by the people. He makes a great plea for education of all the people in the science and art of health.

L'examen du malade: Guide clinique de l'étudiant et du médecin. Médecine, chirurgie, obstétrique, neurologie et spécialités. Par MM. P. Delmas et al professeurs à la Faculté de médecine de Montpellier. Second édition. Paper. Price, 45 francs. Pp. 365. Paris: Masson & Cie, 1939.

It seems that the most cogent criticism of the manual is to be found in its subtitle: "Clinical Guide for Students and Physicians in Medicine, Surgery, Obstetrics, Neurology and Specialties." In other words, the scope of the compendium, intended primarily for the use of medical students and interns, is to describe history writing in cases belonging either to one of the fields mentioned or to dermatology, pediatrics, otorhinolaryngology, ophthalmology or gynecology. Moreover, the present edition has been enlarged by addition of chapters on psychiatry and endocrinology. The author and his collaborators had no intention of offering a treatise on symptomatology or diagnosis and limited themselves to showing the intern how to interrogate and examine the patient and to record the results. The concise epitome has been written in a simple, succinct manner but the enormous field covered and the small format of the book exclude an adequate discussion of many subjects. Perusal of numerous sections chosen at random reveals that much essential information has been omitted. For instance, in the discussion of leukorrhea on page 146 *Trichomonas* infection is not mentioned as the possible source of the vaginal discharge. Not less than ninety-three pages is devoted to the description of normal laboratory observations and indications for various research methods, without mentioning how to perform the tests. Owing to the vastness of the material, only few chapters cover the subject in a more than elementary manner; on the whole, the usefulness of the manual will be limited to beginners, to whom it may prove to be a handy guide.

Psychological Factors in Marital Happiness. By Lewis M. Terman and others. Cloth. Price, \$4. Pp. 474, with 28 illustrations. New York & London: McGraw-Hill Book Company, Inc., 1938.

In this book the authors discuss the marital satisfaction experienced by 2,484 subjects, including 1,133 married couples and 109 divorced couples. The technic used was psychometric. The various chapters describe the psychologic factors in marital compatibility and the development of an index of marital happiness. There are studies of the personalities of happily married and unhappily married people, with special relation to the family background. Then there are four chapters dealing with sexual factors. Here the authors discuss sleeping arrangements, contraceptive technics, sexual complaints and similar matters.

In estimating their index of marital happiness, the authors concern themselves with such matters as customary methods of settling disagreements, regret of marriage, choice of spouse if life was to be lived over, and a complete score based on domestic grievances. The happiness index and the personality tests are also significant. The authors found, for example, that the presence of children often prevents the breaking up of marriage but that it has little effect on the general level of marital happiness. Much nonsense has been written, they say, about the risks entailed in marrying on an inadequate income or marrying out of one's age or educational group. The correlation of income with happiness is zero. The happiest wives are from four to ten years older than their husbands; the happiest husbands are twelve or more years older than their wives. As for religious training, they say that if this was ever a factor in marital happiness it appears no longer to exert such an influence. As to relative mental ability, the most favorable condition is equality or near equality. Marked mental superiority of the husband makes for happiness in the wife but for unhappiness in the husband. Marked inferiority of the husband makes the wife unhappy but does not greatly affect the husband.

The ten background circumstances most predictive of marital happiness are:

1. Superior happiness of parents.
2. Childhood happiness.
3. Lack of conflict with mother.
4. Home discipline that was firm, not harsh.
5. Strong attachment to mother.
6. Strong attachment to father.
7. Lack of conflict with father.
8. Parental frankness about matters of sex.
9. Infrequency and mildness of childhood punishment.
10. Premarital attitude toward sex that was free from disgust or aversion.

Most significant is the conclusion of the authors that sex technics, which many writers regard as the primary key to happy marriage, may be worth cultivating for their immediate sensuous returns but exert no appreciable effect on happiness scores. It is interesting to realize that about 33 per cent of women fail to achieve sexual satisfaction in marriage.

The authors find that the key to happiness in marriage is not to be found in sexual compatibility and, in fact, is no greater than that of the combined personality and background factors and is probably less. It is interesting to note that one of the most important factors is such a small matter as the wife's slovenliness in appearance. This book contains a vast amount of important data and suggestions for physicians who may frequently be concerned with these problems.

Practice of Allergy. By Warren T. Vaughan, M.D. Cloth. Price, \$11.50. Pp. 1,082, with 338 illustrations. St. Louis: C. V. Mosby Company, 1939.

In 1930 the author published a book on allergy and applied immunology, and a second edition came out in 1934. Both those works were planned for physician and patient, but now allergy has advanced so greatly that a volume of almost 1,100 pages is needed to present the subject as it concerns the physician alone. The physician who specializes in allergy must nowadays be not only an internist but also thoroughly familiar with the diseases of the skin and those that affect children and must have more than an ordinary knowledge of the conditions affecting the nose and throat. In addition, he must have a good knowledge of botany, bacteriology and parasitic conditions. In this work the author first presents the history and basis of his subject and then proceeds to diagnosis, food allergies, conditions developed by pollens and by bacteria pharmacology, and the specific allergic diseases. The work is supplemented with a bibliography and an excellent index. An added feature is a collection of excellent portraits of pioneers in this field. The author's personal experience is reflected throughout the book. The records of his cases, supplemented by excellent photographs, make the volume individual beyond most other textbooks in this field. Any physician who wishes to have easily available a complete reference work on this subject will do well to avail himself of what Dr. Vaughan offers. The amount of detailed information is vast and is not available elsewhere under one cover.

Money to Burn: What the Great American Philanthropic Foundations Do with Their Money. By Horace Coon. Cloth. Price, \$3. Pp. 352. New York, Toronto & London: Longmans, Green & Co., 1938.

For some time there has been intense interest in the question as to what place will be occupied in the future by the great foundations established by the multimillionaires of the past. The author begins by describing the development of the various foundations and their relationship to the law. Then he discusses particularly the Carnegie and Rockefeller Foundations, including the General Education Board. Unfortunately, he has depended primarily on the *New York Times* for his information, and therefore much of what he says is colored by the established policies of that paper. A small space is devoted to the Duke Foundation, the Brookings Foundation, the Spelman Fund, the Twentieth Century Fund, Chemical Foundation and others. The chapter called "Public Health and Private Philanthropy" is full of misstatements of fact and inconsistencies and indicates the very casual manner in which the whole book is written. The statement is made that the federal government appropriates less than \$5,000,000 a year for public health, whereas the actual amount spent by the federal government is more nearly \$125,000,000 a year. In

this chapter the author discusses principally the Rockefeller Foundation and the Commonwealth Fund. The discussion of the Milbank Fund is a defense of Kingsbury vs. the American Medical Association. Here the author apparently accepts what has been said by Rorty as gospel and repeats all the unestablished charges relative to boycotts of the Borden Company. Next comes a statement relative to the Kellogg Foundation and the American Foundation. The entire chapter is obviously taken by the author out of the *New York Times*, and the resulting pathologic specimen is just what any physician with a knowledge of genetics would expect. The book ends with a sort of conclusion that multimillionaires give their money to foundations in order to help protect the money that they do not give away. The author apparently believes that the government should take over the foundations in some manner because they are indirectly perpetuating monopolies.

Sleep and Wakefulness as Alternating Phases in the Cycle of Existence. By Nathaniel Kleitman, Department of Physiology, The University of Chicago, Chicago. Cloth. Price, \$5. Pp. 638, with 33 illustrations. Chicago, Illinois: University of Chicago Press, 1939.

Among a mass of literature on sleep published in recent years the book by Kleitman comes as a refreshing, scientific document in the midst of theory, superstition and suggestion. The author, who is associate professor of physiology at the University of Chicago, has done sixteen years' observational and experimental work on this subject. He provides evidence of the functional differences between wakefulness and sleep and discusses the periodicity of sleep and the factors that disturb the sleep-wakefulness cycle. He also discusses states resembling sleep, such as hibernation and hypnosis, and concludes with an analysis of the various theories of sleep. An exceedingly practical chapter deals with the hygiene of sleep. The book is complete with a bibliography and an index. The book is beautifully printed, the style is excellent and the reasoning is sound. The author concludes that cortical dominance is the principal feature in the development of the vertebrate nervous system and is also the determining factor in prolonging the time allotted to the wakefulness phase and in adapting the rhythm of sleep to the diurnal alternation of night and day. He has proved by physiologic experiments many facts which people frequently find out for themselves. For example, if a drowsy person is removed from the influence of light and sound and assumes a horizontal position on a comfortable bed, he will not need anything to produce the onset of sleep. The sleep problem is not solved by the research here presented because there are still many facts that only scientific experimentation can establish, but this volume comes nearer to being a scientific evaluation of all the facts heretofore accumulated than any other work on the subject thus far available.

Künstliche Fiebererzeugung mit Kurzwellen: Kurzwellen-Hyperthermie. Von Dozent Dr. med. habil. Ernst Raab. Boards. Price, 5.50 marks. Pp. 158, with 36 illustrations. Leipzig: Georg Thieme, 1939.

This textbook on the artificial production of fever by means of short radio waves is the first comprehensive work on fever therapy to appear in Germany. The information contained in it is based to a certain extent on personal researches of the author, which have been performed with apparent enthusiasm. The book is divided into two sections: the first deals with the various methods of production of artificial fever and the second concerns the clinical applications of fever therapy. There is a description of the historical developments of artificial fever, a chapter on the production of fever by chemical means and, following this, chapters dealing with the various physical methods of fever production. The use of radiant heat and hot baths is mentioned, and the Kettering hypertherm (hot, humid air cabinet) is described briefly. The author apparently has a wrong conception of this device, since he argues that because it never has been marketed commercially it probably is not a satisfactory apparatus. As a matter of fact, the device was prepared simply as an apparatus to be used in research, and a number of commercial concerns now manufacture appliances which embody its principles.

The author lays particular stress on the production of fever by short wave diathermy, and ample reference is made to the work of American authors. Strangely enough, certain earlier publications in the author's own language, such as those by

Köhler of Geneva and those emanating from the neurologic clinic in Vienna, have not been mentioned by the author. He presents a careful description of the differences between the production of fever by means of the condenser field and the electromagnetic field. Such descriptions previously have been presented not only by Kowarschik in Vienna but also by certain American authors. Although the author admits that he has not employed the method himself, he criticizes the technic of fever production by means of short wave diathermy as employed by certain French authors. Whereas he is naturally enthusiastic about his own technic, which would seem adequate, nevertheless, probably because of unfamiliarity with other methods, he seems to be too critical of certain excellent methods of production of fever. According to the technic of the author of this work, the patient is placed in a fever bag, which is closed by means of a slide fastener and lies on a hammock-like table. The author employs a two tube short wave diathermy machine, the energy output of which is divided into two portions and is conveyed to the patient by means of two coils. The author reports that he has had no severe complications or deaths in about 700 treatments. The systemic temperature of the patient is raised to 40 or 41 C. (from 104 to 106 F.) and is maintained for several hours. The author cites instances in which this technic has been employed in the treatment of patients more than 60 years of age without untoward complications. In a special chapter, physical fevers are compared to artificial fevers produced by malaria. The author is strongly in favor of the use of physical fevers. In the section on clinical uses of hyperthermy by means of short wave diathermy, brief descriptions of the various conditions in which the treatment is considered indicated precede discussion of the treatment.

Whereas, especially in discussing the treatment of certain of these diseases by means of fever therapy, the author rather limits himself, he has drawn freely on the statistical studies of American authors for support of his conclusions. Among the diseases for which fever therapy is recommended are listed cerebrospinal syphilis, gonorrhea, arthritis, multiple sclerosis, chorea, poliomyelitis and neuritis. As the first German textbook on this subject, the volume may be considered a valuable contribution and any one interested in fever therapy will find much of interest in it.

We Didn't Ask Utopia: A Quaker Family in Soviet Russia. By Harry and Rebecca Timbres. Cloth. Price, \$2.50. Pp. 290. New York: Prentice-Hall, Inc., 1939.

This volume comes with an introduction by Walter Duranty, who certainly knows about Russia, and Dr. C.-E. A. Winslow, who knows the authors and who met them at the Hotel National in Moscow in 1936. The book includes the letters of Mr. Harry Timbres, the journal of his wife, and some reference to their children. The authors, who are Quakers, went to Russia to study the system and particularly to look at socialized medicine. Harry Timbres was interested in the prevention of malaria, and shortly after their arrival in Russia they made contacts with Russian health authorities and with Dr. Sigerist. The letters give a clear picture of events in Russia and particularly of the antimalaria work. The journal of Rebecca Timbres reveals much more of Russian habits of mind and of the conditions than do the letters of Harry Timbres. It is interesting to read at this time Litvinov's statement on war and to realize how far Russia has departed from that point of view. There is an interesting letter from the author to Dr. John Kingsbury, in which he points out that the Russian system does not supply any of the element of personal touch which characterizes private practice at its best and also gives his opinion that Russia had better work out the system before America experiments with it. The book reveals also the primitive conditions of living and inadequacy of food which must prevail among the mass of the people. The author and his wife had to use one half of their entire income, while working for the health of Russia, to purchase the limited food that was required by the family. Saddest of all in this work is the description of the ultimate infection and death of Harry Timbres, particularly his refusal to go to the Marburg Hospital after he developed typhus, and his desire to go to the University Hospital at Kazan. This book is revealing in more ways than one on the Russian medical system and on the American interests which would transfer that system to this country.

Secretarial Efficiency. By Frances Avery Faunce. With the collaboration of Frederick G. Nichols. Cloth. Price, \$3.50. Pp. 601, with illustrations. New York & London: Whittlessey House, McGraw-Hill Book Company, Inc., 1939.

The author has been secretary to the editor of the *Atlantic Monthly* and assistant to the business manager of Wellesley College. These two jobs ought to indicate that she herself is efficient. Her book offers a vast amount of advice to the girl who wants to rise in the profession of secretary and includes a discussion of important traits. Incidentally, she also discusses such detailed matters as the way in which the girl receiving dictation ought to sit, and she even discusses the executive who begins to dictate before the girl has time to sit. She mentions all the things that a secretary should ask the executive after he has finished his dictation so as to remind him of what he forgot. There are discussions of spelling, spacing, memorandums, telephone, handling of callers, making of files and appointments, and there is even a section on what the secretary is to do with her spare time, if any. The book has so much to say about so many little things which are significant in the life and work of a secretary that it is bound to be helpful to any secretary who has intelligence enough to be an efficient secretary in the first place.

Surgery of the Eye. By Meyer Wiener, M.D., Professor of Clinical Ophthalmology, Washington University School of Medicine, St. Louis, and Bennett Y. Alvis, M.D., Assistant Professor of Clinical Ophthalmology, Washington University School of Medicine, St. Louis. Cloth. Price, \$8.50. Pp. 445, with 396 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

For many years the American ophthalmologist has awaited a surgery of the eye which would not be a translation of a foreign textbook and which also would give in simple but descriptive words a practical treatise which could be used in everyday work. The authors of this small volume have achieved such an ideal. In addition the written technic has been combined with excellent drawings of the various stages in many operative procedures. This emphasis on clarity has made manifold the value of the book. Perhaps the most striking peculiarities of the text are the enunciation of surgical principles, the items of personal experience found inserted from time to time in all portions and the dogmatic statements of tried and proved methods which the authors have experienced in a long and busy surgical eye practice. In scope the authors have left little to be desired. Indeed no ophthalmologist in an English speaking country can afford to leave such a textbook off his "must" list.

Epidemic Encephalitis: Etiology, Epidemiology, Treatment. Third Report by the Matheson Commission. Willard C. Rappleye, Chairman. Fabrikoid. Price, \$3. Pp. 493. New York: Columbia University Press, 1939.

This is a complete contribution on epidemic encephalitis. It is the third report of the Matheson Commission and comprises etiology, epidemiology and treatment. It consists of five chapters: (1) the work of the commission; (2) summary of investigation on etiology of encephalitis due to epidemic, St. Louis type, Japanese B, equine encephalomyelitis, postvaccinal and postinfectious, hemorrhagic and Australian X-disease; (3) various allied diseases such as louping ill, lymphocytic choriomeningitis and the Guillain-Barré syndrome; (4) summary of the treatment of encephalitis with a description of about forty-eight methods of treatment; (5) epidemiology of epidemic encephalitis, St. Louis and Japanese B types of encephalitis. There is a comprehensive bibliography of about 3,510 papers on encephalitis. There is an excellent index. This book is recommended to all medical men as well as to bacteriologists, neurologists and pathologists.

Microbiology Applied to Nursing: A Combined Text Book and Laboratory Guide. By Jean Broadhurst, Ph.D., Professor of Bacteriology, Teachers College, Columbia University, New York, and Lella I. Given, R.N., M.S., Professor of Nursing Education, and Director, Department of Nursing Education, South Dakota State College. Fourth edition. Cloth. Price, \$3. Pp. 653, with 316 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1939.

The publication of this edition furnishes adequate recognition of the book's usefulness for the purpose for which it is designed. It is clearly written and well arranged to accompany the lectures and that small amount of laboratory work available to student nurses who must obtain some knowledge of the fundamentals of bacteriology.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Harrison Narcotic Act: Right of Florida Naturopaths to Registration.—The attorney general of Florida rendered an opinion to the effect that naturopaths may not prescribe or dispense narcotic drugs in the state. Basing his action on this opinion, the United States Collector of Internal Revenue for the District of Florida undertook to cancel naturopath Perry's registration under the Harrison Narcotic Act and to compel him to surrender the special narcotic stamp and order forms previously issued to him. The collector, too, refused to register naturopath Detwiler under the act. Each naturopath instituted suit against the collector in the United States district court, Florida, southern division, and the suits were consolidated for hearing.

The Harrison Narcotic Act provides that "physicians . . . and other practitioners, lawfully entitled to distribute, dispense, give away, or administer" narcotic drugs are entitled to register with the collector and receive from him a special stamp and order forms to be used in the purchase of narcotics. Who are physicians or other practitioners, the court pointed out, is to be determined by the law of the state where the applicant resides. The Florida narcotic act provides that the term "'physician' means a person authorized by law to practice medicine in this State and any other person authorized by law to treat sick and injured human beings in this State and to use, mix or otherwise prepare narcotic drugs in connection with such treatment." The Florida naturopathic act defines the word "naturopathy" to mean "the use and practice of psychological, mechanical and material health sciences to aid in purifying, cleansing and normalizing human tissues for the preservation or restoration of health according to the fundamental principles of anatomy, physiology and applied psychology, as may be required." Naturopathic practice, as recognized by the act, employs among other elements phytotherapy, which, the court said, means treatment by means or with the aid of plants or remedies of botanic origin. The naturopaths contended that phytotherapy embraces all botanic preparations and their compounds, including morphine, a derivation of opium, which in turn is a product of botanic origin, and that therefore they were authorized to prescribe and administer morphine and other narcotics of botanic origin.

The Florida naturopathic act, the court said, clearly does not recognize naturopaths as medical doctors, nor the practice of naturopathy as the practice of medicine. On the contrary, it authorizes licensees thereunder to practice the art of healing only in a limited and defined field called "naturopathy." That act, immediately after recognizing phytotherapy as a permissible method of treatment in naturopathy, continues with the following proviso: "Provided, however, that nothing in this Chapter shall be held or construed to authorize any naturopathic physician licensed hereunder to practice materia medica or surgery . . ." Literally, the court pointed out, materia means "medical material." To practice materia medica is to engage in that branch of medical science which deals with drugs, their sources, preparations and uses. The proviso is an express limitation on or qualification of the general authority of naturopaths as expressed in the general enacting clauses which precede the proviso. Though phytotherapy relates generally to healing with the aid of remedies of botanic origin, whatever is included in the practice of materia medica, that is, that branch of medical science which deals with drugs, their sources, preparations and uses, is expressly forbidden to naturopaths by the proviso. The act authorizes naturopaths to deal with botanic remedies contemplated by phytotherapy, exclusive of those embraced in materia medica. The situation is not altered by the fact that narcotics are used merely as a palliative to overcome pain rather than as a specific treatment for an ailment, the court said.

The Florida naturopathic act, while referring generally to phytotherapy as embraced within the practice of naturopaths,

does not, in prescribing a course of study for naturopaths, include botanic compounds or extracts generally, nor narcotics. This omission, the court thought, was in harmony with the restrictive proviso which prohibits the practice of materia medica by naturopaths. If naturopaths are to prescribe or dispense narcotic drugs in Florida, the court concluded, they must first secure legislative authority.

Judgment in each case was rendered for the defendant Collector of Internal Revenue. Naturopath Perry appealed to the United States circuit court of appeals, fifth circuit, which affirmed the judgment of the district court.—*Perry v. Larson, Collector of Internal Revenue; Detweiler v. Same*, 25 F. Supp. 728; *Perry v. Larson, Collector of Internal Revenue*, 104 F. (2d) 728.

Malpractice: Infection Following Hypodermic Injection of Morphine.—The plaintiff sued the defendant physicians, alleging that an infection in his arm was due to the negligence of the physicians' employees in administering morphine hypodermically. At the conclusion of the plaintiff's evidence, the trial court instructed a verdict for the physicians on the ground that the plaintiff offered no expert medical testimony that the infection in his arm was caused by anything done or omitted to be done by the physicians or their employees, and on the ground that there was no evidence showing a causal connection between the wrong complained of and the injury resulting. The plaintiff then appealed to the court of civil appeals of Texas, Austin.

In the case of *Floyd v. Michie*, 11 S. W. (2d) 657, said the court in the present case, it was held:

The law entertains in favor of a physician the presumption that he has discharged his full duty, and to defeat this presumption the law exacts affirmative proof of breach of duty coupled with affirmative proof that such breach of duty resulted in injury. Negligence is never imputed from results, nor is any inference thereof indulged in against a physician . . . To warrant the finding of civil malpractice there must be expert medical testimony to establish it and to establish the additional fact that death resulted from such malpractice. There being no expert medical testimony establishing such issues, the court properly instructed a verdict for the defendants.

In the present case, there was no testimony by a medical expert that the infection in the plaintiff's arm was caused by the hypodermic needle or that it resulted from negligent acts of the defendants.

What is an infection and whence it comes are matters determinable only by medical experts. As applied in the present case, infection, the court said, means internal inflammation where pus is formed by the presence of pus germs. Without medical testimony as to the probable cause of an infection or its source, the court and jury are not qualified to pass on the question. The mere fact that infection set up in the plaintiff's arm three or four days after a hypodermic needle had been injected will not suffice as proof of negligence in failing to sterilize the needle or skin of the plaintiff's arm before the injection. Infection comes from many sources, and there must be affirmative proof of such negligence or lack of care, and that the injuries complained of resulted therefrom. Such proof can be established only by the testimony of experts skilled in the medical and surgical profession.

The judgment of the trial court was affirmed.—*Kaster v. Woodson et al. (Texas)*, 123 S. W. (2d) 981.

Workmen's Compensation Acts: Melanocarcinoma Attributed to Constant Irritation of Mole.—The employee was engaged in the operation of machinery used in the manufacture of building blocks of sand, ashes and cement. Sand and ashes accumulated where he stood and some would get into his shoes, requiring him to empty them several times a day. On July 15, 1936, according to his testimony, he found at the end of the day's work on removing his sock that it stuck to a congenital mole on his left foot, that a tan colored stain was left on the mole where the sock had covered it and that there were sand and ashes around it. He testified that in the afternoon of that day he had felt pain at the site of the mole but that it did not bother him thereafter, except a "little bit," nor prevent his continuing at his work for several

weeks. About four weeks thereafter the mole started to "ooze," and he consulted a physician who advised him to go to a hospital. He did so two days later and remained there for three days, during which time the mole was cut out. Six weeks later he returned to the hospital and a further and more extensive operation was performed on his foot and leg. The attending physician diagnosed the condition as melanocarcinoma. The employee was denied compensation under the workmen's compensation act of New Jersey; the trial court affirmed that denial and the employee brought the judgment of the trial court for review before the supreme court of New Jersey. Subsequently the employee died, death being caused by the melanocarcinoma.

The employee's condition, in the opinion of the supreme court, was caused by the constant irritation of the mole by the sand and ashes with which it came in contact. It was not of accidental origin within the meaning of the workmen's compensation act but rather was an occupational disease for which no compensation was provided by the act. The first symptoms, the sticking of the sock to the mole and the stain on the mole, were not accompanied by any fall, blow or other trauma.

Because there was no accident that caused the disease or that caused a latent condition of the disease to flare up, the judgment of the trial court for the employer was affirmed.—*Bollinger v. Wagaraw Bldg. Supply Co. (N. J.)*, 3 A. (2d) 810.

Workmen's Compensation Acts: Refusal of Employee to Submit to Operation.—An employee, said the court of appeal of Louisiana, cannot under the provisions of the workmen's compensation act be required to submit to an operation to relieve a disability when the medical testimony shows that the operation will be accompanied by great pain and may seriously endanger life, or when there is doubt as to the removal of the disability by the operation. In such a case the employee is not required to endanger his life or gamble with his chance of recovery by submitting to a dangerous and uncertain operation. But when the medical testimony shows that the operation is a minor one, unattended by danger of any serious consequences, with little pain and suffering and with almost a certainty of success and relief from the disability, it would be unfair and inequitable for the employee to continue to draw full compensation when he had it within his power to minimize the damage by submitting to a minor and relatively simple operation.—*Leday v. Lake Charles Pipe & Supply Co. (La.)*, 185 So. 655.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otolological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Altan Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Section, American Laryngological, Rhinological and Otolological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

18: 261-388 (Sept.) 1939

- Factors Influencing Auricular Murmur and Intensity of the First Heart Sound. E. A. Stead Jr. and P. Kunkel, Boston.—p. 261.
Effect of Posture on Form of Precordial Leads of Electrocardiogram. H. J. Stewart and R. L. Bailey, New York.—p. 271.
Infra-Red Photographic Demonstration of Superficial Venous Pattern in Congenital Heart Disease with Cyanosis. B. S. Epstein, Brooklyn.—p. 282.
Plethysmographic Studies of Peripheral Blood Flow in Man: III. Effect of Smoking on Vascular Beds in Hand, Forearm and Foot. D. I. Abramson, Cincinnati; H. Zazecia and B. S. Oppenheimer, New York.—p. 290.
*Heart Sounds in Young Adults. H. A. Sacks and R. C. Roberts, Chicago.—p. 303.
Significance of Duration of Q_s with Respect to Coronary Disease. R. H. Bayley, New Orleans.—p. 308.
Treatment of Occlusive Arterial Disease of Legs by Means of Sanders Vasocillator (Sanders Bed). N. W. Barker and Grace M. Roth, Rochester, Minn.—p. 312.
Syndrome of Superior Vena Caval Obstruction. L. A. Soloff, Philadelphia.—p. 318.
Cold Pressor Reaction in Normal Subjects and in Patients with Primary (Essential) and Secondary (Renal) Hypertension. J. H. Miller and M. Bruger, New York.—p. 329.
Clinical Significance of Right Axis Deviation in Electrocardiogram. W. J. Comeau and P. D. White, Boston.—p. 334.
Precordial Electrocardiogram in Myocardial Infarction: II. Observations on Cases of Infarction of Posterior Wall of Left Ventricle. C. E. Kossmann and C. E. de la Chapelle, New York.—p. 344.
Id.: III. Observations on Cases in Which Lesions Were Diffuse. C. E. Kossmann and C. E. de la Chapelle, New York.—p. 352.
Method for Study of Ventricular Fibrillation. B. Blumenthal and Enid Tribe Oppenheimer, New York.—p. 363.

Heart Sounds in Young Adults.—Sacks and Roberts used the stethograph in determining the characteristics and time relationships of the heart sounds of 110 normal young adults (medical students) and the significance of systolic and diastolic vibrations, exclusive of the heart sounds themselves, occurring in the absence of audible murmurs. All records examined revealed a normal sinus rhythm, with the heart rate varying from 60 to 90 beats a minute. Sixty-eight records (61.8 per cent) showed vibrations during systole. These varied in number from four to twenty-six. Systolic murmurs were audible in ten instances (9 per cent) and examination of the stethograms of these subjects revealed that from sixteen to twenty-six systolic vibrations were present in every record. In the other fifty-eight cases in which there were systolic vibrations and no audible murmur, only twelve records resembled those obtained from the subjects with audible systolic murmurs. The inaudible systolic vibrations occurred more often in the asthenic type of individual. Early diastolic vibrations were present in fourteen cases (12.7 per cent). The maximal number of vibrations recorded was from eight to ten. In no instance was a diastolic murmur audible through the stethophones. The systolic vibrations found in the normal subjects with records of organic murmurs were compared with those found in fifty cases of organic heart disease in which there were obvious systolic and diastolic murmurs. In the majority of the cardiac cases an organic systolic or diastolic murmur was represented by from sixteen to forty-four vibrations. Thus it became clear that 20 per cent of the total normal group had from sixteen to twenty-six systolic vibrations that could not definitely be distinguished from the recorded murmurs of organic heart disease. However, the well defined organic murmurs usually had more vibrations and were of longer duration. The results suggest that, in the interpretation of stethographic records, systolic vibrations should not be regarded as actual murmurs unless there are at least sixteen regular oscillations. A few irregular oscillations in systole or diastole may be due to the impact of the apex against the wall of the chest or to other extracardiac factors.

American Journal of Cancer, New York

37: 1-172 (Sept.) 1939

- Myeloid Leukemia and Nonmalignant Extramedullary Myelopoiesis in Mice. W. A. Barnes and I. E. Sisman, New York.—p. 1.
Tumor Induction and Tumor Growth in Hypophysectomized Mice. R. Korteweg and F. Thomas, Amsterdam, Netherlands.—p. 36.
Lymphoblastoma in Mice Following Administration of Carcinogenic Tar. A. M. Brues and Beula B. Marble, Boston.—p. 45.
Relation of Vitamin B Complex to Tumor Growth. F. Bischoff and M. Louisa Long, Santa Barbara, Calif.—p. 54.
Properties of the Inhibitor Associated with Active Agent of Chicken Tumor I. A. Claude, New York.—p. 59.
*Evaluation of Risk of Biopsy in Squamous Carcinoma: Clinical Experiment. R. Paterson and J. R. Nuttall, Manchester, England.—p. 64.
Cytology of Tumor Cell in Rous Chicken Sarcoma. M. Levine, New York.—p. 69.
Effect of Anol on Growth of Mammary Gland. E. T. Gomez and C. W. Turner.—p. 108.
Experiments in Homologous Transmission of Lymphoblastic Leukemia in a Calif. J. Stasney, W. H. Feldman and W. C. Popp, Rochester, Minn.—p. 114.

Risk of Metastasis from Biopsy.—Paterson and Nuttall compared the incidence of metastases in patients with similar lesions but divided into two groups, in one of which biopsy was performed and in the other it was not. A number of conditions had to be met, which limited the choice of cases suitable for analysis. A type of tumor which habitually metastasized in a readily recognizable way was essential in order that the patients might be followed up in a routine clinical manner without requiring special examinations at each visit. The patients chosen suffered from malignant disease of the skin, mouth, lips and penis. The biopsy group included only squamous cell carcinoma. The study thus became one on the risk of biopsy in squamous carcinoma rather than a general study of biopsy risks. Early lesions of suitable type with no involvement of lymph nodes undergoing treatment by radium molds were alternately sectioned and not sectioned before application of the mold. The time between treatment and analysis varied between one and a half and four and a half years. Such an interval was considered to be long enough for metastases to appear if they were going to occur, though occasionally much greater intervals have been recorded. At the end of two years 202 cases had been listed. Thirty-six did not fulfil all the criteria. Of the remaining 166 cases, biopsies were done in ninety-nine and they were not done in sixty-seven cases. Of the group in which biopsy was done metastases developed in 19 per cent as compared with 20.5 per cent in the group without biopsy. This discrepancy is well within the limits of casual error of a limited sample. The number of patients less than 45 years of age is small, but it is interesting that no metastases occurred in this group. The incidence in the other two age groups (from 45 to 65 and more than 65) is reasonably equal. The fact that the percentages were fairly constant in all the subgroups the authors believe is an additional indication that the figures are representative and not accidental. The purity of the samples and the fact that the higher figure for metastases occurs in the group without biopsy provide substantial evidence against the belief that biopsy causes metastasis in any appreciable percentage of these (squamous carcinoma) cases.

American Journal of Public Health, New York

29: 1083-1192 (Oct.) 1939. Partial Index

- *Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, 1937-1938. Beatrice F. Howitt, San Francisco.—p. 1083.
Detection of Trichinella Infestation in Hogs by Intradermal Test. A. Lichterman and I. Kleiman, New York.—p. 1098.
Experimental Infection of Dermacentor Andersoni Stiles with Virus of Lymphocytic Choriomeningitis. H. J. Sbaughnessy and A. Milzer, Chicago.—p. 1103.
The Physician's and Nurse's Part in Health Education. Dorothy Nyswander and M. Derryberry, Washington, D. C.—p. 1109.
Bacteriologic Tests on Mechanical Dishwashers for Home Use. W. E. Ward and G. M. Dack, Chicago.—p. 1114.
*Active Immunization Against Diphtheria: Efficacy of Several Methods Used in a City of Medium Size. F. K. Harder, A. Gelperin and W. R. Cook, Cincinnati.—p. 1119.
Similarity of Chronic Infections with Salmonella Typhimurium and Tuberculosis in Guinea Pigs. E. A. Birge, Madison, Wis.—p. 1125.
Meningococcal Meningitis in the District of Columbia. C. C. Dauer, Washington, D. C.—p. 1140.
*Occurrence of Atmospheric Lead Resulting from Use of Colored Blackboard Crayons. H. W. Ruf and W. Z. Fluck, Madison, Wis.—p. 1149.

Encephalitis Viruses in California.—Howitt reports that during the summer and autumn of 1937 physicians in California reported a number of cases of acute encephalitis, in some of which the course was stormy and in others less violent. There

were forty deaths. Most of the cases occurred in Fresno and Tulare counties. During the same seasonal period in 1938 a similar type of disease was recorded showing both the severe and the milder forms. Fresno and Tulare were again affected, with additional patients from Kern County. The western strain of the equine virus was recovered from the brain and the blood, respectively, in two cases. Both strains were shown to be immunologically and serologically similar to the virus of equine origin. Positive neutralization to the St. Louis virus was obtained in forty-nine (47.5 per cent) of 103 serums and positive neutralization to the equine virus (Br) in thirty-two (37 per cent) of eighty-six serums. Of a total of sixty-three apparently normal persons, contacts and noncontacts, residing in both the Bay Region and the San Joaquin Valley districts, eight had neutralizing substances for the St. Louis virus and one for the equine. With the exception of one for the St. Louis type, all of the group with positive reactions resided in the valley. Of a total of forty-seven persons tested for equine virus and sixty tested for the St. Louis strain among groups with a condition diagnosed as poliomyelitis in both regions, the only subjects with serums positive for either virus were residing in the San Joaquin Valley. Fourteen of twenty-one serums positive to the Br equine strain also gave strongly positive neutralization with the western virus of equine origin (Californian), while four were weakly positive. Neutralizing antibodies for the Br equine virus could be obtained as early as eight days after onset of the disease and were found in some persons one, two and even three years after recovery. The predominance of positive reactions for the St. Louis virus was among the older people, while that for the equine was among the younger. No definite relationship was noted between cases of the equine disease in horses and those in man. Swampy lands and many mosquitoes were closely associated with the districts affected. From the epidemiologic evidence it seems likely that the equine virus was transmitted to man through some vector. The St. Louis strain was brought in by the migrant labor population.

Active Immunization Against Diphtheria.—In a test survey for determining the efficacy of several methods of active immunization against diphtheria Harder and his associates compare the artificial and the natural immunity (as measured by the Schick test) of 544 noninoculated children, 208 receiving four injections of toxin-antitoxin, 735 given three injections of toxin-antitoxin, 650 given two injections of Ramon toxoid and 219 given one injection of alum-precipitated toxoid. The observations in the various groups were not exactly comparable because the intervals of time between administration of the various antigens and testing were not always the same. Nevertheless, it was possible to reach certain conclusions. Each of the groups of inoculated children showed a definitely higher level of immunity than the control group. This was particularly significant because the controls were older and therefore had a higher level of natural immunity. The relatively good results in the group that received one injection of alum-precipitated toxoid may have been due to the short interval of time between inoculation and testing (one year or less). The somewhat poorer results in the group given two injections of Ramon toxoid may have been due to the younger age of the members of this group or to the fact that they received only two injections one week apart. The results in the group which received toxin-antitoxin were relatively final and represented the resultant immunity status after primary stimulus and natural immunization had reacted over a substantial period of years (four to six). There was no significant difference between the immunity levels of those who received three and those who received four injections of toxin-antitoxin. The authors conclude that no actively immunizing agent provides perfect protection against diphtheria. This is not surprising as the disease itself does not provide complete protection against subsequent attacks. Diphtheria affects predominantly poor white children. In the control of the disease, the improvement of living and housing conditions is important.

Atmospheric Lead from Colored Blackboard Crayons.—Ruf and Fluck state that the Wisconsin State Board of Health was recently requested to analyze two samples of yellow blackboard crayons suspected of containing lead. The analysis showed they contained respectively 7 and 8.8 per cent lead. Subsequent discussions with school officials disclosed that yellow

blackboard crayons were used extensively, especially in defective vision classes. The possibility of lead poisoning due to inhalation of lead dust during use of some of the colored crayons was investigated. Twenty-seven crayons obtained from six manufacturers were analyzed for their lead content. The crayons were obtained from various schools or school supply houses in Wisconsin without selection. In studies relative to the amount of crayon dust dispersed into the atmosphere under controlled and actual classroom conditions, atmospheric samples were collected at the breathing zone of the person writing and in the center of the room at a height corresponding to the breathing level of students. Data show that with use of 6.8 per cent lead crayons under controlled conditions, the concentration of lead in the air may at times exceed the 1.5 mg. of lead per ten cubic meters of air recommended by the United States Public Health Service as the maximal amount permissible for prolonged exposure. During a writing period of thirty minutes the amount of lead at the breathing zone of the person writing is dependent on the rate of crayon usage. During the writing period the lead was dispersed throughout the room air, but in all cases the concentration was below that at the blackboard. The maximal concentration of lead found in samples of air collected seventy minutes after writing ceased was 0.2 mg. per ten cubic meters of air. The results under classroom conditions agree with those of the controlled group in that ordinarily the concentration of lead in the air at the center of the room was below 1.5 mg. per ten cubic meters of air. However, under adverse conditions (when much crayon is being used or many students are writing) it seems reasonable to expect that higher concentrations of lead may occur. During one test, in which 13 Gm. of crayon was used in one hour's writing, the concentration of lead in the air at the blackboard was 5.9 mg. per ten cubic meters. Persons subjected to the greatest lead exposure are teachers and students writing at the boards and janitors cleaning boards, erasers and classrooms. As children appear more susceptible to lead intoxication than adults, the desirability of replacing lead chromate as a pigment is apparent. In addition to absorption of lead by inhalation, the danger of ingestion by nibbling pieces of crayon should not be ignored. The fact that at least one manufacturer has produced a yellow crayon free of lead shows that the hazard can be eliminated.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 321-480 (Sept.) 1939

- Use of Intestinal Intubation in Localization of Lesions of Gastrointestinal Tract. J. E. Lofstrom and R. J. Noer, Detroit.—p. 321.
- *Lymphosarcoma of Stomach: Diagnosis and Treatment. V. W. Archer and G. Cooper Jr., University, Va.—p. 332.
- Liposarcoma of Mediastinum and Lung. C. W. Perkins, Norwalk, Conn., and R. F. Bowers, New York.—p. 341.
- Compression of Spinal Cord in Osteitis Deformans (Paget's Disease) of Vertebrae. G. A. Schwarz, Hartford, Conn., and S. Reback, New York.—p. 345.
- Anomalies and Variations in Normal Skull: From Roentgenologic Point of View. C. W. Schwartz, New York.—p. 367.
- Medullary Artefacts in Prehistoric Bones. F. H. Decker and M. G. Bohrod, Peoria, Ill.—p. 374.
- *Roentgen Therapy in Lymphogranuloma Venereum. J. I. Martin and A. A. de Lorimier, Washington, D. C.—p. 376.
- Treatment of Mammary Cancer and Calculations of Dosages Delivered by Radiation Therapy. G. Beckstrand, Long Beach, Calif.—p. 389.
- Further Observations on Carcinoma of Breast. E. P. Pendergrass and P. J. Hodes, Philadelphia.—p. 393.
- Dental Lesions Observed After Roentgen Therapy in Cancer of Buccal Cavity, Pharynx and Larynx. J. A. del Regato, Washington, D. C.—p. 404.
- *Roentgen Treatment of Lobar Pneumonia. L. Solis-Cohen and S. Levine, Philadelphia.—p. 411.
- Roentgen Therapy of Cancer in Buccal Cavity and of Cervix Uteri. E. A. Merritt, Washington, D. C.—p. 418.

Lymphosarcoma of Stomach.—Archer and Cooper sent a questionnaire to all diplomates of the American Board of Radiology and asked that they cite all microscopically proved but heretofore unreported cases of these tumors. The information gleaned from this questionnaire reveals ninety-one cases and the authors add three of their own. In these ninety-four cases thirteen five year cures have been disclosed. In eight irradiation alone was used, in one only surgery and in four both surgery and irradiation. No single symptom or x-ray sign is pathognomonic of the growth, the diagnosis being practically impossible except possibly at operation, when a softer tumor than the usual carcinoma is felt. A frozen section will then be quite helpful. Enlarged rugae are not believed to play a

prominent part in x-ray diagnosis. Acid values may or may not be decreased. Healing of an ulcer does not eliminate the possibility of sarcoma.

Röntgen Therapy for Venereal Lymphogranuloma.—Martin and de Lorimier used roentgen therapy in sixty-one cases of venereal lymphogranuloma. Only one of the patients was a woman. In all but four the active processes concerned inguinal glands. In one of the four the involvement appeared primarily to have existed on the tongue and mucous membranes of the cheek and oral pharynx. The other three extragenital lesions were manifested by constrictions in the lower colon or rectum. Frei reactions were positive in forty-two of the patients. Twenty of these admitted that they had had some type of primary lesion and in most instances these were described as small ulcerations. The descriptions by the patient whose mouth and oral pharynx were involved indicated that herpetiform lesions had recurred at irregular intervals for about two years. The losses of roentgen radiation required varied. To avoid marked reactions the authors started treatment with as little as 50 roentgens. In cases showing little evidence of swelling or inflammation, 100 roentgens was given. When 50 or 100 roentgens was given, the interval between treatments was one week. When the dosage was increased to 200 roentgens the interval was increased to two weeks. Later, when 300 roentgens was applied the interval was increased to three weeks. In a few cases as much as 400 roentgens was given but the interval between treatment was never extended beyond three weeks. Roentgen irradiation was continued at intervals of from one to three weeks until the activity of the lesions subsided. Patients were not incapacitated for more than the first few weeks. Thereafter they were able to carry on their usual work. In approximately 60 per cent of the cases fistulous tracts developed either spontaneously or as a result of incisions made by the referring physician. In both instances, drainage stubbornly continued. The presence of the fistulous tracts seemed to add to the indications for roentgen therapy. The quality of roentgen rays varied somewhat. In attacking the inguinal adenitis a kilovoltage of 140 was used. The filtration was of the equivalence of 0.30 mm. of aluminum, the half-value layer being obtained with 0.30 mm. of copper—a wavelength equivalence of 0.205 angstrom. The four extragenital cases were treated with a shorter ray. The portals of irradiation were reduced to a minimum. All treatments were given with the use of a cone whereby the focal skin distance was 37 cm. Unfavorable developments occurred in only two of the fifty-seven cases involving the inguinal glands. There have been no known recurrences of activity among the patients. The authors believe that venereal lymphogranuloma should be considered in cases of inguinal adenopathy, especially when the involvement is predominantly unilateral and when there is matting and tenderness of the glands. The presence of an ulcer about the genitalia should not designate the case as one of syphilis or Ducrey infection, though the possibilities must be considered. The development of multiple fistulous tracts from lymphatic glands should lead one to consider venereal lymphogranuloma. Smears and cutaneous tests should be made, as well as repeated serologic examinations. The Kahn test was positive in eight of the sixty-one cases. This condition should also be considered in cases of stubborn chronic granulomatous lesions in the mouth or oral pharynx, especially if such cases manifest a marked regional lymphadenitis and a tendency toward persistent formation of fistulous tracts. It should be considered in cases of annular or bandlike constrictions in the colon or rectum. Irradiation must be applied at intervals, protracted over a period of from one to three months. The glands as well as the sinus tracts should be irradiated.

Röntgen Treatment of Lobar Pneumonia.—Solis-Cohen and Levine irradiated twenty lobar pneumonia patients and found that if adults were treated in the department before the fourth day of the onset of the disease they recovered without complications. Adults treated at the bedside required more frequent treatments, and many more complications developed. Adults treated after the fourth day either with high voltage or at the bedside had a more severe course. The favorable syndrome (decreased fever, a feeling of comfort and an initial fall in leukocytosis) was experienced by all patients who recovered but not by the patients who died. Four adults died, two of

whom were hopelessly ill prior to irradiation, and the corrected mortality is therefore 10 per cent. One of the twenty-two children irradiated died; bacteremia and a mastoiditis developed in this child. The course of the disease was more severe in children and adults who were not irradiated. In four irradiated adults the disease was practically aborted and crisis or lysis exhibited a tendency to occur earlier than in the nonirradiated patients. Oxygen tents were less often necessary for the irradiated patients. In the forty adults who received no irradiation, seven were treated with serum; two of these died, together with eight who did not receive serum. The death rate was 25 per cent. Fifteen of the recovered patients had a stormy course and there were major or minor complications in twenty of the series. Nine of the twenty adult patients received from 150 to 200 roentgens and eleven from 300 to 400 roentgens. Of the children, fifteen received from 200 to 300 roentgens and seven 150 roentgens. The death rate in the children given roentgen therapy was not influenced, as one of twenty-one nonirradiated children died; but the irradiated children were comfortable, complications did not develop and they passed through a less stormy course.

American Journal of Tropical Medicine, Baltimore

- 19: 425-496 (Sept.) 1939
Malaria Survey of Republic of Costa Rica, Central America. H. W. Kumm, San Jose, Costa Rica, and H. Ruiz S.—p. 425.
Malaria Mortality in the Southern United States for the Year 1937: Prepared for National Malaria Committee. E. C. Faust, New Orleans.—p. 447.
Anopheles Mattogrossensis from Venezuela with Description of the Male. A. Gabaldon, Caracas, Venezuela.—p. 457.
Varieties of Anopheles Crucians Wied. W. V. King, Washington, D. C.—p. 461.
Clinical Trichocephalus Trichiurus Infection: Analysis of Eighty-One Cases. J. C. Swartzwelder, New Orleans.—p. 473.
Enrichment of Culture Mediums for Endamoeba Histolytica. Gladys M. Craig, New York.—p. 483.

Annals of Surgery, Philadelphia

- 110: 481-800 (Oct.) 1939. Partial Index
Experiences with Total and Intracapsular Extirpation of Acoustic Neuromas. G. Horrax and J. L. Poppen, Boston.—p. 513.
Intracranial Arteriovenous Aneurysms. A. O. Singleton, Galveston, Texas.—p. 525.
Bowel Obstruction in the Newborn. E. M. Miller, Chicago.—p. 587.
Peptic Ulcers Perforating into Pancreas. J. S. Horsley, Richmond, Va.—p. 606.
Lateral Gastroduodenostomy in Certain Cases of Duodenal and Recurring Ulcer. V. C. Hunt, Los Angeles.—p. 622.
*Experimental Proof of Obstructive Origin of Appendicitis in Man. O. H. Wangersteen and C. Dennis, Minneapolis.—p. 629.
Value of Preliminary Colostomy in Correction of Gastrojejunalocolic Fistula. D. B. Pfeiffer, Philadelphia; assisted by E. M. Kent, Norwich, Conn.—p. 659.
Sclerosing or Retractable Mesenteritis: Its Treatment and That of Adhesions with Electrosurgical Knife. F. L. Reichert, F. Gerbode and F. J. Halford, San Francisco.—p. 669.
*Liver Trauma and Hepatorenal Syndrome. T. G. Orr and F. C. Helwig, Kansas City, Kan.—p. 682.
Control of Postoperative Bleeding in Obstructive Jaundice. J. D. Stewart, G. M. Rourke and A. W. Allen, Boston.—p. 693.
*Significance of Cholesterol Partition of Blood Serum in Surgery of Gallbladder. O. C. Pickhardt, A. Bernhard and I. L. Kohn, New York.—p. 701.
Fibroma of Ovary with Ascites and Hydrothorax: Further Report. J. V. Meigs, Boston.—p. 731.
Effect of Distention of Colon and Stimulation of Its Nerve Supply on Flow of Bile from Liver. L. Goldman and A. C. Ivy, Chicago.—p. 755.

Obstructive Origin of Appendicitis.—Wangersteen and Dennis present evidence of the secretory capacity of the vermiform appendix of man. The behavior of the appendix when obstructed temporarily is described, and factual proof of the reproduction of the pathologic picture of spontaneous appendicitis through the agency of obstruction is presented. In a patient presenting a carcinoma of the ascending colon, it was possible to exteriorize the greater portion of the right half of the colon and the terminal ileum. A few days later, when the exteriorized intestine had become fairly well covered with fibrin and effectual sealing of the wound had occurred, the base of the appendix was ligated securely. The attachment of a closed water system connected to a recording manometer permitted determination of the ensuing increase in intraluminal pressure. When preliminary colostomy was being performed for a malignant condition of the large intestine or rectum prior to excision of the lesion, the appendix was exteriorized and obstructed. The

secretory activity of the obstructed appendixes is summarized. The highest recorded pressure was 126 cm. of water. This level was reached twenty-two hours after exteriorization and obstruction of the appendix of a man 68 years of age. No secretory pressure developed in three of the twenty-two exteriorized obstructed appendixes. In six other instances a secretory pressure of less than 20 cm. of water was recorded. In nine instances the highest secretory pressure exceeded 40 cm. of water; in seven of these the pressure was sustained above 85 cm. In four instances, pressures intermediate between 20 and 40 cm. of water attended obstruction of the exteriorized appendix. These data the authors believe support the thesis that in the vermiform appendix of man, when obstructed, a secretory pressure will develop in the majority of instances which will threaten the viability of the appendical wall. However, there are instances in which no evidence of secretory pressure attends luminal obstruction. Such appendixes undoubtedly would tolerate luminal obstruction without hazard. It appears likely that the chief inciting agency in bringing about appendicitis in man is obstruction of an appendix in which the mucosa (not atrophic) possesses the normal secretory capacity.

Liver Trauma and Hepatorenal Syndrome.—Orr and Helwig report five cases of hepatic injury associated with renal damage in all of which some degree of a toxic effect on the kidneys was shown by an increase in the blood of nonprotein nitrogen and creatinine and in the urine of albumin, pus and casts. In two cases there was postmortem examination. The changes in the blood and urine occur rapidly after severe hepatic injury. In less than twenty-four hours there was retention of nitrogen, and albumin, casts and frequently pus and erythrocytes were present in the urine. Helwig and Schutz observed these rapid changes in the blood and urine of dogs dying within twelve hours after the liver was traumatized. It is difficult to believe that infection is a factor in the hepatic and renal changes. The three patients operated on all had infected wounds, but the changes in the blood and urine were present before the infection developed. In case 2, general peritonitis was found at necropsy but the blood chemistry had returned to normal before death. It is believed that in this patient death was not directly due to the toxic effect of the hepatic trauma but was caused by the complicating infection. In case 1, the blood returned to normal although a severely infected wound and later an empyema developed, from which the patient recovered. Krieg has presented evidence which pointed to a toxic condition on an uninfected basis. From the clinician's standpoint the practical value of the observations on blood and urine incident to hepatic trauma are worthy of consideration. Although the nitrogen retention in the blood develops early after hepatic damage, the importance of early operation to control hemorrhage would negate the value of the changes in the blood and urine as a diagnostic aid in many cases. However, in those cases in which bleeding is slow and the condition of the patient warrants a delay of a few hours to establish the diagnosis of hepatic injury, the changes in the blood and urine may be of some diagnostic value. In case 2, operation was delayed for twenty-four hours, during which time the nonprotein nitrogen rose to 131 mg. and the creatinine to 4.1 per hundred cubic centimeters of blood. This patient had other injuries complicating the picture, but knowing that such blood changes are associated with hepatic damage aided in confirming the diagnosis of rupture of this organ. Frequent estimations of the nonprotein nitrogen and creatinine may be of definite value in the prognosis. Certainly an increase in nitrogen retention indicates an increase in toxicity. Delirium may be an outstanding symptom; it was observed in four of the cases reported. After a few days there develops a hemorrhagic tendency, similar to that observed in patients with jaundice. The treatment of severe hepatic trauma is the treatment of shock plus operation to control bleeding and administration of dextrose to maintain liver glycogen and promote diuresis. The quantity of sodium chloride given must depend to some extent on the quantity lost by vomiting. Usually the administration of chlorides is not an important factor in treatment.

Blood Cholesterol and Gallbladder Operations.—Pickhardt and his co-workers state that in normal persons the ratio of esterified to free cholesterol is a physiologic constant. Any alteration in this relationship indicates a disturbance in the ability of the liver to regulate the synthesis and hydrolysis of

cholesterol esters. They believe that the liver has a functional reserve, which is reflected by changes in the cholesterol partition. A rise in the percentage of free cholesterol of the blood serum is indicative of a lowering of the functional reserve. They show that changes in the cholesterol partition are of clinical value in determining the functional reserve of the liver in hepatic disturbances associated with surgical therapy of the biliary tract and thus serve to indicate the optimal time for a planned surgical intervention. A patient who exhibits a low functional reserve of the liver is a poor operative risk. Medical treatment should be instituted, and repeated estimations of the cholesterol partition will indicate when the functional reserve has returned to normal. The cholesterol partition has prognostic value in surgical treatment of the gallbladder and biliary tract. The cholesterol partition of the blood serum should be determined both preoperatively and postoperatively for all patients with biliary disease and jaundice.

Archives of Internal Medicine, Chicago

64: 661-896 (Oct.) 1939

- Reflex Coronary Artery Spasm Following Sudden Occlusion of Other Coronary Branches. G. W. Manning, C. G. McEachern and G. E. Hall, Toronto.—p. 661.
- *Angina Pectoris in Hereditary Xanthomatosis. C. Müller, Ullevaal, Norway.—p. 675.
- Chronic Leukemia: Early Phase of Chronic Leukemia, Results of Treatment and Effects of Complicating Infections: Study of Eighty-Six Adults. M. M. Wintrobe and L. L. Hasenbush, Baltimore.—p. 701.
- Traumatic Rupture of Pericardium: Study of Twenty-Two Cases, with Two and One-Half Year Period of Survival in One Case: Review of Literature. S. F. Crynes and W. C. Hunter, Portland, Ore.—p. 719.
- Experimental Renal Insufficiency Produced by Partial Nephrectomy: XIII. Summary of Effect of Whole Liver, Whole Meat, Extracted Liver and Extracted Meat Diets on Renal Hypertrophy, Renal Function, Blood Pressure and Cardiac Hypertrophy. A. Chauvut and S. Ludewig, University, Va.—p. 747.
- Id. XIV. Diets Containing Whole Dried Yeast. A. Chauvut and S. Ludewig, University, Va.—p. 756.
- Age, Sex and Hypertension in Myocardial Infarction Due to Coronary Occlusion. A. M. Master, S. Daek and H. L. Jaffe, New York.—p. 767.
- Juvenile Diabetes Mellitus. W. H. Grishaw, H. F. West and D. Smith, Los Angeles.—p. 787.
- Hyperthermia, Genuine and Spurious. W. J. MacNeal, New York.—p. 800.
- Prolonged Hyperthermia: Report of Case with Necropsy. W. J. MacNeal, H. H. Ritter and S. M. Rabson, New York.—p. 809.
- Multiple Myeloma Associated with Nodular Deposits of Amyloid in Muscles and Joints and with Bence Jones Proteinuria. L. Tarr and H. W. Ferris, New York.—p. 820.
- Gastro-Enterology: Review of Literature from July 1938 to July 1939. C. M. Jones, Boston.—p. 834.

Angina Pectoris in Hereditary Xanthomatosis.—Hereditary heart disease due to xanthomatosis is fairly common. Müller believes that he has demonstrated it as a dominant factor in seventeen families, with seventy-six individuals affected. He divides the affected persons into three familial groups: the families in which xanthoma tuberosum and eventually palpebral xanthelasma occurred; the families with palpebral xanthelasma, and the families in which there were no changes in the skin or subcutaneous tissue but in which the cardiovascular disease occurred in combination with hypercholesterolemia and in which postmortem observations or other factors suggested that xanthomatosis might be the main cause of the cardiovascular disease. The group consists of forty-four women and thirty-two men from 31 to 85 years of age, the average for the living members being 56.3 and for the deceased ones 60.9 years. Most of these persons were office workers or teachers. The laboring class was not represented. Of the seventy-six persons, sixty-eight appeared to have had heart disease, while eight had xanthelasma only. Of the sixty-eight persons, the diagnosis of angina pectoris seemed indicated in fifty-nine, of whom thirty-eight have died, fourteen suddenly. Of the seventeen family histories, in eight xanthoma tuberosum was encountered alone or combined with xanthelasma, in six there were records of xanthelasma only and in three there were no records of cutaneous changes. Cutaneous xanthomatosis in one form or another occurred in thirty-eight persons, xanthoma tuberosum in twenty-four and xanthelasma in fourteen; ten had the two forms at the same time. The quantity of cholesterol in the blood was estimated for thirty-seven patients; the amount varied from 129 to 560 mg. per hundred cubic centimeters. The reports presented confirm the previous observations on xanthomatosis as a cause of heredi-

tary heart disease. They reveal further that the syndrome of cutaneous xanthomatosis, hypercholesteremia and angina pectoris presents itself as a well defined clinical disease entity in the first, second, third and fourth generations, that is, as a dominant hereditary disease. There can be hardly any doubt but that xanthomatous deposits in the coronary artery and consecutive myocardial ischemia are the cause of the angina pectoris. The disease may cause changes in the mitral and aortic valves. The form of angina pectoris under discussion may occur in patients without external xanthomatosis. Data on two families illustrate that xanthomatosis may occur in a few members or only one member of a family, while relatives have heart disease and hypercholesteremia. In xanthomatosis, angina pectoris not only may occur at an early age with sudden death but more often appears as typical angina pectoris, lasting for years in middle-aged as well as in old persons; that is, it appears at the time that this disease usually occurs, from the sixtieth to the seventieth year or even later. In sixteen cases in the present series it commenced before the fiftieth year and in eight of these between the thirty-first and the fortieth year. Symptomatically this form of angina pectoris does not differ from the usual form. Xanthomatous cardiac lesions probably develop in persons who have no evidence of xanthomatosis in the skin. Xanthoma tuberosum and xanthelasma may be overlooked in clinical examinations and may be confused with other cutaneous conditions. The occurrence of heart disease in families should direct the attention to xanthomatosis, especially when rheumatic fever, syphilis and hypertension do not appear to play any part. Treatment of the cardiac symptoms in xanthomatosis does not differ from that of cardiac symptoms under other conditions. The patients are benefited by quiet, rest in bed and nitrites. A diet poor in cholesterol may be of prophylactic value to persons with a hereditary predisposition.

Archives of Otolaryngology, Chicago

30: 497-688 (Oct.) 1939

- Surgical Treatment of Deafness. W. Hughson, Abington, Pa.—p. 497.
Further Experiments in Action of Drugs on Nasal Mucosa. A. W. Proetz, St. Louis.—p. 509.
Blood Cultures in Cases of Otitic Sepsis. J. L. Goldman, New York.—p. 516.
Hay Fever Among Japanese: III. Studies of Atmospheric Pollen in Tokyo and in Kobe. H. J. Hara, Los Angeles.—p. 525.
Vertigo: Clinical Consideration. B. H. Shuster, Philadelphia.—p. 536.
*Climatic Factor in Mastoiditis. N. D. Fabricant, Chicago.—p. 549.
*Experiences with Sulfanilamide Therapy for Otogenous Infections, with Special Reference to Masking of Clinical Course. J. L. Maybaum, E. R. Snyder and L. L. Coleman, New York.—p. 557.
Origin of Quick Component of Labyrinthine Nystagmus. E. A. Spiegel, Philadelphia, and J. B. Price, Norristown, Pa.—p. 576.
Headache from Pathologic Changes in Nose or Other Causes: Differential Diagnosis. T. R. Gittins, Sioux City, Iowa.—p. 589.
Importance of Vestibular Findings Following Injury to Head. M. A. Zacks, Philadelphia.—p. 601.
Carcinoma of Trachea. A. M. Olsen, Rochester, Minn.—p. 615.
Paranasal Sinuses: Malignant Tumors. S. Salinger, Chicago.—p. 633.

Climatic Factor in Mastoiditis.—During 1938, ninety-two mastoidectomies were performed on children by the attending otologic staff of a pediatric hospital. Fabricant selected five cases from this group to illustrate the influence on the clinical course of the ailment of daily meteorologic and seasonal changes. Simplified meteorographs have been prepared from the United States government meteorologic data; for purposes of simplification the high and low range of daily temperature were regarded as an adequate index of meteorologic change. From the data obtained Fabricant concludes that mastoiditis is most often precipitated in the wake of a fall in atmospheric temperature (cold front or polar front), when the functional status of the mucous membranes of the nose and throat has changed.

Sulfanilamide Therapy for Otogenous Infections.—Because of its tendency to obscure the clinical course of the infection, Maybaum and his associates believe that sulfanilamide should be used cautiously if at all in acute otitis media. It is contraindicated during the course of suspected mastoiditis before operation and also after operation unless meningitis, sinus thrombosis or cerebral abscess complicates the disease. For the present, at least, they believe that the indications for its use are as follows: Sulfanilamide may be given in otitis media before suppuration sets in. However, otitis media of

this type commonly proceeds to spontaneous resolution. Occasionally, in cases of extreme bacterial meningitis (streptococci or pneumococci), intensive administration is indicated before operation (twenty-four to thirty-six hours) and then postoperatively. Sulfanilamide should be given in sympathetic meningitis secondary to an extradural abscess, an abscess of the brain or labyrinthitis. In thrombosis of the lateral sinus sulfanilamide should be followed by thorough surgical intervention and continued postoperatively. The drug is especially useful in instances of continued otitic sepsis, even though a thorough operative procedure has been previously performed. In petrositis sulfanilamide should not be administered during the period of observation because of the danger of masking the clinical course and thus interfering with the proper management of the condition. If operation is indicated sulfanilamide should be given promptly in the usual manner. Indiscriminate use of sulfanilamide may result in latent forms of infection of the middle ear or the mastoid and their complications. That sulfanilamide tends to mask the clinical picture of otitic infection has been observed often. A striking example of latency due to the administration of sulfanilamide was recently reported by Smith and Coon, who stated that a moderate dose of sulfanilamide may partially control meningitis so that it presents an unfamiliar clinical picture.

Bulletin New York Academy of Medicine, New York

15: 639-716 (Oct.) 1939

- Proteins as Chemical Substances and as Biologic Components. E. J. Cohn, Boston.—p. 639.
Origin and Developmental Potentialities of Blood Cells. C. A. Doan, Columbus, Ohio.—p. 668.
Curious Career of Typhoid Mary. G. A. Soper, New York.—p. 698.

Connecticut State Medical Society Journal, Hartford

3: 541-590 (Oct.) 1939

- Valedictory. C. Barker, New Haven.—p. 541.
*Use of Insulin in Toxic Hallucinoses. H. W. McAdoo and C. T. Prout, Arlington, Mass.—p. 543.
Scoliosis: Rational Form of Treatment. C. W. Goff, Hartford.—p. 549.
Herniation of Intervertebral Disks. R. D. Padula, Norwalk, and R. C. Keys, Bridgeport.—p. 552.
Blood Transfusions: New Apparatus for Their Administration. J. H. Fine and R. M. Tovell, Hartford.—p. 560.

Insulin for Toxic Hallucinoses.—On the basis of Sakel's explanation for the use of insulin in the treatment of morphine addiction, that is, "that insulin abolishes the phenomena of irritation during abstinence from morphine, because the nerve cells were blocked, and their function quantitatively affected," McAdoo and Prout began using insulin in eight cases of alcoholism associated with abnormal mental phenomena, particularly with hallucinoses. The subjects were selected from the consecutively admitted patients who presented evidence of hallucinatory phenomena of persistent nature which followed overindulgence in alcohol or which made their appearance after the withdrawal of alcohol. The hallucinations were, in most cases, both auditory and visual. The size of the dose of insulin varied from a minimum of 10 to a maximum of 25 units. The reaction (hypoglycemia) to dosage has been found to be extremely variable. A nursing personnel trained in the observation of patients receiving insulin therapy is absolutely essential. The repetition of dosage has been largely dependent on the needs of the individual, with a maximal frequency of every two and three-fourths hours. The largest number of treatments required was eleven, for a total dosage of 95 units, although 135 units were given in a smaller number of doses to another patient. The treatment was most satisfactory when it was continued for at least twenty-four hours after the hallucinations disappeared. The effect of the injections was largely sedative, with definitely and progressively decreasing evidence of severity in the reaction of the patient to the hallucinations. The most striking observation is that during the hospital residence the average total duration of the hallucinations in the treated series (143.6 hours) is definitely less than that in the untreated series (306 hours). On subtracting the average number of hours of active hallucinoses in the hospital prior to treatment with insulin from the total hours of hallucinoses in the hospital in the untreated series a still greater and even more striking contrast is obtained. The average figure for continued hallucinations following the institution of insulin therapy in the treated series was 50.4 hours,

as compared with 115 hours in Piker and Cohn's series of cases in which they used spinal puncture, dextrose and paraldehyde, and with 79.2 hours for untreated patients and 31.2 hospital hours for patients treated with insulin cited by Robinson.

Indiana State Medical Assn. Journal, Indianapolis

32: 557-598 (Oct.) 1939

- Tuberculosis Outlook. P. H. Becker, Crown Point.—p. 557.
 *Tuberculosis After 45 in Indiana. F. L. Jennings, Indianapolis.—p. 559.
 Classification of Hypertension. I. H. Page, Indianapolis.—p. 562.
 Subacute Bacterial Endocarditis Presenting Some Surgical Considerations: Case. J. R. Phillips, Michigan City.—p. 563.
 Diagnosis and Results of Treatment of Toxic Goiter. N. W. Gillette, Toledo, Ohio.—p. 565.
 Cesarean Operation in Relation to Maternal Mortality. G. B. Jackson, Indianapolis.—p. 570.
 Cesarean Section: Analysis of 127 Consecutive Cases. L. W. Elston and R. W. Elston, Fort Wayne.—p. 572.

Tuberculosis After 45 in Indiana.—According to Jennings, a general impression held by the medical profession and the laity is that tuberculosis among older people is almost non-existent. While it is true that a greater number of persons less than 45 years of age die of tuberculosis the difference is not so great that this erroneous idea is justified. Although there has been a definite decrease in the total number of deaths from tuberculosis in persons more than 45 years of age, further analysis of these figures shows that the proportion in this age group when considered in relation to the total number of deaths for all ages has not decreased; in fact, there has been a slight increase. In the state of Indiana there has been a gradual increase in this percentage. In 1938, 45.2 per cent of all the tuberculosis deaths in the state occurred in persons in this age group. In 1933 and again in 1938, 50 per cent of all the male tuberculosis deaths occurred in men 45 or more years of age. The percentage increase in deaths due to tuberculosis has exceeded the percentage increase in population of persons more than 45 years of age. Persons in this age group undoubtedly act as potential spreaders of the tubercle bacilli.

Iowa State Medical Society Journal, Des Moines

29: 479-536 (Oct.) 1939

- Some of the Problems Confronting the Medical Profession. I. Abell, Louisville.—p. 479.
 Hypersensitivity as Factor in Chronic Monilia Vaginitis. R. E. Trussell, Iowa City.—p. 485.
 Improved Method of Indirect Blood Transfusion. D. C. Sharpe, Dubuque.—p. 489.
 Hydronephrosis Resulting from Ureteropelvic Obstruction. L. E. Pierson and E. M. Honke, Sioux City.—p. 491.
 Treatment of Fractures of Spine. H. R. Conn, Akron, Ohio.—p. 495.
 Patellaplasty: Partial Excision of Patella. L. J. Miltner, Davenport.—p. 502.
 Nerve Deafness. J. A. Downing, Des Moines.—p. 503.

Johns Hopkins Hospital Bulletin, Baltimore

65: 291-352 (Oct.) 1939

- Differentiation of Myeloblasts from Lymphoblasts by Their Manner of Locomotion: Motion Picture Study of Cells of Normal Bone Marrow and Lymph Nodes, and of Leukemic Blood. A. R. Rich, M. M. Wintrobe, Baltimore, and Margaret R. Lewis, Washington, D. C.—p. 291.
 Activity of Lymphocyte in Body's Reaction to Foreign Protein, as Established by Identification of Acute Splenic Tumor Cell. A. R. Rich, Baltimore; Margaret R. Lewis, Washington, D. C., and M. M. Wintrobe, Baltimore.—p. 311.
 *Transient Paralysis from Postural Hypotension. H. M. Thomas Jr., Baltimore.—p. 329.
 Note on Reactions of Mouse Uterus to Ovariectomy in Presence of X Zone. Evelyn Howard, Baltimore.—p. 341.

Transient Paralysis from Postural Hypotension.—Thomas reports the case of a 65 year old man who has had innumerable attacks of transient paralysis of the right arm and leg and occasional blurring of vision of the left eye. These symptoms were reproduced by raising the patient on a tilting table from the flat to a 75 degree erect posture, at which time his blood pressure fell momentarily from 130 mm. of mercury systolic and 88 diastolic to 82 systolic and 55 diastolic or even lower. The paralysis passed in five or ten minutes with absolutely no residuum. The author believes that this apoplexy is caused by a fleeting localized cerebral ischemia which occurs in the course of a decrease in blood pressure from postural hypotension. The degree of narrowing of the lumen from arteriosclerosis of the various cerebral vessels determines the point at which the ischemia first produces symptoms. So sudden

is the paralysis in the leg that the patient falls to the ground if he is not clinging to a chair or some other object for support. Stimulation of a hypersensitive carotid sinus may cause a sudden lowering of the blood pressure, but it is suggested that in this patient the postural hypotension is associated with an insensitve reflex pressor mechanism rather than with a hypersensitive reflex depressor mechanism. The occurrence of transient dimness of vision in one eye may be explained by the calcified bodies observed in a roentgenogram of the region of the internal carotid artery, which strongly suggest advanced sclerosis of this vessel. The physiologic explanation has served in this case as a basis for treatment. Treatment designed to prevent excessive drops in blood pressure has greatly diminished the number and severity of the attacks.

Journal-Lancet, Minneapolis

59: 419-470 (Oct.) 1939

- Maternal Care: Introduction. F. L. Adair, Chicago.—p. 419.
 Maternal Mortality in North Dakota. J. H. Moore, Grand Forks, N. D.—p. 420.
 Postgraduate Education in North Dakota. J. L. Conrad, Jamestown, N. D.—p. 427.
 Toxemias of Late Pregnancy. N. R. Kretschmar, Ann Arbor, Mich.—p. 428.
 Child and Maternal Health Program in South Dakota. M. W. Pangburn, Miller, S. D.—p. 432.
 Prophylaxis of Puerperal Sepsis. R. D. Reekie, Spokane, Wash.—p. 434.
 Maternal and Infant Mortality in Montana. F. L. McPhail, Great Falls, Mont.—p. 438.
 Third Trimester Bleeding. G. A. Carmichael, Butte, Mont.—p. 441.
 Care of the Healthy Baby. E. A. Hagmann, Billings, Mont.—p. 445.
 Injuries to the Newborn. L. R. Alderson, Missoula, Mont.—p. 449.
 Use of Elimination Diets in Allergy of Childhood. A. V. Stoesser and Eileen Hanson, Minneapolis.—p. 452.
 Human Serum and Specific Agents in Treatment of Acute Meningitis. W. S. Sako, E. C. Perlman and E. S. Platou, Minneapolis.—p. 457.

Journal of Nervous and Mental Disease, New York

90: 429-568 (Oct.) 1939

- Progressive Interstitial Hypertrophic Neuritis. P. Sloane, Philadelphia.—p. 429.
 Metrazol Seizure and Its Significance for Pathophysiology of Epileptic Attack. H. Strauss, C. Landis and W. A. Hunt, New York.—p. 439.
 Hysterical Amnesia Relieved by Induced Convulsions: Case Report. G. S. Ingalls, Cincinnati.—p. 453.
 Significance of Infantile Sucking for Psychic Development of Individual. Margaret A. Ribble, New York.—p. 455.
 Blood Lipids in Dementia Praecox and During Insulin Shock Therapy. M. Gerundo and W. W. Corwin, Topeka, Kan.—p. 464.
 Genesis of Case of Paranoid Dementia Praecox. C. Brenner, Boston.—p. 483.
 Convulsive Therapy in Psychoses. R. S. Bookhammer and E. Saxe, Norristown, Pa.—p. 489.

Journal of Pediatrics, St. Louis

15: 317-468 (Sept.) 1939

- Malignant Tumors in Childhood. H. W. Dargeon, New York.—p. 317.
 Malignant Tumors of Bone in Children. B. L. Colcy, New York, and R. L. Peterson, Coeur d'Alene, Idaho.—p. 327.
 Lymphomas, Leukemias and Allied Disorders in Children. L. F. Craver, New York.—p. 332.
 Cancers of Genito-Urinary Organs in Children. A. L. Dean, New York.—p. 340.
 Gynecologic Cancer in Children. J. A. Kelly, New York.—p. 354.
 Cancer of Head and Neck in Children. H. E. Martin, New York.—p. 363.
 Tumors of Soft Somatic Tissues in Infancy and Childhood. G. T. Pack and T. J. Anglem, New York.—p. 372.
 Blood and Lymph Vessel Tumors in Children. W. L. Watson, New York.—p. 401.
 *Acute Appendicitis in Childhood: Statistical Study of 848 Cases from the Children's Hospital, Boston. H. W. Hudson Jr. and J. W. Chamberlain, Boston.—p. 408.

Acute Appendicitis in Childhood.—Hudson and Chamberlain studied the clinical records of the 848 patients with acute appendicitis and its complications admitted to the Children's Hospital, Boston, between Jan. 1, 1929, and Dec. 31, 1938. Records of incidental appendectomy, interval operations for chronic and recurrent appendicitis, exploration for ill defined abdominal pain and diagnostic errors are not included. The different types of acute appendicitis studied were characterized by unruptured appendix without fluid (323 cases), unruptured with fluid (143 cases), ruptured with local peritonitis (149 cases), ruptured with abscess (155 cases), ruptured with diffuse or spreading peritonitis (sixty-eight cases) and an appendix which the surgeon described as showing no gross evidence of acute inflammation but which on microscopic examination was

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New Jersey Medical Society Journal, Trenton

36: 569-632 (Oct.) 1939

- Selection of Cases of Peptic Ulcer for Surgery. H. S. Read, Atlantic City.—p. 573.
Macrocytic Anemia. S. J. Penchansky, Bayonne.—p. 577.
Cardiac Pain. F. A. Alling, Newark.—p. 581.
Infant Feeding. R. E. Wright, East Orange.—p. 586.
Criteria of Tuberculous Activity in Children Having Positive Tuberculin Test. E. H. Nickman, Atlantic City.—p. 587.
*Standards of Immunization Against Diphtheria. L. C. Rosenberg, Newark.—p. 591.
*Common Colds. Y. Kneeland Jr., New York.—p. 595.
*Glucose Tolerance Test in Recurrent Infectious Intertrigo. C. C. Carpenter, Summit.—p. 597.
Functional Disorders of Colon. S. W. Johnsen, Passaic.—p. 599.
Experiences in Diagnosis with Peritoneoscope: Indications for Its Use. C. A. Beling, Newark.—p. 602.
Cord Lesions in Pernicious Anemia. A. F. Dowd, Newark.—p. 605.

Standards of Immunization Against Diphtheria.—This report, Rosenberg explains, expresses the conclusions of the Committee on Child Health regarding a standard uniform method which a family doctor can follow in immunizing children against diphtheria. Health officials advocate immunization of children at about 9 months of age, followed by Schick retesting on their entering school, and the administration of another cycle of immunizing injections to children who have lost their immunity. This is probably the most logical plan. This procedure would be similar to that adopted in various European countries in infancy and a second on entering school. While the last word on the subject has not yet been written, the following procedure, in the opinion of various health officers, is recommended: to use the plain toxoid as the material of choice; to give a minimum of two injections, although three are preferable; to begin the injections at about the age of 9 months; to check this immunity four months later by a Schick test; to retest the children on entering school as to the persistence of their immunity, and to reinoculate the children found to have lost their protection.

Dextrose Tolerance Test in Recurrent Infectious Intertrigo.—Carpenter suggests that the carbohydrate metabolism should be determined in any person who has a chronic relapsing form of intertrigo so that if there is any defect it will be known. A simple test for blood sugar is not sufficient, for it may be within normal bounds. Campbell, in studying sugar metabolism of patients with pruritus, outlined a form of dextrose tolerance test which would indicate an abnormally delayed assimilation of carbohydrates. He gave orally 100 Gm. of dextrose on an empty stomach, and then took blood sugar readings one-half, one, two and two and a half hours after its administration. If the average result of these tests is more than 120 mg. per hundred cubic centimeters, he considers that an abnormal delay is present and that carbohydrate dietary restrictions should be enforced. In addition, in a few selected cases insulin may be necessary, in low dosages, until the acute manifestations are under control. No rational plan can be laid out for local treatment, but persistence and patience are indispensable.

New York State Journal of Medicine, New York

39: 1817-1898 (Oct. 1) 1939

- Role of Posture in Chronic Arthritis. H. H. Jordan, New York.—p. 1823.
Reduce Head Injury Mortality. F. W. Geib, Rochester.—p. 1832.
Can Syphilis Exist Apart from Sex? E. H. Hudson, Clifton Springs.—p. 1840.
Treatment of Colonic Diverticulitis. T. E. Jones, Cleveland.—p. 1846.
Discussion of Some Bronchoscopic Problems. H. E. Bozcr, Buffalo.—p. 1852.
Wilms' Tumor: Report of Case. J. H. Sheldon and J. W. Canaday, Glens Falls.—p. 1857.
Problem of Anemia: Some General Considerations. E. G. Allen, Syracuse.—p. 1861.
Coarctation of Aorta. D. W. Ingham, Washington, D. C.—p. 1865.
Value and Use of Urinary Antiseptics. F. J. Parmenter, Buffalo.—p. 1871.
*Bulgarian Belladonna Treatment of Chronic Encephalitis: Preliminary Report. Josephine B. Neal, New York.—p. 1875.
Bracelet Dermatitis. O. L. Levin and H. T. Behrman, New York.—p. 1877.

Bulgarian Belladonna for Chronic Encephalitis.—Neal used a white wine extract of the root of Bulgarian belladonna or tablets prepared from this extract in the treatment of seventy-five patients with chronic encephalitis; in most instances they

found to be acutely inflamed (nine cases). The correlation of appendicitis with infections of the respiratory tract was attempted but was not demonstrated. Oxyuris vermicularis infestation as a cause of acute inflammation was infrequent, but there appeared to be a clinical syndrome indistinguishable, with safety, from appendicitis produced by such infestation. There was no definite evidence that fecaliths initiate acute appendical inflammations. The symptoms, signs and changes in the peripheral blood were sufficiently consistent to make diagnosis before perforation possible even in the very young. The triad of abdominal pain, vomiting and slight fever must be considered presumptive evidence of acute appendicitis, and frequent, gentle and painstaking examinations should be made during the first twelve hours of illness to corroborate or disprove such a diagnosis. The general policy, with but few exceptions, has been immediate operation irrespective of the type of appendicitis. Operation was delayed only when parenteral fluids were indicated. Primary appendectomy was performed in 95 per cent of the cases. A rectus-retracting or muscle-splitting incision was generally used. A drain or drains were introduced in the presence of peritonitis and often in the presence of fluid not definitely purulent. Duodenal drainage, parenteral administration of fluid and morphine were used liberally. A high oxygen atmosphere was maintained in the presence of distention. Fowler's position and the application of heat to the abdominal wall were employed in the majority of cases. The mortality rate was 3.06 per cent (twenty-six deaths in 848 cases). The authors believe that the factors affecting the mortality rate were, in the order of their importance, (1) the type of appendicitis present at the time of admission, which in turn is governed by the duration of the attack before diagnosis and the age of the patient, (2) the treatment employed, (3) coexistent disease and (4) the age of the patient. There need be no inherently high mortality rate based on age alone provided that a diagnosis is made comparatively early and the young patient is treated wisely. Figures are presented which demonstrate the continued need for lay education and, to a lesser extent, for reemphasizing the problem to the medical profession.

Laryngoscope, St. Louis

49: 739-876 (Sept.) 1939

- Otogenic Complications: Résumé and Discussion of Literature for 1938. L. G. Richards, Boston.—p. 739.
Progress of Deafness in Clinical Otosclerosis. C. C. Bunch, St. Louis.—p. 793.
Frequency of Increased Nystagmus Time After Rotation in Multiple Sclerosis. P. Northington, New York.—p. 810.
Survey of Use of Sulfanilamide in Acute Otitis Media. K. M. Houser, Philadelphia.—p. 825.
Skull Fractures Involving the Ear: Clinical Study of 211 Cases. W. E. Grove, Milwaukee.—p. 833.
Report of the Chicago Committee on Otogenic Meningitis, 1939. A. Lewy, Chicago.—p. 871.

Maine Medical Association Journal, Portland

30: 247-278 (Oct.) 1939

- Small Community Hospital as a Teaching Hospital. J. T. Morrison, New York.—p. 247.
Bleeding During Pregnancy. C. P. Sheldon, Boston.—p. 254.
Endometriosis of Vagina: Case Report. W. F. W. Hay, Portland.—p. 260.
Diabetes Innocens. E. R. Blaisdell, Portland.—p. 264.

Missouri State Medical Assn. Journal, St. Louis

36: 383-426 (Oct.) 1939

- Combined Use of Typhoid Vaccine and Neoprontosil in Treatment of Gonococcal Arthritis. R. O. Muether and K. R. Andrews, St. Louis.—p. 383.
Acute Putrid Lung Abscess. L. H. Pollock, Kansas City.—p. 387.
Relation of Urinary Tract to Obscure Abdominal Symptoms. K. D. Dietrich, Columbia.—p. 393.
Physiologic Actions Producing Common Clinical Symptoms of Hypothyroidism. V. H. Bergmann, Kansas City.—p. 399.
Improved Treatment of Cervicitis by Copper Ionization. J. J. Bredall, Perryville.—p. 403.
Role of Ellis Fischel State Cancer Hospital in Control of Cancer. F. J. Taussig, St. Louis.—p. 407.
Incidence and Mortality of Acute Poisonings. V. E. Friedewald, St. Louis.—p. 411.
Trochanteric Fractures of Femur: New Type of Ambulatory Cast for Treatment. S. M. Leydig, St. Louis.—p. 413.
Rocky Mountain Spotted Fever and Typhus Fever Occurring in Missouri. C. T. Herbert, Cape Girardeau.—p. 415.

had been in that stage for ten years or more. Different lots of the extract average about 2.3 decimilligrams of total alkaloids per cubic centimeter and the tablets from 3.1 to 3.5 decimilligrams. In two or three cases there was a question as to whether the parkinsonism was on an arteriosclerotic or encephalitic basis, and in two there was an outstanding psychogenic factor. The patients continued to live in the same environment and under the same conditions as they previously had. They took no other drugs. No special diet was advised. It was recommended that they abstain from alcoholic beverages. The patients were usually started on a dose of 2 cc. of the decoction, or one tablet, taken just before retiring. This dose was increased daily by 1 cc. of the decoction or by one tablet until there was rather marked dryness of the mouth or blurring of vision. None of the patients showed mental confusion. The optimal dose varied between a minimum of from 4 to 8 cc. of the decoction (or the equivalent of the alkaloidal content in tablet form) and a maximum of from 30 to 50 cc. Some patients prefer taking the entire dose just before retiring; others prefer to take the total dose in divided portions. It is most important that these patients be under close medical supervision until the optimal dose is established and under frequent medical observation thereafter. In general, the decoction and the tablets were equally effective. Of the seventy-five patients 22.67 per cent were slightly improved, 48 per cent were moderately improved and 29.33 per cent were greatly improved. Practically all of the patients showed subjective improvement. They felt stronger, were less drowsy during the daytime and rested better at night; they were less tense, more cheerful and less given to fits of depression. Objectively, there was some relaxation of the muscular rigidity. This was shown in an improved facial expression, greater ease in rising from a sitting position, a more normal gait and improvement in speech. In practically all cases salivation was entirely relieved. The profuse perspiration from which a few patients suffered was also definitely diminished. While oculogyric crises usually became less frequent, less severe and shorter in duration, in no instance in the group have they been abolished completely. One case of narcolepsy following encephalitis, of many years' duration, has been improved in a short time, although the results with ephedrine and benzedrine were unsatisfactory.

Northwest Medicine, Seattle

38: 317-362 (Sept.) 1939

- Important Factors in Control of Tuberculosis. L. P. Anderson, Elma, Wash.—p. 321.
Essential Factors in Diagnosis of Tuberculosis. F. S. Miller, Spokane, Wash.—p. 324.
Roentgen Examination in Diagnosis of Pulmonary Tuberculosis. F. B. Exner, Seattle.—p. 327.
Value of Tuberculin Test in Tuberculosis Work. S. L. Cox, Seattle.—p. 329.
Differential Diagnosis of Pulmonary Tuberculosis. P. Schonwald, Seattle.—p. 331.
Erythrocyte Sedimentation Test in Tuberculosis. E. G. Bannick, Seattle.—p. 334.
Case Finding in Tuberculosis. J. E. Nelson, Seattle.—p. 336.
Medical Treatment of Tuberculosis. L. G. Woodford, Everett, Wash.—p. 338.
Collapse Therapy in Pulmonary Tuberculosis. R. C. Matson, Portland, Ore.—p. 340.
Diagnosis and Treatment of Intestinal Tuberculosis. G. C. Bellinger, Salem, Ore.—p. 344.
Relationship Between Silicosis and Tuberculosis. C. H. Vrooman, Vancouver, B. C.—p. 346.
Diagnosis and Treatment of Bone and Joint Tuberculosis. J. F. Le Cocq, Seattle.—p. 349.

Virginia Medical Monthly, Richmond

66: 575-640 (Oct.) 1939

- Herniation of Intervertebral Disk and Associated Lesions: Report of Cases. H. L. Skinner, Baltimore, and J. T. Rountree, Woodstock.—p. 575.
Body Weight and Hemoglobin Concentration. C. R. Spealman, Richmond.—p. 591.
Anomalies of Female Generative Organs: Report of Rather Remarkable Case. P. S. L. Moncure, Norfolk.—p. 593.
Preliminary Report on Dr. Alexander Finikoff's Treatment for Surgical Tuberculosis: Summary of Fourteen Cases. C. H. Dawson, Suffolk.—p. 575.
Pediatric Endocrinology. C. P. Mangum, Richmond.—p. 605.
Obstetric Amnesia, Analgesia and Anesthesia: Special Attention to Their Efficiency and Safety to Mother and Child. C. W. Dorsey, Roanoke.—p. 607.
Intestinal Obstruction. C. H. Lupton, Norfolk.—p. 610.
Intra-Abdominal Hernia. W. A. Johns, Richmond.—p. 620.
Placenta Praevia. V. E. Lasara, Norfolk.—p. 623.
Chemistry of Intelligence. E. Podolsky, Brooklyn.—p. 625.
John Snow's Work on Cholera. W. A. Preston, Richmond.—p. 628.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 671-712 (Sept. 30) 1939

- Estrogenic Hormone Therapy. T. N. A. Jeffcoate.—p. 671.
Glomangioma: Form of "Painful Subcutaneous Tubercle." A. C. Lendrum and W. A. Mackey.—p. 676.
Electrosurgical Obliteration of Gallbladder Without Drainage (Thorek's Operation). H. Bailey and R. J. M. Love.—p. 682.
Urethrography: Technique, Interpretation and Utility. J. Kemble.—p. 683.
Generalized Actinomycosis with Predominant Spinal Symptoms, Including Collapse of Vertebra. G. J. Dixon.—p. 686.

Lancet, London

2: 723-772 (Sept. 30) 1939

- *Personal and Clinical History in Hematemesis and Perforation. D. T. Davies and A. T. M. Wilson.—p. 723.
Hemorrhage in Peptic Ulcer: Review of 241 Consecutive Cases. J. G. Graham, J. C. Alexander and J. D. O. Kerr.—p. 727.
*Late Sequelae of Pulmonary Embolism. T. H. Belt.—p. 730.
Duration of Labor in Primiparas. Violet Spiller.—p. 733.
Blood Complement in Acute Glomerulonephritis and Toxemia of Pregnancy. S. Thomson, W. M. Arnott and G. D. Matthew.—p. 734.
Hematuria During Treatment with Sulfapyridine. T. C. Backhouse.—p. 736.
Lobsters and Gastro-Enteritis: Some Experiments on Cooking and Sterilization. H. M. R. Jones.—p. 738.

Hematemesis and Perforation.—Davies and Wilson call attention to the nervous influences which in certain personality types seemingly play a part in precipitating hematemesis and perforation. They record observations made both on the predisposing factors which long antedated gastric symptoms and on the external events which preceded the catastrophe. The investigations were made on fifty patients recovering from hematemesis and on twenty-five convalescent from an operation for a perforated ulcer. Regarding the fifty patients with hematemesis it was found that the precipitating events classified themselves most readily in relation to money matters, to the nature of their work and to serious illness of near relations, with a small residue of miscellaneous disturbances. Among the patients with perforation they discovered much the same personality types and precipitating situations. As in the hematemesis group, they found that the majority, sixteen of twenty-five, showed some acute episode in their lives which preceded the perforation by a few days. In nine, however, although no such events were found, symptoms of long-standing emotional stress were observable. The fact that events capable of producing unusual emotional tension were found to precede hematemesis and perforation in sixty-three of seventy-five patients appears to provide the evidence that the nervous system does play an important part in their etiology. The authors point out that patients often remark on their improvement after one of these catastrophes. The evidence points to a rapid healing following these major complications of ulcer. Does this fit in with the nervous origin of ulcer? As the authors show in their examples, these patients are harassed and worried by their responsibilities and by environmental changes. When there is acute uncertainty whether they can get through a situation or not, to give in, to resign and admit defeat is incompatible with their makeup. But when blood is vomited there is a sudden change in affairs. Their threatened failures are expiated. Urgent treatment is called for, and all other events become relatively unimportant. Wounded in the battle of life, they have an armistice and with it the possibility of a new orientation. The cares and worries of yesterday now seem relatively unimportant. It may be that this attitude of mind, this new outlook, does play some part in the good results which follow such urgent complications. If the view of the etiology of peptic ulcer implicit in these observations is accepted, there are corollaries in designing treatment. Practical therapy should include an attempt at prevention of these complications. In known ulcer patients avoidance of increased responsibility or of sudden changes in responsibility and encouragement of a more even life may help in the right direction, and during unavoidable stress and anxiety the frequent buffering of hyperacidity is rational. But in prevention by far the most important point is to convince the patient that his mind is capable of bringing distress to his stomach. Once the patient accepts this relation he can, the authors think, do much to put his house in order.

Late Sequels of Pulmonary Embolism.—Belt shows that pulmonary embolism is rarely regarded as the cause of chronic disease. Yet a careful study of the pulmonary arteries at necropsies makes it clear that sometimes it is necessary to reckon with long-standing lesions and morbid processes which appear to be the result of emboli lodged in the lungs months or even years before death. For want of a better term, the condition which the author describes may be called "chronic embolization of the pulmonary arteries." He has collected four representative cases which illustrate the progressive phases of this morbid process. The first patient, a man aged 28, sustained an injury on his left knee; the wound became infected, and the thigh had to be incised for the drainage of pus. Thereafter he had recurrent attacks of pulmonary embolism with pleuritic pain and bloodstained sputum. There were several episodes of increasing severity before the fatal seizure five months after injury. The necropsy revealed evidence of congestive heart failure, old and recent emboli of the pulmonary arteries and old and recent thrombosis of the left iliac veins. The author says that migration of venous thrombus to the lungs is seldom confined to a single event but tends to recur. This case is an example of recurrences over a period of three or four months. The emboli apparently arose from a subclinical thrombosis of the left internal and common iliac veins. This thrombosis was probably a sequel to the injury of the left leg. The second patient, a woman of 77, had recurrent attacks of pleural pain and weakness. She was treated for coronary disease and bronchopneumonia, and several weeks later she suffered two sudden painless attacks of faintness and suffocation. She died with congestive heart failure. The necropsy revealed that practically all the secondary branches of the pulmonary arteries were occluded with old and recent emboli which had arisen from a silent thrombus in the right external iliac vein. There were several small hemorrhagic infarcts of the lungs with associated pleurisy. In the third case the necropsy revealed cor pulmonale with chronic vascular congestion of viscera; fibrous stenosis of the pulmonary arteries, possibly due to organized emboli, and scarring and trabeculation of the left femoral and popliteal veins. The author emphasizes that the lesion which is regarded as an organized embolus is not necessarily static. There may be microscopic deposits of secondary thrombus on its surfaces. These tend to recur and undergo organization, somewhat like the verrucose vegetations of rheumatic heart disease, and may lead to progressive scarring; or there may be extensive development of secondary thrombus, as in case 4. In this latter case necropsy revealed cor pulmonale, old scarring of pulmonary arteries, recent emboli of the tertiary branches and a large plaquelike thrombus of the right main branch. The emboli had arisen from leg veins, which showed old and recent thrombosis. The clinical picture was not unlike that of Ayerza's syndrome. The extensive scarring of the larger pulmonary vessels probably dated back six years to a serious illness. The fatal issue was determined by embolism. The large plaquelike thrombus, which half filled the right pulmonary artery, had its roots in an old scar. It is not difficult to see how such scars as these might result from the organization of large emboli. The author stresses that, if watched for, many emboli of the lungs are seen in routine necropsies; these emboli for the most part are undiagnosed clinically. On the other hand, so few cases of primary thrombosis are seen that, when it comes to deciding between primary thrombosis and embolism, the author always thinks of embolism first, though this is not the common teaching. In all of the reported cases he proved a potential source of embolism. He thinks that if his interpretation is correct, recurrent embolism is a possible cause of chronic pulmonary obstruction and cor pulmonale. Moreover, he believes that some cases of Ayerza's disease may perhaps be explained on this basis.

Tubercle, London

20: 533-572 (Sept.) 1939

- Effects of Varying Degrees of Allergy in Experimental Tuberculosis. C. Clayson.—p. 533.
Silicosis in Slate Quarry Miners. T. W. Davies.—p. 543.
Tuberculosis in Man Due to Bovine Type of Tubercle Bacillus in the Netherlands. A. Charlotte Ruys.—p. 556.
Cutaneous Test for Tissue Reactions in Animals with Dusts Causing Pneumonokontosis. S. R. Giloyne.—p. 561.

Archives de Médecine des Enfants, Paris

42: 545-608 (Sept. 9) 1939

- Arterial Hypertension in Children. R. Pierret and G. Lefebvre.—p. 545.
*Digital Mutilations in Infantile Acrodynia. J. Gadrat, J. Lasserre and R. Petel.—p. 559.
Evolutive and Occult Phases of Primary Tuberculosis in Children: A Cross Section. K. R. Anday.—p. 571.

Infantile Acrodynia with Gangrenous Mutilations.

According to Gadrat and his collaborators, the view long entertained of the benignancy of infantile acrodynia needs to be revised in the light of the investigations of the last fifteen years or more. They report two cases showing ulcerogangrenous complications of the extremities. The first case concerned an infant girl aged 23 months, of healthy parents and with no previous pathologic history. She had been hospitalized five months after the appearance of a general cutaneous eruption diagnosed as eczema and after the further progress of the disease had produced extreme pains, livid discoloration of the skin of the terminal finger bones and a dry gangrene that had necessitated amputation of the thumb of the left hand and implicated the loss of the third bone of the index finger. The clinical examination showed cyanotic, cold and sweaty feet and hands swollen to the wrists, the left hand enormously so, the stump of the index finger disclosing the bone and exhaling a nauseating odor. Treatment consisted of hot baths, local application of an ointment, daily injections of 0.0002 Gm. of acetylcholine and administration of two ampules of liquid liver extract and 0.05 Gm. of phenobarbital. This treatment was reinforced subsequently by ultraviolet irradiations and a vitamin D regimen. The authors' final report of the patient's condition, more than a year after inception of the infection, shows general excellent health, the right hand normal in appearance and size, the left hand well cicatrized but with only the fourth and little finger remaining and the fourth finger almost twice its normal size. The second case concerned a country girl of about 3½ years, of healthy parents. The child had had whooping cough and measles before the end of her second year, but with no complications. Two months before hospitalization she developed great pain in the extremities, swollen hands and feet, an oozing sweat and the loss of the terminal bone of the right fourth finger. Clinical examinations showed feet and hands enlarged, cold and sweaty, the fourth finger necrotic, and tachycardia with a rate as high as 160 per minute. Three days after hospitalization the child suddenly died. Necropsy revealed vasodilatation with intense congestion in all organs and a massive vacuolar degeneration of the cervicodorsal medulla resembling genuine syringomyelia. Interpreting the two cases in the light of the literature, the authors point out that infantile acrodynia complicated by gangrene and resulting in phalangeal mutilation is infrequent, that gangrenous acrodynia is not necessarily fatal and that the majority of serious mutilations occur in infants aged between 2 and 4 years. While gangrene constitutes a formidable complication of acrodynia, its prognosis does not depend directly on gangrenous manifestations. They attribute the disease to neurologic lesions without, however, being able to account satisfactorily for the modifications of the inferior cervical ganglion of the sympathetic nervous system. Acrodynia is probably due, in their opinion, to a neurotropic virus with a special affinity for neurovegetative centers and capable of causing medullar degeneration that may end in syringomyelic cavities.

Schweizer Archiv f. Neurologie u. Psychiatrie, Zurich

44: 1-208 (No. 1) 1939. Partial Index

- The "Endless Analysis" of Freud. R. Markuszewicz.—p. 1.
Monoplegia of Fingers and Tactile Agnosia. L. Halpern.—p. 35.
*Alcohol Hallucinoses and Its Relation to Schizophrenia. K. Huber.—p. 43.
Psychoanalysis and Problems of Human Existence. A. Storch.—p. 102.
Relations Between Structural and Functional Differentiation of Nervous Centers and Traits in Chicken Embryos. F. Visintini and Rita Levi-Montalcini.—p. 119.
Ossification of Choroid Plexuses. G. Will.—p. 151.

Alcohol Hallucinoses and Schizophrenia.—Huber investigated twenty cases of alcohol hallucinoses in order to determine whether and to what extent relations exist between alcohol hallucinoses and schizophrenia. In all of these patients the prolonged abuse of alcohol could be demonstrated, and in five the histories revealed alcoholism in the ascendancy. Two patients presented in addition to the symptoms of alcohol hallucinoses

those of delirium tremens. In six of the patients who had had attacks of alcohol hallucinosis schizophrenia later developed, and in three other patients the hallucinosis had some schizophrenic aspects. With regard to one patient it could not be definitely decided whether in the last attack of hallucinosis a schizophrenic or a senile component was involved. The author says that it must be regarded as definitely established that the specific symptoms of hallucinosis, that is, the auditory hallucinations combined with anxiety, are the result of a direct or indirect alcohol intoxication, for in all these cases abuse of alcohol could be demonstrated and there were no cases of this type in the absence of the abuse of alcohol. In the concluding summary the author says that there are two forms of alcohol hallucinosis: a form in which only the alcoholic factor becomes manifest and which represents the acoustic counterpart of delirium tremens, and a form in which a schizophrenic factor is recognizable in addition to the alcoholic factor. The latter form becomes manifest in that the symptoms of hallucinosis assume a schizophrenic color, that is, either the characteristic symptoms of hallucinosis are based on a mode of experience otherwise characteristic for schizophrenia or a schizophrenic syndrome is added. This latter form frequently changes into schizophrenia. Whether alcohol hallucinosis is of purely alcoholic origin or whether it is a reaction that develops on the basis of a schizophrenic predisposition cannot be definitely decided. Meggendorfer's assumption that tendencies toward schizophrenia are the basis of alcohol hallucinosis seems plausible. On the other hand, it cannot be denied that alcohol hallucinosis represents an independent syndrome and that it may aid in making a latent schizophrenia manifest. This latter assumption seems to be corroborated by the fact that alcohol hallucinosis never develops in the course of an already manifest schizophrenia but always at its onset.

Chirurgia degli Organi di Movimento, Bologna

24:485-588 (Aug.) 1939. Partial Index

Abnormalities and Fractures of Articular Processes of Lumbar Vertebra. C. de Marchi.—p. 485.

Fusion of Second and Third Cervical Vertebrae in Relation to Congenital Torticollis. L. Giuntini.—p. 519.

*Painful Hemisacralization: Pathogenesis, Diagnosis and Treatment. F. Stefani.—p. 565.

Painful Hemisacralization.—According to Stefani, pain in hemisacralization of the fifth lumbar vertebra is due to irritation of sensory osteoperiosteal sensory nervous fibers, without any nervous or radicular lesion. The sensory and motor innervation of the leg, lateral to pain, is normal in hemisacralization, whereas it is disturbed in pain of neuritic or radicular origin. The coexistence of x-ray abnormalities of the vertebra with a normal sensory and motor innervation of the leg indicates hemisacralization. The author proposes a procedure for testing the normality of innervation of the lateral leg. It consists of the administration of an injection of a small dose (not specified by the author) of an anesthetic in solution over the apex of the macro-apophysis, the presence of which is previously determined by x-ray examination of the sacrolumbar segment. The injection is made under radioscopic control, with a needle of about 8 or 10 cm. Diffusion of the anesthetic to nearby structures is avoided. Pain from hemisacralization disappears immediately after the injection. The leg regains function. Both pain and dysfunction of the leg return as soon as the effect of the anesthetic is over. Neither sensory nor motor disturbances appear in the leg in the course of or after the test (positive results from the procedure). Pain from sacralization complicated by either neuritis or radiculitis disappears after the anesthetic from the lumbosacral region and upper part of the leg, whereas it is not modified at the lower part of the leg (partial positive results from the procedure). Lumbosacral pain of either neuritic or radicular origin either is not modified or is slightly modified simultaneously with appearance of sensory and motor disturbances of the leg. According to the author the procedure is of value for the diagnosis of painful sacralization and also for deciding on the operation, which is resection of the macro-apophysis. Five cases are reported. Two patients recovered from the operation (resection of the macro-apophysis). There was one case of the mixed form and one each of rheumatic and spondylolisthetic lumbosacral pain.

Gazzetta degli Ospedali e delle Cliniche, Milan

60:803-836 (Aug. 20-27) 1939

*Blood Transfusion in Treatment of Febrile Rheumatic Endocarditis. G. Rettanni.—p. 803.

Sclerogummatous Syphilis of Gastrocnemius Muscle: Case. B. Rossi.—p. 813.

Hordeine Sulfate in Treatment of Diarrhea. R. Traverso.—p. 818.

Blood Transfusion in Rheumatic Endocarditis.—Rettanni resorted to blood transfusion for ten patients suffering from febrile forms of rheumatic endocarditis. Administration of previous treatment with salicylates had controlled the articular symptoms in all cases without interfering, however, with the progress of the heart disease. The most acute symptoms were those given by the heart disorder, fever and anemia. The author administered 300 cc. of blood for each transfusion every other day until twelve transfusions had been given. In all cases the fever abated and later in the course of the treatment disappeared. The crisis of the blood and general and nutritional condition of the patients greatly improved. The cardiac condition had complete remission (up to clinical recovery) in six cases. Great improvement occurred in two. The treatment failed in two. The author believes that the results of blood transfusion in febrile forms of rheumatic endocarditis are due to several factors: the presence of antitoxic and anti-infectious substances in transfused blood and a special biologic effect of blood by which it stimulates the organic forces of defense against the condition.

Archivos de Pediatría del Uruguay, Montevideo

10:445-508 (Aug.) 1939. Partial Index

*Pathology and Epidemiology of Salmonellosis in Infants. E. Hormaeche.—p. 445.

Non-tuberculous Pulmonary Diseases in Infants with Congenital Syphilis: Case. J. R. Marcos and Sara Mendivil.—p. 463.

Salmonellosis in Infants.—Hormaeche studied, in the course of the last two summer seasons, more than 200 cases of salmonellosis in infants. He found that the infection is caused by salmonellas of the group of *Salmonella enteritidis* but that the clinical picture, evolution and epidemiology of the infection are different from those of food poisoning in adults. Salmonellosis in infants is not produced by intestinal absorption of salmonella from contaminated food. Contagion takes place from convalescent adults (who suffered from enteritis). It is highly contagious among infants. However, older children and adults cannot be infected through infants. It occurs more frequently in summer than in any other season of the year. In some cases it develops with primary intestinal and gastrointestinal disturbances of progressive evolution and different type and acuteness. In other cases the first symptoms show pharyngitis or rhinopharyngitis with fever in the course of which the intestinal and gastric symptoms appear. The enteric pure forms evolve for two or four weeks with alternations of improvement and aggravation. The pharyngeal and rhinopharyngeal forms are frequently complicated by otitis media or meningitis and are grave. A salmonella of animal origin can be isolated from the pharyngeal (or rhinopharyngeal) exudates, the pus of otitis and the cerebrospinal fluid in meningitis. Septicemia may complicate the infection, the rate of mortality of which is high. According to the author the differences between the pathology and epidemiology of salmonellosis in infants and those of food poisoning in adults depend on the following factors: (1) the different sensitivity of infants and adults to the pathogenic action of salmonellas of animal origin, to which infants are highly sensitive, (2) the small number of organisms which are necessary to produce the infection in infants and (3) the pathogenic mechanism of salmonellosis in infants, which resembles that of salmonellosis in animals rather than that of food poisoning in adults. Both in infants and in animals salmonellosis is an infection, whereas food poisoning in adults is a toxicosis. Again, both in infants and in animals the infection may be primarily located in structures other than the gastrointestinal tract, which is the structure mainly involved in food poisoning. The author believes that bronchopneumonia in infants which develops in summer, when complicated by gastrointestinal disturbances, is a form of salmonellosis with primary involvement of the lungs.

Revista Argentina de Cardiología, Buenos Aires
6: 73-136 (May-June) 1939. Partial Index

*Vitamin B₁ in Treatment of Nonanginous Precordial Pain. B. Moia and F. F. Batlle.—p. 73.
Descending Aorta in Roentgen Anteroposterior Position. B. Moia and J. A. Aguirre.—p. 83.
Calcification of Aortic Valves. B. Moia and F. F. Batlle.—p. 108.

Vitamin B₁ in Nonanginous Precordial Pain.—Moia and Batlle say that there is a type of precordial (cardiothoracic) pain which has a different clinical picture and different pathogenesis from those of angina pectoris and pain from coronary occlusion. It may be either mild or acute and persistent or repeated but never paroxysmal or constant. It diffuses from the precordial region to the left pectoral region and radiates to the left arm. It may appear in persons having a normal cardiovascular apparatus or in patients with cardiovascular diseases. It develops predominantly in persons with nervous hyperexcitability. The authors, taking as a point of departure the beneficial effects of vitamin B₁ on painful symptoms which appear in certain nervous diseases, resorted to vitamin B₁ in the treatment of precordial pain in 100 cases. The cardiovascular apparatus of eighteen patients in the group was normal. Nine of the patients had neurocirculatory asthenia, seven had mitral stenosis and sixty-six had hypertension of various intensity, vascular sclerosis, coronary disorders and syphilitic aortitis. In all cases the condition dated from several years back and various treatments had previously failed. Vitamin B₁ treatment was administered every other day parenterally with the dose of 0.001 Gm. for each injection up to a total number of nine injections and in rare cases fifteen. The best results from the treatment were obtained in a group of seventy-eight patients which included persons with normal cardiovascular systems and those who were suffering from hypertension and vascular sclerosis (without involvement of the coronary arteries). Pain disappeared completely in forty cases and temporarily in thirty; eight cases the treatment failed. In the group of sixteen cases of mitral stenosis or neurocirculatory asthenia, pain disappeared completely in five and temporarily in five; the treatment failed in six. Treatment failed in the six cases of vascular sclerosis with coronary involvement. In the cases in which pain disappeared the satisfactory results have lasted up to the present (fourteen months after discontinuance of the treatment).

Beiträge zur klinischen Chirurgie, Berlin
170: 1-190 (Aug. 26) 1939. Partial Index

So-Called Primary Ectopic Cancer. F. Feyrter.—p. 1.
Neurogenic Appendicitis as Partial Manifestation of Endocrine-Nervous Enteropathy. H. Dohn.—p. 24.
So-Called Achilles-Calcaneodinia and Achilles Bursitis. G. Büttner and A. Heidemann.—p. 43.
Perforation of Gastroduodenal Ulceration Following Administration of Contrast Meal. G. Büttner and W. Fangerau.—p. 53.
Further Experience with Roentgen Demonstration of Parotid Gland. E. Simon.—p. 77.
Rheumatic Liver Cirrhosis. E. Volhard and R. Basler.—p. 88.
Healing of Cesarean Section Scar. J. Erbslöh.—p. 91.

Perforation of Gastroduodenal Ulcer.—A review of the literature suggests, according to Büttner and Fangerau, that most authors regard perforation in the course of an x-ray gastrointestinal study as a result of a combination of unfavorable factors, among which the administration of too large a quantity of the contrast meal and the diminished muscle tonus of a dilated stomach play the leading part. In the case described by the authors there existed a long standing duodenal ulceration with a high grade pyloric stenosis and dilatation of the stomach. Barium mixture was given on the first and on the third day of examination. Perforation took place one half day later. In addition to the pyloric stenosis the patient had, as a result of a previous operation for ileus, a double-flint anastomosis in the transverse colon. Inspissated barium partially obstructed the colonic anastomosis and aggravated the gastroduodenal distention. Animal experiments of Himmelmann and Paas demonstrated that the spilling of a contrast meal of the gastric contents, Neeropsy in the authors' case revealed a diffuse, hemorrhagic, fibrinopurulent peritonitis. Almost all of their cases were duodenal ulcer perforations located close to the pylorus and causing partial obstruction. A simple closure of the perforation tended to increase the obstruction. The added

gastro-enterostomy carried out in the friable ulcerated area did not always relieve the situation. It is for these reasons that the authors prefer to carry out a gastric resection provided the patient is in good condition and the perforation is an early one.

Deutsche medizinische Wochenschrift, Leipzig
65: 1297-1332 (Aug. 18) 1939. Partial Index

Insulin Therapy of Schizophrenia. C. H. Roggenbau.—p. 1297.
Therapeutic Applicability of Vitamin B₁. K. Wachholder.—p. 1299.
*Experimental Investigations on Serum Therapy of Poliomyelitis. E. Gildemeister.—p. 1305.
Aspects of Adie's Syndrome. P. Matzdorff.—p. 1307.
New Results of Research on Normal Morphology of Thymus. W. Weise.—p. 1310.
Orogenic Brain Abscess and Its Treatment. D. Kulenkampff.—p. 1311.
Clinical Aspects of Granulocytopenia. H. Geissler.—p. 1315.

Serum Therapy of Poliomyelitis.—Gildemeister says that in Germany the collection and preparation of convalescent serum for the treatment of poliomyelitis is arranged in such a way that serum is obtained only from those persons who have had the paralytic form of poliomyelitis. It is withdrawn at the earliest two months and at the latest ten years after the attack of the disease. The quality of these serums, that is, their content in virus-neutralizing protective substances, differs greatly, even though some equalization is produced by the mixture of several serums. Thus there are mixed serums with good and some with deficient antibody content. Moreover, in patients with the paralytic forms of poliomyelitis the formation of protective substances is much inferior to that which takes place in the nonparalytic and in the abortive forms. Morevoer, it has been said that high antibody contents are encountered in persons from the environment of patients with them. The author decided to verify these reports. He determined that storage for a year, provided of course the serum is kept under suitable conditions, does not noticeably impair the antibody content. The addition of the usual conserving substances was likewise found to be without effect on the antibody content. The author describes the method he employed in the examination of the virus-neutralizing power of four different groups of serums and then reports the results of his investigations. His neutralization tests demonstrated that only half of the convalescent serums from patients with paralytic or nonparalytic poliomyelitis or of the serums of persons from the environment of such patients contain noticeable quantities of protective substances, that serums from patients with nonparalytic forms of poliomyelitis had a higher therapeutic value than had the serums of patients with the paralytic forms, and that serums of persons from the surroundings of patients with poliomyelitis had the least protective value. Serums from the retroplacental blood of healthy women had a surprisingly high protective value. The author concludes that the serum from the meningitic forms without paralysis is best for the treatment of poliomyelitis. To be sure, it will be difficult, if not impossible, to secure adequate quantities of this serum, even aside from the unreliability of the diagnosis of the nonparalytic forms of poliomyelitis. This proves that it is necessary to continue the collection of convalescent serum from patients with the paralytic forms of poliomyelitis. However, serum from nonparalytic cases should be collected, so far as the diagnosis is certain. Only mixed serums should be used for treatment, since only mixture of a number of serums will insure the presence of protective substances.

65: 1333-1368 (Aug. 25) 1939. Partial Index
Dietetics and Its Tasks. S. Bommer.—p. 1333.
*Value of Intracutaneous Test with Indophenol in Estimating Vitamin Supply. H. Beck and F. H. Krieger.—p. 1336.
Pregnancy and Carcinoma: Clinical Observations and Experimental Studies on Spontaneous and Inoculation Tumors. H. Baatz.—p. 1341.
Anthrax in Bulgaria and Its Treatment with Immune Serum. W. Batschwaroff.—p. 1343.
Vitamin B₁ and Leprosy. E. Gminder.—p. 1346.
Care of Stomatitis Ulcerosa by Alkalization. Johanna Wilhelmi.—p. 1351.

Intracutaneous Test for Vitamin C Supply.—After directing attention to the desirability of a reliable indicator of the adequacy of the vitamin C content of an organism, Beck and Krieger show that among the numerous methods which have been suggested for this purpose there are some which

determine the reduction capacity of the urine, others evaluate the vitamin C content of the blood and still others employ tolerance tests. These methods, although suitable for clinical use, have found little application in general practice. It seemed desirable to determine the adequacy of the vitamin C supply by means of a cutaneous test. The authors point out that Rotter employed for this purpose a wheal test with four hundredth normal dichlorophenolindophenol solution. The time required for the discoloration of this wheal indicates the degree of saturation of the tissues with vitamin C. The authors describe their own method of preparing the four hundredth normal dichlorophenolindophenol solution and then describe their experiences with this test on healthy persons as well as on patients in whom C hypovitaminosis was suspected. Their investigations with and without control by simultaneous tolerance tests indicated that this method is adequate for practical purposes. They found that the normal discoloration time of a wheal produced according to their technic is around ten minutes; the threshold value between the average and the inadequate vitamin C supply is between ten and twelve minutes. If the discoloration time is considerably longer, it indicates a vitamin C deficiency; if shorter it indicates saturation. Although the method can be used for practical purposes, it cannot replace the clinical scientific investigations, especially the tolerance test. In studies on the newborn and their mothers, the test disclosed a considerable degree of uniformity of the discoloration time.

Deutsche Zeitschrift für Nervenheilkunde, Berlin

149: 117-196 (Aug. 1) 1939

Myogram in Tabes Dorsalis and in Paralysis. H. Krämer and G. Schaltenbrand.—p. 117.

*Familial Amyotrophic Lateral Sclerosis. H. Curschmann.—p. 133. Mixed Form of Myopathy, Myotonia, Myasthenia with Some Others, Partly Heredodegenerative Symptoms. H. K. G. Bartstra and R. Zijlstra.—p. 141.

*New Method of Convulsion Therapy: Electric Shock Therapy. G. Sogliani.—p. 159.

Pathogenesis of Wassermann Reaction in Cerebrospinal Fluid. H. Demme.—p. 169.

Familial Amyotrophic Lateral Sclerosis.—Curschmann reports the history of a woman, aged 74, who related that as a young girl she had had paresis and muscular dystrophy in the forearms. The increase in the muscular atrophies was extremely slow, so that until six years before he saw her the patient was able to work with her hands. Impairment of the ability to walk dated back only a few years. Severe degenerative muscular atrophy was noticeable particularly in the radial region, but the other muscles of the hand and arm also were involved. The electrical irritability was practically abolished in the atrophic muscles. The muscles of the shoulder and pelvic regions were unimpaired. The patient died of cardiac insufficiency, pyelocystitis and pneumonia. The microscopic examination of the spinal cord corroborated the diagnosis of progressive spinal muscular atrophy, although the expected degenerative changes in the lateral pyramidal tracts and in the anterior tracts could not be observed. This is surprising, since some of the symptoms indicated involvement of these tracts. Especially noteworthy are the early onset, the slow progress, the comparatively mild course, the predominant involvement of the radial region and the absence of the bulbar paralysis. However, of primary interest is the fact that the brother of the patient developed during his youth the same form of muscular atrophy in his arms and legs. The author is convinced that this is an example of progressive amyotrophic lateral sclerosis in two siblings. A review of the literature, especially that of recent years, revealed to the author that the familial occurrence of amyotrophic lateral sclerosis is not as rare as was formerly believed. Among others he cites Kalinowsky, who observed a mother with amyotrophic lateral sclerosis, whose two daughters had a bulbar paralytic syndrome with atrophy of the small manual muscles; Kreyenberg, who detected amyotrophic lateral sclerosis in three siblings; Montanaro and Lopez, who observed amyotrophic lateral sclerosis in a father and three sons, and several other authors who made similar observations. He thinks that in the future careful neurologic studies should be made on the members of the families of patients with spinal amyotrophy and with amyotrophic lateral sclerosis and that studies on twins should also give attention to this group of disorders.

Electric Shock Therapy for Schizophrenia.—In order to avoid some of the dangers of the treatment with metrazol and yet obtain its favorable therapeutic results, Sogliani tried electric shock therapy, which was first described by Cerletti and Bini. The apparatus which the author employs utilizes the available alternating current, which, by means of a transformer, is brought to the desired tension. The current is passed through the head of the patient by means of a hood with two metal electrodes, which are attached to the temples. The author kept the tension constantly at 110 volts and adjusted the main contact breaker in such a manner that not more than 400 milliamperes passed through. The time necessary for the production of the convulsive attack he determined in each case by first passing the current through for half a second and then, after an interval of from ten to fifteen seconds, he repeated the electrical discharge for a time sufficient to elicit the convulsion. The thus determined optimal length of time which each patient required for the passage of the current in order to elicit the convulsion was subsequently employed for the elicitation of all attacks. The majority of patients required from 0.7 to 0.8 second for the passage of the current. The convulsive attacks thus elicited by electric shock are similar to those elicited by metrazol, but there are also differences in that, after the passage of the current, loss of consciousness results at once and the patient stretches in clonic convulsion without the cry so often heard in the metrazol convulsion. Furthermore, even in the rare instances in which an interval elapses between the passage of the current and the convulsion, the patients do not show the expression of fright and terror with dilatation of the pupils and rigid stare which they do at the onset of the metrazol shock. Moreover, the state of excitation so frequently seen after the metrazol convulsion is absent after electric shock. The electric shock can be repeated without danger after a few minutes. When the patient is about regaining his consciousness, the current may be passed through again to elicit a new convulsion. In physically healthy subjects the author elicited four or five convulsions in this manner. He gives the electric shock treatment every second day. The total number of treatments required varies between five and thirty. The first favorable results are usually noticeable after from three to ten attacks or they entirely fail to develop. Nevertheless the author subjects every patient to at least twenty attacks and after a certain interval he begins a new series of treatments. He reports the results he obtained with electric shock therapy of 100 patients. Of seventy-three patients with schizophrenia, fifteen were cured, three improved and fifty-five were not influenced. This shows that the percentage of cures did not exceed that of spontaneous regressions. However, the schizophrenic patients subjected to shock therapy belonged nearly all to that group of chronic patients who neither exhibited spontaneous regression nor had been improved by other methods of treatment. Of the twenty-seven patients with manic depressive psychosis, twenty-two could be discharged; that is, 81 per cent. This high percentage is even more impressive if the duration of the disease is taken into consideration, for among those who were cured there were several who had been institutionalized for several years. In view of this fact, the author recommends the use of electric shock therapy for old cases of depressive psychosis in which other therapeutic methods have failed.

Klinische Monatsbl. f. Augenheilkunde, Stuttgart

103: 145-272 (Aug.) 1939. Partial Index

Survey Over Operations for Cataract Done with New Technic During 1938. K. Lindner.—p. 156.

Peculiar Form of Lenticular Regeneration (Multiple Free Lentoid Formation) in Secondary Cataract in Family with Hereditary Perinuclear Cataract. F. Riedl.—p. 169.

Lamellar Cataract and Spasmophilia. E. Gscheidel.—p. 194.

Bilateral Gummatous Syphilis of Lacrimal Gland. F. W. Meyer.—p. 200.

*Corneal Ulcer and Protosil (Sulfanilamide). Roggenkämper.—p. 211.

*Efficacy of Sulfanilamide in Gonorrheal Diseases of Eye. W. Kattiofsky.—p. 214.

Vitamin B₁₂ in Treatment of Hypovitaminosis. Ida Czukrász.—p. 221.

Corneal Ulcer and Sulfanilamide.—Roggenkämper says that for a period of six months he treated all cases of corneal ulcer with sulfanilamide. The substance was given internally and by subconjunctival injection, but the author did not neglect to employ also the former therapeutic measures, such as shock therapy in the form of intramuscular injections of milk and the customary local methods. Thus the subconjunctival injection

of sulfanilamide was an auxiliary measure in the twenty-six cases on which this report is based. In fifteen of the twenty-six cases there existed posttraumatic serpiginous ulcers of various ages and extension, and in nearly all of them hypopyon existed. In all these cases the therapeutic results were surprisingly favorable as regards rapidity of cure as well as the final results. Among these cases of serpiginous corneal ulcers there were some which at the time of hospitalization gave the impression that only splitting of the cornea would prevent a panophthalmia. However, treatment with sulfanilamide made this unnecessary. The delicacy of the resulting corneal scars and the visual acuity were surprising. This applies to new cases in which the ulcers yielded to from one to three injections as well as to old cases in which nearly all hope had been abandoned and in which from six to eight injections of 0.5 cc. each were necessary to produce epithelization. Surgical operations were unnecessary and the author regards this as an essential advantage of the sulfanilamide therapy. In the scrofulous and catarrhal ulcers of the cornea the effect of the subconjunctival injections of sulfanilamide was not as favorable as in the typical serpiginous traumatic ulcers, but even there a favorable effect could be noticed. It is possible that the bacterial superinfection of these ulcers was excluded by the sulfanilamide. Favorable effects of subconjunctival injections of sulfanilamide were observed also in two cases of persistent parenchymal infiltrations following erosions and in three cases of infected erosions. In superficial keratitis, however, no effect was noticeable. The author concludes that sulfanilamide is of great value in infectious corneal diseases and that in serpiginous ulcers it may make surgical operations superfluous.

Sulfanilamide in Gonorrheal Eye Diseases.—The favorable results obtained with sulfanilamide in cases of gonorrhea induced Kattiofsky to try this treatment in four cases of gonorrheal conjunctivitis of the newborn. Fearing the toxic effects of the oral administration of sulfanilamide, he decided to apply it locally in the form of an ointment. He found that the therapeutic results of the local administration of sulfanilamide were not better than those of the customary therapy. However, he cites investigators who observed favorable results from the oral administration of sulfanilamide in the gonorrheal conjunctivitis of the newborn. He further describes the clinical histories of two adults with gonorrheal eye diseases. Favorable results in both of them were obtained with the oral administration of sulfanilamide. The author concludes that the chemotherapy of gonorrheal eye diseases by means of sulfanilamides represents a valuable addition to the therapeutic possibilities in these disorders.

Münchener medizinische Wochenschrift, Munich

86: 1297-1336 (Aug. 25) 1939. Partial Index

- Is Serum Effective in Diphtheria Gravisissima? H. Müller and H. Seidlmayer.—p. 1297.
Poisoning with Thallium Dust. W. Schwarte.—p. 1299.
Prophylaxis and Therapy of B Hypovitaminoses by Means of Yeast Concentrates. F. Diehl.—p. 1301.
How to Manage War Neuroses in Future Wars. F. W. A. Weber.—p. 1305.
Lesions Caused by Indelible Pencils. W. Mühlbacher.—p. 1307.
Treatment of Epidermophytosis of Feet. P. Kissinger.—p. 1308.
*Clinical Aspects and Diagnosis of Chronic Traumatic Hernias of Diaphragm. H. Brandt.—p. 1312.

Traumatic Hernias of Diaphragm.—Brandt says that traumatic diaphragmatic hernia, that is, the displacement of abdominal viscera through an opening into the thoracic cavity, is usually a false hernia, because it is not surrounded by a hernial sac. Nevertheless, in case of tangential bullet wounds, true diaphragmatic hernias have been observed in that only the diaphragmatic pleura or only this pleura together with the musculotendinous tissue was injured, while the peritoneum was not opened. The clinical aspects of traumatic diaphragmatic hernias vary greatly. On the basis of material from the literature, the author differentiates two main groups, the acute and chronic diaphragmatic hernias. The acute traumatic hernias of the diaphragm he classifies into those with and without signs of incarceration. In this report he takes up the chronic traumatic hernias of the diaphragm. He gives detailed clinical histories of two cases. The first patient had sustained injuries in an automobile accident. With the exception of occasional drawing pains

in the epigastric region after big meals, the patient felt well for more than a year after the accident. Then he developed acute symptoms. At first diaphragmatic hernia was not thought of because there had been no trauma in the thoraco-abdominal region. Finally the condition was diagnosed as gastric volvulus and an operation was performed. Two days later the patient died. The surgical observations and the necropsy indicated that the accident caused a tear in the diaphragm and that the prolapsing omentum became fixed by adhesions. The occasional symptoms may have been caused by dragging or temporary incarceration of the stomach in the tear. It is not probable that the stomach had been in the thoracic cavity uninterruptedly since the accident. The necropsy disclosed a diaphragmatic tear 8 cm. in length, and it is assumed that at the time at which the acute symptoms began a portion of the bloated stomach passed through the tear and, as a result of the suction exerted by the negative pressure in the thorax, the stomach was drawn more and more into the thorax and was incarcerated in the diaphragmatic slit. A spontaneous return of the stomach was made impossible because it had been turned in such a manner that the great curvature was located forward and above. The second patient had sustained an accident which had produced a pelvic fracture and internal injuries. Here again the trauma did not involve the thoraco-abdominal region directly. The operation disclosed a diaphragmatic opening the size of a fist through which parts of the stomach and of the intestine entered the pleural cavity. This patient had severe symptoms continuously. The author shows that the hernias of the two patients represent two different types of chronic traumatic diaphragmatic hernia. The first patient had that form which exists for a long time without disturbances but in which an incarceration may suddenly cause severe symptoms; the second patient had the form of chronic diaphragmatic hernia which constantly causes symptoms. In the conclusion the author stresses among other points that, even if a trauma did not directly involve the thoraco-abdominal region, the possibility of a diaphragmatic hernia should be thought of whenever the abdominal organs cause symptoms in these cases. It should also be considered that a symptom-free interval may exist between the injury and the appearance of signs of incarceration.

86: 1337-1372 (Sept. 1) 1939. Partial Index

- Gangrene, Its Prodromes and Treatment. E. Seifert.—p. 1337.
*Clinical Study and Pathogenesis of Subarachnoid Hemorrhages. G. Landes.—p. 1340.
Afuction in Atrophic Gastritis. A. Mahlo.—p. 1341.
Effect of Ephedrine on Muscle Activity. A. Szakall.—p. 1344.

Subarachnoid Hemorrhages.—According to Landes, the classic picture of what is generally designated as subarachnoid bleeding is characterized by violent cephalalgia, sudden loss of consciousness, physical collapse in apparent health, marked meningeal signs and the bloody appearance of the cerebrospinal fluid in lumbar puncture, together with a high frequency of mortality reported in earlier medical experience. On the basis of eight cases—there were six men and two women between the ages of 18 and 66, with seven cures after an average clinical management of five weeks (treatment not indicated) and one fatality—the author calls attention to the variability of the characteristics, neurologic as well as clinical, in the symptomatology of this disease. Lumbar puncture, initially performed, yielded a sanguineous fluid with pressure as high as 400 mm. of water. In subsequent assays the fluid appeared clearly xanthochromic. Initial erythrocytic counts numbered uniformly from 40,000 to 50,000; after eight days erythrocytes were no longer discernible. No initial preponderance of leukocytes, a typical sign of hemorrhagic meningitis, was observed. However, in most cases, contrary to the literature, leukocytic calculation was essentially higher, amounting to from 600 to 11,000 leukocytes per cubic millimeter, and after a week and later still yielded from 60 to 80 per cubic millimeter. Carefully conducted bacteriologic investigations, extended to include detection of anaerobic agents, remained negative. In three cases albumin in the spinal fluid was out of proportion to the blood content. The sugar content was generally high and averaged 80 mg. per hundred cubic centimeters. Syphilis was clinically excluded. Psychologic changes observed in all cases ranged from initial states of confusion and disorientation as to time and place to

considerable disorders of the memory and the faculty of attentiveness and lasted in some cases as many as four months. Necropsy performed in the single fatal case revealed local softenings with red infarct in the right temporal lobe and perforation of the lateral ventricle, microscopy indicating a dense leukocytic barrier about the infarct. Etiologically considered, death in this case may be accounted for as due to serious vasomotor disturbances. In the analysis of the other cases, the author's conjecture ranges from an aneurysm at the base of the brain to a causative agent of more inflammatory nature. Long continuing mental disturbances may indicate encephalitic processes in which the soft meninges are involved. Genuine hemorrhagic meningitis is not assumed. The author inclines to regard subarachnoid bleeding as a syndrome rather than a disease entity with a uniform etiology.

Vestnik Khirurgii, Leningrad

57: 587-672 (June) 1939. Partial Index

- Operative Intervention in Echinococcus Disease. M. A. Gropyanov.—p. 587.
 *Operative Treatment of Congenital Cerebral Hernia. N. I. Sokolov.—p. 593.
 Malignant Goiter. V. A. Kartavin.—p. 606.
 Sympathectomy and Ramisection of Thoracic Portion of Sympathetic Trunk. S. S. Sharimanyan.—p. 614.
 Chronic Appendicitis as Related to Gastric Duodenal Disorders. O. G. Plisan.—p. 616.

Congenital Cerebral Hernia.—Sokolov has reviewed all cases of congenital encephalocele reported by Russian surgeons. Of the 143 patients, 119 underwent an operation; of these forty-three died, the mortality rate being 36.1 per cent. Of the 107 patients with frontal ethmoid encephalocele thirty-six died (33.6 per cent); in three the results seem doubtful (2.8 per cent). Recovery was obtained in sixty-eight (63.6 per cent). The author reports eight cases observed by himself and offers his own hernia plastic technic. His conclusions are as follows: 1. The frontal ethmoid encephalocele is more common in the Soviet Republic, the occipital variety being rather rare. 2. Infants with frontal ethmoidal cerebral hernia display remarkable viability. 3. Infants with cystic encephalocele should be operated on at the earliest possible time, even during the very first days of life. In doubtful cases treatment may be postponed till the infant is a month old, but it should always be performed in the first year of life. 4. In cases of considerable bony defect the symptoms may seem grave, but they disappear after the plastic closure of the defect. 5. The inner opening of the bony canal in nasofrontal hernia has unequal axes, the transverse axis usually exceeding the rest; this is especially true in naso-ethmoid hernia. The shape of the inner opening of the bony canal approaches an oval, the edges being fairly even. 6. The author recommends one stage, external operation, the procedure for posterior orbital hernia being an exception to the rule. 7. In naso-ethmoid and nasofrontal encephalocele the closure of the inner opening of the canal with a bony graft inserted from the inside of the skull insures good results. The access to the inner opening is gained by means of mobilizing the anterosuperior and partly the lateral walls of the bony canal. A graft of a size exceeding that of the defect and completely covering it can be introduced into the cranial cavity without any difficulty, for which purpose the difference in the axes of the canal is made use of. 8. In the anterior orbital hernia the short narrow canal should be completely eliminated by the introduction of a pinlike cartilaginous graft. 9. The author believes a free bony autoplasmic graft to be the best material for the closure of large defects in encephalocele, the cartilaginous autoplasmic graft being the best in smaller defects.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 1971-2032 (Aug. 8) 1939. Partial Index

- Results of Supporting Local Therapy of Trachoma by Sulfanilamide and Antihomaline (Antimony Preparation). J. Schwarz.—p. 1971.
 *Eye Symptoms in Patients with Leiodystonia and Sprue: Aknephascopia. P. H. Pock-Steen.—p. 1986.
 Lichen Scrofulosus. D. P. R. Keizer.—p. 2007.
 Case of Pellagra Treated with Nicotinic Acid. Salekan.—p. 2013.

Eye Symptoms in Leiodystonia and Sprue.—Pock-Steen calls attention to eye symptoms that he observed in about 100 patients with leiodystonia, sprue and sprue-like disorders. The most noteworthy eye symptom was a reduced visual acuity

during weak daylight, such as twilight and during inadequate artificial illumination. The author designates this symptom as twilight blindness or aknephascopia. The twilight blindness is due to a diminished susceptibility to the light waves. It differs in nature from the well known night blindness. It is not influenced by the administration of vitamin A, as is night blindness, but it is greatly ameliorated a few hours after the administration of approximately 1 mg. of riboflavin (vitamin B₂). Of 109 patients, sixty-seven stated without hesitation that their vision was greatly improved following the first injection of 1 mg. of riboflavin, whereas thirty-one were able to corroborate this only after a longer period. The remaining eleven patients observed only a slight improvement in their visual acuity. The author observed that the symptoms of twilight blindness were usually greater in those patients with sprue who had anomalies of refraction. In these cases the effect of riboflavin on the visual acuity was not always as favorable as in the cases of sprue without anomalies of refraction. Nevertheless even in these cases surprisingly favorable results were obtained. In this connection the author mentions a patient aged 64 who stated that in two years he was obliged to change his glasses three times for stronger ones, but after his sprue had been treated with injections of riboflavin he could return to the use of his first pair of glasses. The author thinks that the twilight blindness is a symptom of a general B₂ hypovitaminosis and the only one known that can be observed clinically. Other eye symptoms observed in sprue are mydriasis, conjunctival irritation, keratitis and disturbances of accommodation. The burning pains of conjunctivitis were also found to decrease after the administration of riboflavin. The author thinks that the eye symptoms of patients with sprue are partly the result of B₂ hypovitaminosis and partly the consequence of the histamine toxicosis prevalent in sprue.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 4385-4492 (Sept. 9) 1939. Partial Index

- Vomiting in Nurslings. C. H. Verboom.—p. 4387.
 Influence of Epinephrine and Atropine on Development of Tumors Induced by Injections of 1-2-5-6 Dibenzanthracene in White Mice. A. M. Lorentz de Haas.—p. 4395.
 *Syphilis Resistant to Therapy. M. Ruiter.—p. 4404.
 Treatment of Migraine. C. T. van Valkenburg.—p. 4412.

Syphilis Resistant to Therapy.—Ruiter cites observations made in a small town in which no new cases of syphilis had been observed for a number of years. Then a primary infection was discovered in a prostitute coming from another town, and subsequently there was an epidemic of syphilis. This outbreak of syphilis was noteworthy because of the high percentage of cases that proved resistant to chemotherapy. The author describes the histories of eight patients, in six of whom there developed, in the course of their treatment, a resistance to chemotherapy. The majority of the patients whose syphilitic infection proved refractory to chemotherapy exhibited psoriasisiform papules, one patient had a pustulous rash with distinct mucosal lesions, and in one patient with drug-resistant primary syphilis a malignant type of syphilis developed. In spite of florid skin lesions, the serologic reactions were often found negative. The author mentions the types of chemotherapeutic substances that were used, also the doses given and the intervals that elapsed between administrations. He shows that with the exception of the first patient, who proved resistant to neoarsphenamine and sodium arsphenamine but who showed some response to bismuth, all patients had a resistance to plurivalent therapy. The fact that two drug-resistant women who were treated with arsenicals during pregnancy gave birth to healthy children seems to indicate that an arsenicoresistant variant of *Spirochaeta pallida* could be excluded. Nevertheless, the author assumes that the spirochetes contributed to some extent to the high incidence of resistance to chemotherapy. In remarks about how the resistance to drugs can be counteracted in syphilitic patients, the author mentions E. Hoffmann's method and the "saturation" treatment of Sehreus. Furthermore, in some cases changing of the preparations or strengthening general treatments might prove helpful. If the resistance is plurivalent total, the author recommends a trial with fever therapy.

had been prescribed in five. Recurrences sometimes appeared fairly soon, but generally the improvement lasted for several months after the treatment. The results were encouraging and the method is recommended for further trial.

Acta Tuberculosea Scandinavica, Copenhagen

13: 193-424 (No. 3-4) 1939. Partial Index

- Allergy and Immunity (Iatberg) in Experimental Tuberculosis: IV. Degree of Tuberculosis in Guinea Pigs Prevented from Becoming Tuberculin Hypersensitive. K. Birkhaug.—p. 221.
 *Saprophytic Acid-Fast Bacilli as Source of Error in Diagnostic Work. Vera Lester.—p. 251.
 Experiences and Results of Phrenic Nerve Operations Performed After Certain Periods of Observation. B. Nordgren.—p. 286.
 Housing Conditions Among Tuberculous Patients in Oslo. A. Strøm.—p. 301.
 Deaths Due to Angina and Granulocytopenia Following Treatment with Sanocrysin. K. Søndergaard.—p. 318.
 Experimental Investigations Concerning Question of Division of Adhesions by Diathermy or Galvanocautery. K. S. Stein.—p. 350.
 *Tuberculous Lower Lobe Cavity. K. Törning and A. Springborg.—p. 366.

Acid-Fast Bacilli as Source of Error.—Lester points out that the acid-fast saprophytes deserve attention because they belong to the myobacteria and are closely related to the tubercle bacilli. She decided to determine the frequency of occurrence of acid-fast saprophytes in the specimens submitted for bacteriologic diagnosis. During the five years from 1932 to 1936 inclusive, 26,343 specimens were examined at the tuberculosis department of the State Serum Institute of Copenhagen and 130 acid-fast saprophytic bacilli were isolated. An increase in the number of acid-fast saprophytes was seen following two improvements in the technic: the change from Petroff's medium to an egg asparagin medium containing 0.75 per cent of glycerol and the replacement of sodium hydroxide by 6 per cent of sulfuric acid for homogenization. The author describes the methods that are used for differentiating saprophytic acid-fast bacilli from tubercle bacilli and shows that three procedures proved valuable: (1) prolonged observation of the primary culture, (2) subculture on solid egg medium and in Besredka's fluid medium and (3) intracutaneous inoculation into guinea-pigs. Some strains of special interest are described in detail. No attempts are made to classify the acid-fast saprophytic bacilli, as no adequate serologic or biochemical methods are as yet available. In fifty-five of the 130 strains the colonies had a bright orange color. It is not possible to determine if they form a group apart, but these strains seem at least to have some features in common. None of the 130 strains were pathogenic for guinea pigs in the doses used, but the most dysgonic of those growing in orange-colored colonies produced small abscesses following intracutaneous injections. No propagation was seen, and the abscesses healed spontaneously in a few weeks. Some of those strains were examined by injection of higher doses into guinea pigs and rabbits, but only local regressive lesions were seen. One avian tubercle bacillus was included in the material. Culturally it showed some resemblance to the dysgonic chromogenic saprophytes, but, by virulence tests in guinea pigs and rabbits, it was classified as a typical avian tubercle bacillus. Only about one fifth of the strains observed by the author resembled the eugonic, more or less pigmented cultures most often described in the older literature as acid-fast saprophytic bacilli. The source of the saprophytes found in cultures from human material could not be determined. In some cases it seemed probable that the saprophytes were brought into the specimens at the hospital, in a few other cases the laboratory had to be suspected. The author emphasizes that in diagnostic work it should always be remembered that many of the acid-fast saprophytes greatly resemble atypical tubercle bacilli, which, however, are rare. A strain that cannot be definitely identified as a human or bovine tubercle bacillus should not be discarded until it has been thoroughly examined by cultural and animal tests.

Tuberculous Cavity of Lower Lobe.—Törning and Springborg show that when the treatment is to be selected not only the size and the pathologic-anatomic character of a tuberculous cavity but also its localization must be considered. In view of the fact that roentgen examination is generally limited to one plane, the frontal, it has been possible to localize the cavity only in this one plane. The current terminology shows that this limitation has been forgotten, for most of what has

been written of "central" cavities is based on the observation of cavities which in the frontal pictures were located medially, near the hilus, while they might very well have been peripheral, situated immediately beneath the anterior or posterior surface of the lung. A more precise localization of the cavity requires roentgen study in several planes. In this paper the authors give an account of cases that met two requirements: (1) There was a cavity measuring at least 2 cm. in diameter and located below the level of the pulmonary artery at the hilus of the lung; (2) the pulmonary lesion was entirely unilateral and apart from the cavity there was nothing pathologic in the lungs (nineteen cases) or merely small, sharply defined shadows that could be interpreted as signs of a healing process (two cases). The authors give brief histories of these twenty-one cases and indicate in sketches the localization and the size of the cavities. In fourteen of the twenty-one cases in which the solitary cavity below the level of the pulmonary artery could be located exactly, it was situated posteriorly in the lower lobe. The juxtahilar ("central") cavities, four altogether, were all markedly peripheral, situated posteriorly in the lung. Of seventeen patients treated with pneumothorax an adhesion-free pneumothorax was obtained primarily in nine and after cauterization in four. These patients are all well. Of three patients with noncauterized adhesions to the area of the cavity, two died. Whenever an adhesion-free pneumothorax was obtained the results were just as good in patients with large cavities as in those with small cavities. When there is a solitary cavity and the process of infiltration is limited to the circumference of the cavity, if active treatment seems indicated, it should always commence with an attempt at pneumothorax, regardless of the location and size of the cavity.

Nordisk Medicin, Helsingfors

3: 2593-2668 (Aug. 26) 1939. Partial Index

Medicinsk Revue

- Experiences with Treatment of Gastric and Duodenal Ulcers with Larostidin. G. Bøe.—p. 2607.
 Dyslexia and Dysgraphia in School Children. C. Looft.—p. 2621.
 *Aneurysms of Brain. E. Hval.—p. 2626.
 Duration of Confinement to Bed after Operations. N. Backer-Grøndahl.—p. 2630.
 Short Wave Therapy of Salpingitis. H. F. Dahl.—p. 2632.

Aneurysms in Brain.—Hval cites Römcke and Ustvedt, who report from Ullevaal Hospital that subarachnoid hemorrhages occur in one of every twenty-nine apoplexies and that of their twenty-seven cases fourteen involved persons under 50 and eight persons under 30. A large number of such hemorrhages, Hval says, are due to rupture of aneurysms at the base of the brain. The aneurysms are usually of the size of a pea or smaller; careful examination is necessary to establish them. Since subarachnoid hemorrhages often lead to death in apparently well persons in the prime of life they are important in medicolegal cases, and traumatic aneurysms are of special interest. In the first of the five cases of subarachnoid hemorrhages described, in a man aged 23 who died sixteen days after trauma of the head, necropsy showed unusual and marked changes in the vertebral artery, together with a process undergoing organization and the development of a pseudo-aneurysm at the site of the rupture. If the fatal hemorrhage had not occurred, a permanent aneurysm would probably have resulted ("traumatic aneurysm"), although the vascular changes were of primary importance. In the other cases pea-sized aneurysms had ruptured. In one case the aneurysm was in the middle cerebral artery and due to arteriosclerosis; in one case in the anterior cerebral artery, with degenerative changes in the vascular wall and calcifications in the internal elastic membrane, and in two cases in the inferior posterior cerebellar and the left posterior cerebral artery, respectively, with syphilitic endarteritis and leptomeningitis and calcifications. In the sixth case presented, sudden death occurred after a cerebral tumor probably in the hypophysis had been suspected. An aneurysm the size of a pigeon's egg was found in the circle of Willis adherent to the optic chiasm and extending from the right posterior communicating artery. The ventricle system was filled with blood. There were no signs of arteriosclerosis or degenerative changes in the blood vessels, and congenital origin of the aneurysm is thought possible.

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SOME CLINICAL NEUROLOGIC ASPECTS OF VITAMIN B DEFICIENCIES

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CINCINNATI

Vitamin B₁ (thiamin, aneurin, catorulin) and nicotinic acid are the only components of the vitamin B complex which are known to be of significance in the maintenance of normal neurologic function, in man (fig. 1). The use of these substances in the treatment of various neurologic diseases will be discussed in this presentation. A discussion of the diagnosis of the neurologic diseases incident to a deficiency of these substances must be slighted because of the limitation of space.

VITAMIN B₁

Neuritis.—Neuritis means disease of the neuron (Brown¹). The principal causes of neuritis may be grouped under six inclusive headings, given in the accompanying table, as has been done by Cobb and Coggeshall.² As the causes of neuritis are better understood, such clinical classifications will be replaced by classifications based solely on etiology.

Localized Neuritis: This type of neuritis usually occurs in ambulatory patients, and the mechanical or infectious agent can often be determined by clinical methods. The symptoms usually respond to medical and surgical therapy. Relief of localized neuritis following the administration of crystalline vitamin B₁ has been reported by some investigators. Such reports, however, tend to be misleading, since physicians who obtain negative results are less prone to report them. Furthermore, the number of reported cases is small, and in general the studies have not been adequately controlled. Hence the results need confirmation. Likewise, no conclusive reports have as yet appeared in the literature concerning the value of vitamin B₁ in the prevention of localized neuritis.

We have observed the relief of the acute pain in a case of brachial neuritis occurring six weeks after mastectomy, with the use of daily intravenous injections

of 50 mg. of vitamin B₁³ in sterile physiologic solution of sodium chloride for seven days.

Generalized Polyneuritis: Virus Polyneuritis. The virus diseases listed in the table are often characterized or accompanied by peripheral neuritis as a late complication. No crucial observations have been made to determine whether faulty nutrition plays a role in the development of the neuritis seen in these diseases. The small amount of experimental evidence available tends to show that vitamin B₁ does not play any direct specific role in counteracting the effects of these infectious agents.

Our experience with three cases of infectious polyneuritis has been that some of the neurologic symptoms have progressed despite large intravenous doses (50 mg. twice a day) of thiamin.

Bacteriotoxic Polyneuritis. The diseases in this group often interfere with proper nutrition and thus predispose the patient to the development of a deficiency of vitamins. Many patients with an infection also have an increased requirement for certain essential nutritive substances. In typhoid, for example, the requirement for vitamin B₁ is increased because of the fever, loss of appetite or excessive diarrhea. The incidence of peripheral neuritis in patients with typhoid was high a few decades ago, when an effort was made to restrict the diets of such patients. The great decrease in the incidence of peripheral neuritis in typhoid in recent years is probably due to prescription of adequate diets in the treatment of that disease. There is little information concerning the role of vitamin B₁ deficiency in the development of any of the neuritides accompanying bacteriotoxic diseases, but a number of reports have indicated that the administration of vitamin B₁ often relieves the symptoms of neuritis in these cases. It is known that the neuritis of certain persons with infectious diseases disappears after the administration of a well balanced diet.

The neuritis accompanying acrodynia possibly belongs under this heading. Durand, Spickard and Burgess⁴ reported the cure of acrodynia in two children following intramuscular injections of vitamin B₁.

Chemical Polyneuritis. There are many chemical substances which may produce peripheral neuritis. Not every person exposed to the same chemical agent, however, responds in an identical manner. There is clinical evidence showing the predilection of some of these substances for special portions of the nervous system.

The course of two cases of triorthocresyl phosphate poisoning (jamaica ginger paralysis) shortly after the onset of symptoms was unaltered by the use of large amounts of crystalline vitamin B₁ by mouth. One of the

This work was supported by grants from the Rockefeller Foundation and the Charles E. Fleischmann Fund.

From the Department of Internal Medicine and Neurology and the Laboratory of Neuropathology, University of Cincinnati College of Medicine.

Read before the joint meeting of the Section on Pathology and Physiology and the Section on Nervous and Mental Diseases at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Brown, M. R.: Diagnosis and Treatment of Polyneuritis, M. Clin. North America 22: 627-636 (May) 1938.

2. Cobb, Stanley, and Coggeshall, H. C.: Neuritis, J. A. M. A. 103: 1608-1617 (Nov. 24) 1934.

3. Furnished by Merck & Co., Inc.

4. Durand, J. L.; Spickard, V. W., and Burgess, Ernest: Acrodynia Treated with Intramuscular Injections of Vitamin B₁, J. Pediat. 14: 74-78 (Jan.) 1939.

patients received 20 mg. daily for one month, and the other received 500 mg. daily for the same length of time. It is theoretically possible that large amounts of vitamin B₁ crystals given before the ingestion of triorthocresyl phosphate might act as a protective agent. It has been reported that the administration of vitamin B₁ causes relief of the symptoms of the neuritis following exposure to toxic agents such as nicotine, lead, thallium, arsenic and mercury. As yet, however, there is no conclusive evidence that the lack of vitamin B₁ plays a major role in the development of any of the "chemical neuritides."

We have noted improvement in a case of emetine neuritis following the administration of large doses of vitamin B₁, first given intravenously in sterile physiologic solution of sodium chloride and then by mouth. The relief was marked after the first day of treatment, and there was complete relief of symptoms at the end of the third month of treatment. We have been unsuccessful

in relieving the neuritis of a young man, a worker with refrigerants. The most likely offender in this case was methyl chloride.

addicted to alcohol, Korsakoff's syndrome develops. This clinical syndrome is characterized by a peripheral neuritis which is identical with that of beriberi and by a psychosis often resembling the mental changes seen in pellagra.

We have had experience with the neuritis of pellagra, pernicious anemia, beriberi ("alcoholic and nonalcoholic neuritis"), tuberculosis and pregnancy. These neuritides, excepting possibly the neuritis encountered in pernicious anemia, respond promptly to large doses of vitamin B₁. We usually administer thiamin intravenously, giving 50 mg. twice a day for one week. The initial response to this treatment is usually rapid. Pain is usually greatly relieved within twenty-four hours, and strength, accuracy and speed of movement are usually improved within three days, this improvement possibly being due to the conspicuous relief of pain. If analgesics have been used they may often be discontinued at this time, and patients who have slept little or not at all for weeks may be able to sleep with no medication other than vitamin B₁. The relief which usually occurs in this group of nutritional deficiency neuritides is abrupt and dramatic. Patients previously

Principal Causes of Neuritis

Neuritis					
Generalized Polyneuritis				Localized Neuritis	
Virus	Bacteriotoxice	Deficiency or Metabolism	Chemical	Mechanical	Infectious
Measles	Focal infections	Pellagra	Mercury	Pressure	Diphtheria
Smallpox	"Rheumatism"	Pernicious anemia	Lead	Tumor	Tetanus
Chickenpox	Erysipelas	Sprue	Silver	Edema	Streptococci
Parotitis	Scarlet fever	Beriberi	Arsenic	Arthritis	Leprosy
Herpes	Rheumatic fever	"Alcoholic neuritis"	Phosphorus	Fibrosis	
"Acute febrile"	Chorea	"Korsakoff's psychosis"	Methyl alcohol	Trauma	
"Acute infective"	Septicemia		Ethyl alcohol	Saturday night paralysis	
"Landry's"	Puerperal fever	Pernicious vomiting	Ethyl iodide		
Poliomyelitis	Gonorrhea	Hunger edema	Trichloroethylene	Vollmann contracture	
Encephalomyelitis	Meningitis	Pregnancy	Carbon tetrachloride	Meralgia paraesthetica	
Epidemic (lethargic) encephalitis	Diphtheria	Chronic colitis	Trinitrotoluene		
Erythroedema	Typhoid	Cancer with cachexia	Dinitrobenzene		
Acute rube myelitis	Paratyphoid fever	Tuberculosis with cachexia	Triorthocresyl phosphate		
	Typhus fever	Senility with cachexia	Aniline		
	Influenza	Diabetes	Sulfonethylethane, barbitol		
	Pneumonia	Myxedema	Chloral hydrate, chlorobutanol		
	Malaria	Hematoporphyria	Carbon monoxide		
	Relapsing fever	"Recurrent polyneuritis"	Carbon disulfide		
	Serum sickness	"Chronic progressive polyneuritis"	Thallium		
	Acute enteric fever	Chronic bacillary dysentery	Sulfur		
	Syphilis		Emetine		
			Gold		
			Bismuth		
			Sulfanilamide		

successful in relieving the neuritis of a young man, a worker with refrigerants. The most likely offender in this case was methyl chloride.

Nutritional Deficiency or Metabolism Polyneuritis. There is a long list of diseases in which polyneuritis, when it occurs, is conspicuously related to a lack of proper nutrition. This list is composed chiefly of metabolic and deficiency diseases, which often have a number of clinical features in common. In a presentation of this scope we are concerned chiefly with the neuritis manifestations of patients having any of these diseases.

Evidence is accumulating which indicates that many of the neuritic symptoms listed under various syndromes are clinical variations of one large etiologic group. Since vitamin B₁ will usually relieve the manifestations of the polyneuritis of beriberi, a known dietary deficiency disease, and since it is essential for the integrity of the nervous tissue in general, it seems likely that its absence may play a very important part in the development of neuritis in a number of these diseases in addition to beriberi. Evidence indicates that vitamin B₁ is a useful therapeutic agent in the treatment of "alcoholic" neuritis, with or without pellagra, of the

bedfast may be able to walk within a few weeks. However, the patient quickly reaches a stage beyond which thiamin will not cause further improvement, and residual changes may persist indefinitely.

It is our thought that the initial prompt improvement with thiamin in cases of nutritional deficiency is humoral

VITAMIN B IN YEAST, RICE POLISH, LIVER ETC.
ANTI-NEURITIC AND GROWTH PROMOTING
SUPPOSED SINGLE ENTITY
1897-1919

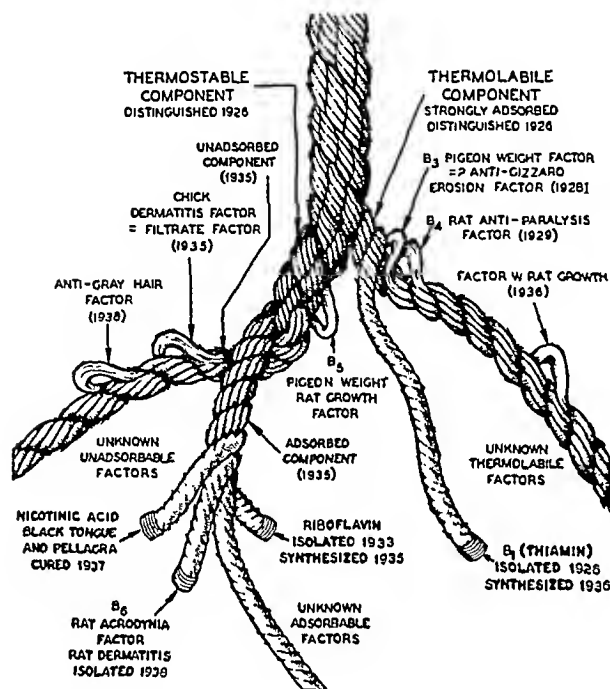


Fig. 1.—Differentiation of the components of the vitamin B complex. The components that have been isolated in a pure state are indicated in heavy lettering; those which have been recognized only by the discrepancies in physiologic properties of various crude extracts are indicated as loops; the possible, still unknown factors are divided into three main strands according to the principle of adsorbability, which has been so useful in differentiation experiments (from Williams and Spies, Vitamin B₁, New York, the Macmillan Company, 1938).

in nature. This impression is furthered by the work of Minz,⁵ who has been able to show that vitamin B₁ enhanced the effect of acetylcholine in the transmission of the nervous impulse. It seems that vitamin B₁ inhibits cholinesterase in the same manner as does physostigmine. In our cases in which this test was performed (in vivo) the serum cholinesterase was inhibited by the administration of thiamin. Glick and Antopol⁶ obtained similar results with horse and rat serum (in vitro), and they made the important observation that the inhibition of the serum cholinesterase was obtained only with concentrations of vitamin B₁ in excess of those known to occur in the living organism.

We have studied the peripheral nerve histologically by the biopsy method in twelve cases of deficiency disease with neuritic symptoms, in several instances both before and months after treatment with crystalline vitamin B₁. In all cases marked loss and degeneration of myelin sheaths was observed in the terminal portions of the internal branch of the anterior tibial nerve

(figs. 2, 3 and 4). The axons in these peripheral nerves have been, on the whole, normal. In cases in which the peripheral nerve was examined as long as eleven months after treatment was instituted, the loss of myelin sheaths was severe.

This study lends support to the hypothesis that the initial spectacular improvement following vitamin B₁ therapy which is experienced by sufferers from nutritional neuritis is on a humoral basis. It also illustrates how slowly restitution of the nerve may occur.

In ten cases of moderate nutritional neuritis the administration of cocarboxylase⁷ (phosphorylated thiamin), 10 mg. in sterile physiologic solution of sodium chloride twice daily by intravenous injection, resulted in the same improvement that had been seen following the use of thiamin. This result supports the hypothesis that vitamin B₁ may be utilized as cocarboxylase by the body.⁸

NICOTINIC ACID TREATMENT OF PELLAGRA

Mental changes as a part of the pellagra syndrome have been recognized by many physicians, and in areas where the disease is endemic these symptoms are so common and so striking that they have become associated with pellagra even by the lay observer. Various abnormal psychic states have been described in medical literature on pellagra, and some writers have thought that one or another psychosis was typical of this disease.

Subclinical pellagrins are noted for the multiplicity of their complaints, among which are many that are usually classified as neurasthenic. The most common of these symptoms are fatigue, insomnia, anorexia, vertigo, burning sensations in various parts of the body, numbness, palpitation, nervousness, a feeling of unrest and anxiety, headache, forgetfulness, apprehension and distractibility. The conduct of the pellagrins may be normal, but he feels incapable of mental or physical effort, even though he may be ambulatory.

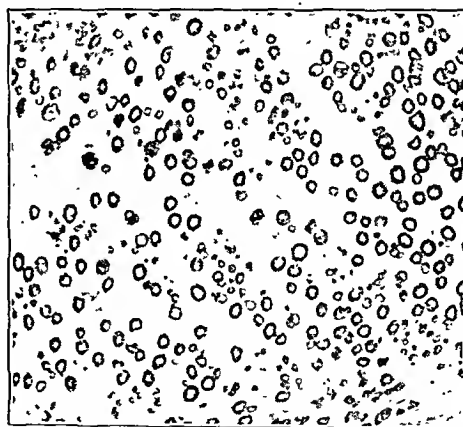


Fig. 2.—Biopsy section of the terminal portion of the internal branch of the normal anterior tibial nerve, stained with fresh 1 per cent osmic acid for from twenty-four to thirty-six hours; X 200. The normal myelin sheaths stain in clear-cut circles.

The noticeable and more serious mental signs of pellagra manifest themselves in various types of psychoses. The most common is perhaps that in which loss of memory, disorientation, confusion and confabulation are predominant. There are also types in which excitement, mania, depression and delirium may occur.

7. Furnished by Merck & Co., Inc.
8. Spies, T. D.; Aring, C. D.; Gelperin, Jules, and Bean, W. B.: The Mental Symptoms of Pellagra, *Am. J. M. Sc.* 196: 461-475 (Oct.) 1938.

5. Minz, Bruno: Le rôle de la vitamine B₁ dans la régulation humorale du système nerveux, *Presse méd.* 46: 1406-1407 (Sept. 21) 1938.

6. Glick, David, and Antopol, William: The Inhibition of Cholinesterase by Thiamin (Vitamin B₁), *J. Pharmacol. & Exper. Therap.* 65: 389-394 (April) 1939.

In our experience a paranoid condition is common in pellagrins. These patients, acting on their paranoid delusions, are more active than are other pellagrins with psychoses.

The acute psychoses of seventy pellagrins have been relieved quickly with the use of nicotinic acid (Spies, Aring, Gelperin and Bean⁹). The psychosis had been present from one to eighty-three days, and the psychosis of ten patients had been induced in the hospital. From 500 to 1,000 mg. of nicotinic acid was administered daily in 50 mg. doses.

The relief of the numerous and varied abnormal mental signs in this group of pellagrins was dramatic in its suddenness and was maintained as long as nicotinic acid or a well balanced diet supplemented with nicotinic acid was administered. In no instance were we unable to relieve the psychosis. Further experience has upheld the efficacy of nicotinic acid in the treatment of this type of patient.

In thirteen cases we were unable to relieve completely the chronic psychosis accompanying pellagra. Large doses (from 500 to 1,000 mg. daily) of nicotinic acid were administered for periods varying from one and one-half to two and one-half months to the pellagrins suffering from chronic psychoses. These patients became more alert, cooperative and tidy, and apathy and restlessness disappeared. Some of them changed from a bedridden to an ambulatory status. However, hallucinations and delusions usually persisted, although an occasional patient gained some insight into his condition.

Several reports (Evans,⁹ Bogart,¹⁰ Frontali and Ferrari¹¹) have appeared on the beneficial effect of nico-

months, were we able to effect anything approaching complete cure. These cases are too few to serve as a basis for a final opinion.

Nicotinic acid was also administered (Spies, Aring, Gelperin and Bean⁹) to a group of 225 mildly affected pellagrins with complete relief of their rather typical



Fig. 4.—Section of the terminal portion of the internal branch of the anterior tibial nerve of a patient with alcoholic neuritis, ten months after thiamin therapy which had been continuous for two months; $\times 1,000$.

complaints, which have usually been considered to be those of neurasthenia. With nicotinic acid therapy the ambulatory pellagrin also regains energy and appetite. This relief occurs from one to twelve days after the administration of from three to six doses, 100 mg. each, of nicotinic acid a day.

(Nicotinic acid has been reported to have been used with benefit in Wernicke's disease [Jolliffe¹²]. Recent experimental work with animals and clinical observations have indicated that the lack of vitamin B₁ may result in Wernicke's disease and that this condition may be relieved by the administration of vitamin B₁.)

COMMENT

Vitamin B probably has been administered to patients suffering from every kind of nervous disease. Like other new medicaments (insulin, liver extract, sulfanilamide), it has been applied in the treatment of many diseases.

As far as the nervous system is concerned, the evidence suggests the following claims for vitamin B₁ to be allowable: It is of value in correcting and preventing beriberi and the neuritis that accompanies this disease; it is of value in the treatment of the neuritis associated with chronic alcoholism, pellagra and pregnancy. There is enough clinical information available

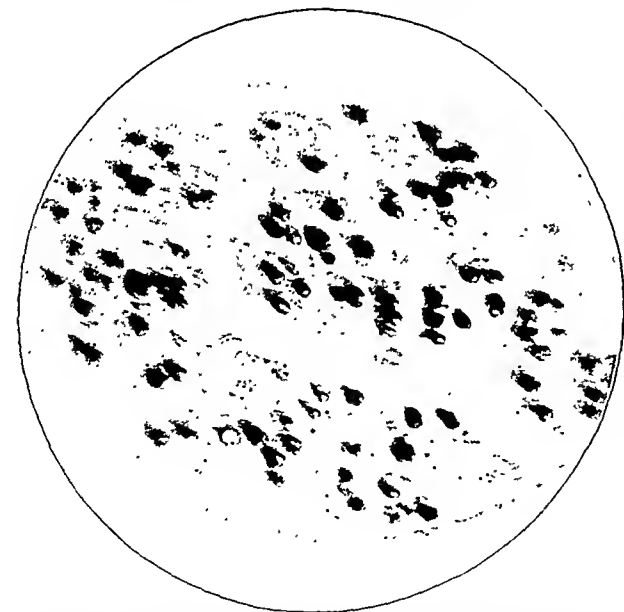


Fig. 3.—Section of the terminal portion of the internal branch of the anterior tibial nerve of a patient with alcoholic neuritis; $\times 1,225$. There is loss of myelin sheaths. The myelin sheaths remaining are not regular in outline. Wide clefts appear in the substance of the bundles.

tinic acid in the psychosis of pellagra. There has been no report of the complete relief of a chronic pellagrous psychosis of many years' duration. For only one patient, who had been in a mental hospital for nine

9. Evans, V. L.: Pellagra with Psychosis and Minimal Physical Symptoms, *J. A. M. A.* **112**: 1249-1250 (April 1) 1939.

10. Bogart, C. N.: Nicotinic Acid in the Treatment of Pellagra, *J. A. M. A.* **111**: 613-614 (Aug. 13) 1938.

11. Frontali, G., and Ferrari, G.: Le forme nervose della pellagra curate con acido nicotinico, *Minerva med.* **2**: 133-148 (Aug. 11) 1938.

12. Jolliffe, N. H.: Alteration of Mental and Emotional Processes by Vitamin Deficiency, read at the meetings of the Association for Research in Nervous and Mental Diseases, New York, Dec. 27-28, 1938.

at the present time to warrant the trial of thiamin for patients who have peripheral neuritis associated with dietary deficiency or undernutrition from any cause. Also a trial is warranted in peripheral neuritis and edema of undetermined origin.

Our experience with six patients suffering from severe pain (carcinoma, cord tumor, brachial and trigeminal neuralgia) was that thiamin administered intravenously in 50 to 100 mg. doses daily over a period of ten days did not act as an analgesic.

We are unable to evaluate the statements in the literature that other neurologic conditions may be improved with the use of vitamin B₁, but it is our belief that this vitamin is useful in the amelioration of these disorders only if they are caused by its deficiency. It is often difficult to make a clinical diagnosis of vitamin B₁ deficiency with any degree of assurance, but this defect may be remedied shortly by the development of simple diagnostic laboratory methods.

SPECIFIC THERAPEUTIC AND PREVENTIVE MEASURES

The vitamin B deficiencies can be greatly decreased by the application of the following recommendations:

1. Fresh foods, such as potatoes, native vegetables, pork and liver, eggs, milk, fruits and especially beans and whole grain cereals should be substituted for or added to a diet of decorticated cereals and dried or canned foods whenever possible.

2. The use of dried yeast, wheat germ, liver, kidney and vitamin B₁ crystals as supplements to the diet should be encouraged whenever possible. The expense of such materials, however, often interferes with their extensive use.

3. Since vitamin B₁ is water soluble, a large amount of it is lost when the water in which the foods are cooked is thrown away. It is recommended, therefore, that the water in which foods containing vitamin B₁ are cooked be used for broths. Whole barley or other grains which are rich in vitamin B₁ may be added to such broths to insure additional protection.

4. The use of undermilled rather than overmilled grains should be rigidly enforced among government troops and in prisons, asylums and other institutions where mass feeding is required. Each lot of grain purchased should be examined to determine whether there is an adequate amount of the germ and of the external layers of the grain. Since molds, weevils and other infestations deprive cereals of this vitamin, one must be certain that the grain has not spoiled.

5. Particular attention should be directed toward the diets of persons with chronic debilitating diseases and increased metabolism, for the incidence of vitamin B₁ deficiency is high among such patients. Alcoholic addiction, pellagra, sprue, pernicious anemia, colitis, diabetes mellitus, tuberculosis, senility, malignant tumor, cirrhosis and other diseases may interfere with the proper nutrition of the patient and thus predispose to the development of vitamin B₁ deficiency.

6. The diets of pregnant and lactating women should be especially rich in vitamin B₁. Whenever there is any doubt as to the adequacy or utilization of this vitamin either in the mother or in the child, supplements should be given. The supplements should be continued both in the mother and in the child until the proper diet is assured. The nursing mother should receive at least 5 mg. of thiamin or its equivalent daily; the infant

should receive 0.5 mg. a day or its equivalent, and children should receive 1 mg. or its equivalent a day.

7. The requirement for vitamin B₁ may be distinctly above the average in persons with fever, severe gastrointestinal symptoms, hyperthyroidism and other conditions. It is essential for the physician to prescribe amounts above the average for such persons. We suggest a maintenance dose, from 5 to 10 mg. of pure vitamin B₁ or its equivalent a day, except when the patient is unable to absorb from the gastrointestinal tract. In such instances it is essential that vitamin B₁ be given parenterally in order to protect the person from a deficiency of this vitamin.

Our experience leads us to believe that if crystalline vitamin B₁ is to be efficacious in any serious nervous disease it must be given in large doses. We recommend the administration of at least 50 to 100 mg. each day, given parenterally in several doses of from 10 to 20 mg. each. It is also our belief that if no response is obtained within a week, further vitamin B₁ therapy will be unavailing. If these dosages result in improvement of the patient, one may be able to carry him along by the oral administration of thiamin, for a complete cure of these diseases takes a long time. A well rounded diet of 4,500 calories should also be given. This diet must be supplemented with vitamin B or with one or more of the following therapeutic agents: dried brewers' yeast (6 ounces [170 Gm.] daily), wheat germ (6 ounces daily) and extract of rice polishings (tikitiki, 3 ounces [85 Gm.] daily).

SPECIFIC NICOTINIC ACID THERAPY

The dietary advice just noted is as applicable to the pellagrin as to patients suffering from the vitamin B₁ deficiencies.

The optimal dosage of nicotinic acid, like that of thiamin, has not been determined. Neither has the minimal dose of nicotinic acid been determined, but it seems to vary from case to case. It is thought that the pellagrin with severe mental symptoms should receive a total of at least 500 mg. per day. This is best administered by mouth in ten equal doses, although it may be administered parenterally. In the extremely severe cases, convalescence may be shortened by the administration of 1,000 mg. daily. We have given as much as 2,000 mg. daily in divided doses without untoward results. There may be some flushing and feeling of warmth in the skin incident to large doses of nicotinic acid.

ABSTRACT OF DISCUSSION

DR. HANS H. REESE, Madison, Wis.: Drs. Aring, Spies and Evans have given a comprehensive clinical survey on the vitamin B deficiencies, based on the experiences of the Cincinnati group. I challenge only the use of the term "neuritis." Wechsler's recommendation to call this neural deficiency a pathologic condition, neuropathy or polyneuropathy should be accepted. The authors stated: "The experimental evidence available tends to show that vitamin B does not play any direct specific role in counteracting the effects of infectious agents"; then again they say: "It is known that the neuritis in certain persons with infectious diseases disappears following the administration of a well balanced diet." I would like to have explained what is considered a well balanced diet for a person with an infectious disease complicated by neuritis. If forty-five million of our population have to exist at present on an annual income of \$980 and some four and one-half million on an annual income of \$98, it should be made known what a well balanced diet or optimal nutrition for normal physiologic function is which will counteract neuritic complications if members of this group get ill. Furthermore, do

the authors believe that chemical neuritides do not require vitamin B₁, in addition to present-day therapeutic procedures? Since vitamin B₁ is said to be essential for the integrity of the nervous tissue in general, and since its absence may play an important part in the development of neuropathy in a number of nutritional deficiency or metabolic disorders, I would appreciate information as to diagnostic, clinical and laboratory criteria for the assumption of antineuritic B₁ deficiency being present. How is a mild state of pellagra differentiated from a psychoneurotic or psychasthenic state? I cannot do it from the authors' given list of complaints. The section on treatment and general principles of treatment contains such clearly defined, instructive and essential nutritional principles that its contents should be made available to every physician.

DR. J. M. NIELSEN, Los Angeles: In 1932 I had under my care a patient with a severe pellagrinous psychosis. I put him on a high meat diet and in about six months he began to recover his mental capacity. One of his symptoms, which I called a delusion, was that he claimed that his hair was turning black. He had had white hair for about thirty-five years, but after his mental capacity returned he still claimed that his hair was turning black. I examined his scalp and the crown of his head was covered with black hair. Last year I had another patient, aged 86, who had cerebral thromboses and was almost moribund. He took a turn for the better, but his diet had become so deficient that clinical pellagra had developed. I put him on nicotinic acid and nothing else. In a month, black hair was growing on his bald head. About two months ago I put a patient who has no dietary deficiency at all but who had been bald for many years on nicotinic acid, and before I left Los Angeles he had a growth of hair over that bald area about three eighths of an inch long. Now, I should like to ask whether there is any definite experimental or clinical evidence to substantiate the idea that nicotinic acid has some capacity for the production of melanin or darkening, particularly the hair in this area, or whether this is all a coincidence.

DR. GEORGE R. COWGILL, New Haven, Conn.: The question was asked as to the relative importance of protein, fat and carbohydrate, on the one hand, and mineral nutrients, on the other hand, in B₁ avitaminosis. What evidence there is indicates that vitamin B₁ functions primarily in relation to carbohydrate metabolism. About 58 per cent of protein can form sugar in the body. It appears that one should separate the "non-fat calories" from the "fat calories," so to speak, in estimating the human requirement for vitamin B₁. Regarding the minerals, work with the Warburg apparatus in studies of oxidation and reduction involving vitamin B₁ shows that a little manganese in the system is important. There have been some suggestions in the literature that manganese may play some role in the functioning of vitamin B₁ in the body. That is just a suggestion as to how some of these minerals may perhaps come into the picture, although it cannot be said very precisely at the moment how they function. Regarding the quantitative relationship of vitamin B₁ to protein, fat and carbohydrate, I might mention that Dr. Arnold of the University of Wisconsin reported at the recent Toronto meeting of the American Society of Biological Chemists something like 75 micrograms of pure vitamin B₁ as being required for the metabolism of 100 Gm. of protein and carbohydrate; that is to say, the "non-fat calories." That would be a specific contribution in answer to this question. Regarding the effect of cholesterol deficiency, so far as I know cholesterol is not a vitamin. By vitamin I mean a substance which the body needs for its own metabolism and which cannot be made within the organism, hence must be supplied from without. Regarding the man whose gray hair turned black, I might mention that studies have been reported on rats fed a diet lacking the "filtrate factor." When black rats were used for the study and were on the diet lacking the filtrate factor, gray hair developed. When the filtrate factor was later supplied the gray hair became black. Dr. Agnes Fay Morgan of the University of California reported at a recent meeting in Toronto that she had confirmed these observations on brown Boston bull terriers and had produced gray hair in such animals. When the filtrate factor is supplied, the pigment returns. I

don't suppose that such experiments explain the appearance of black hair on a human bald head. I think that is perhaps a little bit beyond us at the moment.

DR. RICHARD M. BRICKNER, New York: I would like to ask the authors whether the use of vitamins has brought out any danger symptoms. Are there any cautions to be given in regard to large doses?

DR. CHARLES D. ARING, Cincinnati: In regard to the therapy of the infectious polyneuritides, one rarely sees a case of infectious polyneuritis since the increased interest in nutrition. One does see the neuritis called "Landry's ascending paralysis," or infective neuritis, or acute infectious polyneuritis. I think it can be stated that no benefit is obtained from vitamin therapy in this disease. In fact, as I noted, progress of neurologic symptoms occurs when the patient is receiving vitamin B₁. Whether or not patients having chemical neuritis improve with B₁ therapy is a moot point. In one case of emetic neuritis in which the dietary had been satisfactory prompt improvement was obtained with intravenous vitamin B₁ therapy. However, other cases of chemical neuritis, such as Jamaica ginger paralysis, of which there were a few fresh cases a year or two ago in Cincinnati, did not respond at all to vitamin B₁ therapy. It would be my advice, therefore, that the vitamin be used in these conditions until more information is obtained. As to what constitutes a well balanced diet, it would take too much time to go into this matter, although, as Dr. Reese points out, it is probably the single most important point in this whole discussion. We have described what we think is a well balanced diet in a paper that is to be published. The differential diagnosis between neurasthenia and mild pellagra is a difficult one clinically. As has been said here, the symptoms are similar. There are, however, certain methods of differentiating these conditions. The finding of porphyrins or similar substances in the urine in cases of mild pellagra and the rapid response of the patient to nicotinic acid, which does not occur in the psychoneurotic patient, would make the diagnosis certain. In the differential diagnosis of nutritional neuritis from other types of neuritis, I think probably the most important point would be the history and the progress of the disease. The mechanical, localized types of neuritis are rather simple of diagnosis. Patients who have been exposed to chemicals and other noxious agents usually give the examiner a lead in the history. There are tests such as the Cline method for determining the excretion of thiamin in the urine, which is a procedure not simple enough to be performed in every physician's office. This method of diagnosis is being developed, and there is likely to be a simple chemical method within the near future. One point that might have a bearing on Dr. Nielsen's patients who have grown black hair after the administration of nicotinic acid: Nicotinic acid improves the local circulation in the head and face. In regard to the dangers of overdosage with thiamin or nicotinic acid, there is practically none. We have given as high as 500 mg. of thiamin a day by mouth, and again 500 mg. of thiamin a day intravenously for weeks. We have administered as much as 2,000 mg. of nicotinic acid a day by mouth without any untoward symptoms.

Mitosis.—The usual mechanism of cell division is the rather complicated process of mitosis, but the cells of some tissues (e. g. cartilage cells under certain conditions) are believed to divide occasionally by the simpler method of amitosis, which involves a direct constriction and splitting of the nucleus without any preliminary anatomical changes in the latter. . . . The whole process of mitosis, as seen in tissue cultures, takes from thirty minutes to two or three hours to complete. The duration of mitosis in the living body has been calculated by indirect methods. It has been shown, for example, by correlating the incidence of mitotic figures with the growth rate of the regenerating liver, that in this tissue each mitosis lasts on the average forty-nine minutes. There is evidence to show that under normal conditions of light, there is a twenty-four hour rhythm in the mitotic division of animal cells, a rhythm which is well known to occur in plants. This periodicity is abolished by continuous exposure to light, but not by continuous darkness. —Clark, W. E. Le Gros: *The Tissues of the Body*, London: Oxford University Press, 1939.

DEPRESSED SKULL FRACTURES; VALUE OF SURGERY; SEQUELAE

AN EIGHT YEAR FOLLOW-UP STUDY OF
NINETY-ONE PATIENTS

MARK ALBERT GLASER, M.D.
AND
FREDERICK P. SHAFER, M.D.
LOS ANGELES

The question of elevation of the depressed fragments in depressed fractures of the skull is one that has been debated for many centuries, and even to this day various opinions are held. It has been assumed that if early elevation is not carried out traumatic cysts, scar formation, adhesions or cerebral softening may occur, which clinically can produce manifestations of psychosis, epilepsy, persistent troublesome and debilitating headache, as well as dizziness.

This series of ninety-one cases has been analyzed for the purpose of determining the disability of the entire group, the sequelae responsible for this disability and the effectiveness of early surgery in the prevention of such symptoms.

This group of ninety-one patients has been divided into five classifications, dependent on the various periods of disability (fig. 1). In group A there are thirty-six patients (39.5 per cent) who were disabled for four months or less. Group B, comprising two patients (2.2 per cent), returned to work at the end of a year. Patients in group C had a permanent partial disability. There were twenty-three patients (25.3 per cent) in this division. Group D was composed of those who were permanently and totally disabled; it consisted of eighteen patients (19.8 per cent). There were twelve patients (13.2 per cent) in group E, all of whom died. Seven of the entire group (7.7 per cent) were women.

This classification indicates that if complaints persist beyond the four months period the opportunity for complete recovery is relatively slight. Approximately 20 per cent of these patients were permanently and totally disabled and 13 per cent died. These results show that, in cases of depressed fracture, permanent disability and mortality are considerably higher than in those cases in which the suffering is from concussion or linear fracture.

In the group of patients who were not unconscious following the original accident or else were only momentarily so affected, all recovered within a period of four months, except two who had brain abscess. In those cases in which there was unconsciousness for from five minutes to twelve hours the difference in time was not associated with any corresponding variation in disability. Thirty-four per cent of the five minute to twelve hour group returned to work within four months, whereas about 54 per cent went on to some form of disability; approximately 11 per cent died. In the twelve to forty-eight hour group 44 per cent died, and a similar proportion went on to partial or total permanent disability. Among those who were unconscious for from two to seven days, about 65 per cent developed permanent disability. It is apparent that the period of unconsciousness is definitely related to disability, and the longer the patient has been unconscious the more

chance there is of some form of disability developing. If the patient is not unconscious at all his chances for recovery are extremely good, though there is little difference whether a patient is unconscious for five minutes or for twelve hours. Of the total group of ninety-one patients, 13 per cent were not rendered unconscious following the accident and 9 per cent were only momentarily so affected; 48 per cent suffered from loss of consciousness for from five minutes to twelve hours, 10 per cent from twelve to forty-eight hours and 19 per cent from two to seven days (fig. 5).

As has been previously stated, the purpose of early elevation of depressed fractures has been to prevent development of late symptoms. In this series of cases a correlation of figures 6 and 7 will indicate the results of operative intervention obtained in these cases. In group A, thirty-six patients (39.5 per cent) of the entire series) returned to work within a period of four months or less and have been entirely symptom free up to the present time; twenty-three patients (63.9 per cent) were operated on and thirteen patients (36.1 per cent) were not. This clearly demonstrates that the performance of surgery was not a factor in preventing sequelae, as approximately one third of these patients got along perfectly well without operative intervention. In group B there were two patients (2.2 per cent) of the series; neither was operated on, but they continued to complain of mild headaches and dizziness for a period

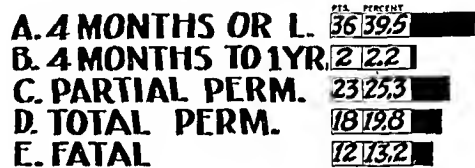


Fig. 1.—Depressed fractures in relation to disability.

of one year. These subjective symptoms then subsided and they were returned to a normal wage earning basis. It is quite evident from these facts that in this group of patients, if complete recovery did not occur within a period of four months, the probability of some form of permanent disability was relatively great. In group C there were twenty-three patients, of whom nineteen, or 82.6 per cent, were operated on. In spite of the fact that the depressions were elevated, these patients developed partial permanent disability. In group D there were eighteen patients, of whom 83.3 per cent were operated on; nevertheless they had total permanent disability. Referring to figure 7, the sequelae may be observed in detail. In addition to these sequelae, the patients complained to a lesser degree of fatigue, insomnia, tinnitus, body pains, transient numbness, staggering gait, anorexia and loss of libido. In group C convulsions occurred in 34.8 per cent of the patients, and in group D in 38.9 per cent. However, in group D extreme psychoses accounted for the disability in 72.2 per cent of the cases, whereas neurologic signs were a minor factor. Subjective complaints of headache, dizziness and nervousness were present in the neighborhood of 50 per cent in both C and D groups but were not necessarily of a disabling nature. All these sequelae except convulsions developed immediately after injury; the psychoses, eliminating the acute psychotic state, of the early part of the injury, showed variations in degree from time to time, while the nervousness frequently increased. The convulsions and psychoses occurred in a much higher proportion than in the series of general

head injuries.²⁶ The sequelae in the entire series, groups A, B, C and D, were as follows: headaches 44.3 per cent, dizziness 30.3 per cent, nervousness 27.8 per cent, convulsions 19 per cent, extreme psychoses 16.4 per cent, involvement of the eighth nerve 13.9 per cent, mild psychoses 10.1 per cent, hemiparesis 8.9 per cent,

A. 4 MONTHS	
OPERATED	23 63.9
NOT OPERATED	13 36.1
B. 1 YEAR	
OPERATED	0 0
NOT OPERATED	2 100
C. PARTIAL PERM.	
OPERATED	19 82.6
NOT OPERATED	4 17.4
D. TOTAL PERM.	
OPERATED	15 83.3
NOT OPERATED	3 16.7
E. FATAL	
OPERATED	5 41.6
NOT OPERATED	7 58.4

Fig. 6.—Surgery in relation to disability: operations performed, sixty-two (68.2 per cent); operations not performed, twenty-nine (31.8 per cent).

involvement of the third, fourth and sixth nerves 7.5 per cent, aphasia 7.5 per cent, involvement of the first nerve 6.3 per cent and of the second nerve 6.3 per cent.

In forty-one cases in which either partial or total permanent disability developed, the main causes for these disabilities were (fig. 8) convulsions and mental disturbances twenty-four patients (58.8 per cent), convulsions alone fifteen (36.5 per cent), psychoses alone

PSYCHOSIS-EX.	
C	0 0
D	13 72.2
DIZZINESS	
C	13 57.0
D	9 50
HEADACHE	
C	12 52.2
D	10 55.6
NERVOUSNESS	
C	12 52.2
D	10 55.6
CONVULSIONS	
C	8 34.8
D	7 38.9
PSYCHOSIS-M.	
C	6 26.1
D	0 0
I.	
C	1 4.3
D	4 22.2
III, IV, VI.	
C	1 4.3
D	4 22.2
APHASIA	
C	4 17.4
D	1 5.6
VIII.	
C	3 13.5
D	3 16.6
HEMIPARESIS	
C	3 13.5
D	3 16.6
II.	
C	1 4.3
D	2 10.6

Fig. 7.—Sequelae in relation to disability.

thirteen (31.7 per cent), postconcussion syndrome, aggravated by a mild neurosis in some instances, ten (24.8 per cent), neurologic signs consisting of blindness in three instances and paresis in one (9.8 per cent), and a severe post-traumatic neurosis in three (7.3 per cent).

The development of a post-traumatic neurosis must not be overlooked in cases of head injury. This may be caused by maladjustments in the emotional realm, financial difficulties, family troubles, antagonism to physician or insurance carrier and dissatisfaction of various and sundry forms.²⁷ From the industrial standpoint, as well as for the good of the patient, when a post-traumatic neurosis develops and constitutes the main disabling factor present its early recognition is paramount. The cause of the condition must be ascertained and adjusted if possible. Medical care itself is of little avail when finances or antagonism are responsible. In such instances a financial settlement is the best means of solving the problem.

Convulsions occurred in fifteen cases, which is 16 per cent of the entire series. This is a very high percentage of convulsive states following brain trauma as compared to 3.3 per cent reported by us²⁸ previously in general head injuries. This indicates that depressed skull fractures are exceptionally prone to convulsive states.

Post-traumatic psychosis occurred in thirteen cases to a severe degree and in six cases to a mild degree. In the psychoses there was a complete reversal of personality associated with unreasonable attitude, irresponsibility, unreliability, periodic tantrums or mania. The patients were emotionally unstable, morose, restless

CONVULSIONS AND PSYCHOSES	
C	24 58.8
D	15 36.5
CONVULSIONS	
C	13 31.7
PSYCHOSES	
C	10 24.8
POST-CONCUSSION SYNDROME	
C	4 9.8
NEUROLOGICAL SIGNS	
C	3 7.3
POST-TRAUMATIC NEUROSIS	
C	3 7.3

Fig. 8.—Chief causes of permanent disability (forty-one patients).

and unable to adapt themselves to their former occupations. Occasionally this became so severe that they were necessarily confined to a sanatorium. Memory and judgment were often impaired, and restlessness and confusion or moodiness existed.

The abnormalities found on vestibular tests have previously been reported.²⁹

SEQUELAE

It is very evident that early elevation did not prevent the development of sequelae in this series; this corresponds to an experimental observation reported by Naffziger and Glaser in 1930.³⁰ These experiments indicated that the force of the blow struck was responsible for the underlying damage to the brain in simple depressed fractures, and the pathologic condition was not due to a rounded depression of bone pressing on the brain. Elevation should be confined to fractures of a fragmented and spiculated nature wherein the dura has been perforated and the brain traumatized or when the depression is over functioning cortical areas. It is very difficult to lay down a hard and fast rule as to the type of case which does not require elevation, because frequently even by careful radiologic examination we are unable to judge when the dura has been lacerated and the underlying cortex injured. Each case is a problem in itself and requires the personal

26. Glaser, M. A., and Shafer, F. P.: Epilepsy Secondary to Head Injury, *Arch. Surg.* 30:783 (May) 1935.

27. Glaser, M. A., and Anderson, F. N.: Psychoneuroses Secondary to Head Injuries, *Am. J. Surg.* 24:210 (Aug.) 1933.

28. Glaser, M. A., and Shafer, F. P.: Skull and Brain Trauma: Their Sequelae, *J. A. M. A.* 98:271 (Jan. 23) 1932.

29. Glaser, M. A.: The Cause of Dizziness in Head Injuries: A Vestibular Test Study in 66 Patients, *Ann. Otol., Rhin. & Laryng.* 46:387 (June) 1937.

30. Naffziger, H. C., and Glaser, M. A.: An Experimental Study of the Effects of Depressed Fractures of the Skull, *Surg., Gynec. & Obst.* 51:17-30 (July) 1930.

judgment of the surgeon. Immediate elevation is definitely unimportant (figs. 12 and 14). Shock, intracranial pressure, hemorrhage and associated injuries must be considered first. Only when a patient is in good condition is the operation indicated, and it should never be performed without an x-ray examination. The final objective in the operative treatment of a depressed fracture is to renew the depression and repair the cranial defect. When infection is not present the fragments of bone may be replaced. In cases in which a possibility of infection exists, or when the patient has been seen several days after the injury or it is necessary to delay surgery several days, primary wound suture may be carried out as the only immediate operation; then at a later date the depression may be elevated and the bony fragments utilized for repair of the skull. By this means a sterile field is insured for the secondary operation.

The surgeon who favors early elevation in all cases of depressed fracture because he believes that this will prevent the onset of sequelae and is of the opinion that sequelae may be caused by the pressure of bone on the brain should similarly believe that elevation of late fractures is indicated in all instances. This argument could be supported by the theory that continued pressure of bone on the brain will cause further damage and consequently elevation should be carried out at any time with or without symptoms. However, our clinical and experimental data do not justify such conclusions. For this reason we do not favor the early elevation of all depressed fractures, and we definitely do not believe that symptom-free late depressed fractures should be operated on in any instance; further, we



Fig. 9.—Encephalogram of patient with convulsions due to a cyst. Note ventricular changes, cyst and bone defects.

believe that exploration should not be done in cases of cranial defect of long standing and without symptoms for the purpose of preventing later cerebral complaints.

In cases presenting symptoms seen at a late date in which the depression is not elevated, it must be determined whether the symptoms are to be attributed to the injury. In those presenting a post-traumatic neurosis no surgery of any type is performed. In cases of a postconcussion syndrome, with predominating head-

aches and dizziness, the question of encephalography is seriously contemplated, as it must be remembered that this procedure in many instances relieves the headaches and dizziness.³¹ Post-traumatic epilepsy always begins at a late date, and each patient should have an encephalogram performed. Encephalography, plus the use of sedatives in a number of instances, in our

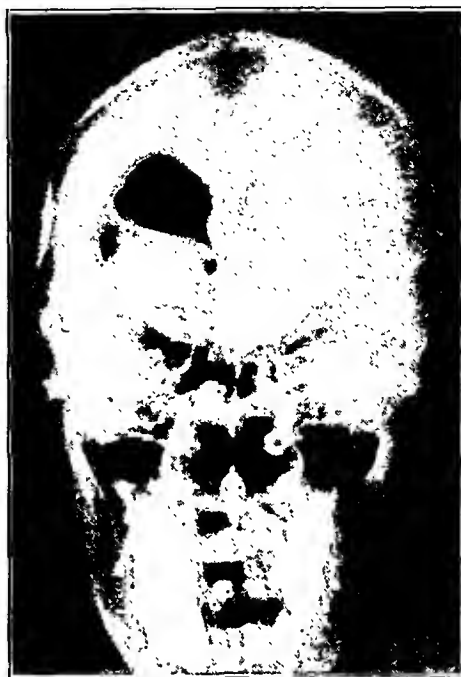


Fig. 10.—Patient with birth injury twenty-four years before suddenly had convulsions. The depressed area is still apparent and the ventricles are dilated, unequal and shifted; cortical air is absent.

series has relieved convulsions, whereas previous to the encephalogram sedatives were not effective. Depending on the encephalographic diagnosis of cysts, adhesions, ventricular distortion or shifts, surgery may or may not be carried out.³² Little or nothing can be accomplished in the line of surgery for the post-traumatic psychosis. However, an encephalogram will give added information as to the underlying cerebral pathologic condition causing these mental changes. The same type of medical conduct is followed in cases of cranial defects plus symptoms, as in cases in which the bone has not been elevated.

PROCEDURES

A number of methods have been advocated for elevating and removing the depressed portion of bone. In the majority of instances the fragments are badly shattered, depressed and impacted, so that it is quite easy to start the removal of bone by lifting out a single piece, with the aid of a rongeur or elevator. Occasionally it may be necessary to start the elevation by the use of a perforator. All depressed fragments should be removed and the edges of the fracture carefully

31. Carpenter, E. R.: Surgical Treatment of Chronic Headache and Pain in the Head, *Southwestern Med.* 10:61 (Feb.) 1926. Penfield, Wilder: Chronic Meningeal (Post Traumatic) Headache and Its Specific Treatment by Lumbar Air Insufflation, *Encephalography, Surg., Gynec. & Obst.* 45:747 (Dec.) 1927. Gardner, W. J.: The Therapeutic Effects of Encephalography, *Pennsylvania M. J.* 33:126 (Dec.) 1929. Boyd, Douglas: Post-Traumatic Headache Treated by Spinal Insufflation of Air, *Arch. Surg.* 18:1626 (April) 1929.

32. Foerster, O.: Die Pathogenese des epileptischen Krampfanfalles, *Deutsche Ztschr. f. Nervenh.* 94:15, 1926. Penfield, Wilder: Mechanism of Cicatricial Contraction in the Brain, *Brain* 50:499 (Oct.) 1927. Wortis, S. B.: Head Injuries: Effects and Their Appraisal; Experimental Studies of Induced Convulsions and Ventricular Distortion in the Cat, *Arch. Neurol. & Psychiat.* 27:775 (April) 1932.

inspected to make certain that any spicules which may have penetrated the dura and injured the brain are not left in situ. By this method the entire underlying dura may be properly inspected and the fragments utilized in the restoration of the skull. The application of a catgut screen for bone replacement will be considered in detail later. The use of an elevator alone,

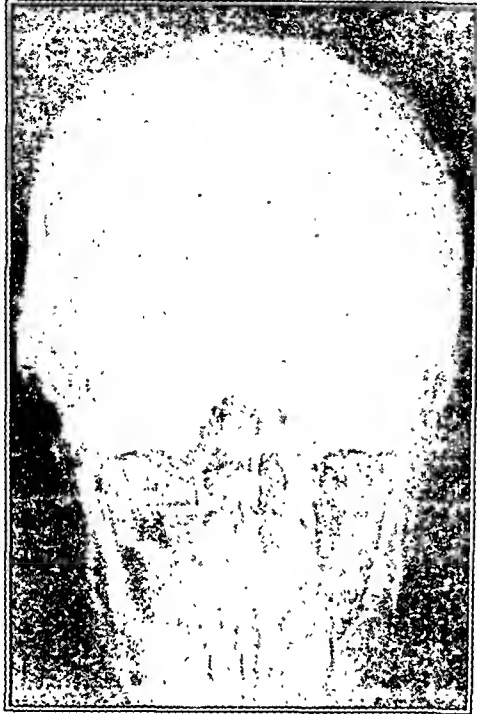


Fig. 12.—Same patient as in figure 11 two years later; note the difference in the depressed portion.

introduced through a small opening with a prying up of the fragments, does not permit inspection of the dura and for this reason is not advisable. It has been suggested that in small depressions a trephine be utilized to remove the entire fragment. The button of bone thus separated may be replaced, thereby elevating the fracture and restoring the bone in one procedure. This method is applicable in only a few instances but proves quite effective when it can be used. In certain instances of compound fracture it has been advised that the area of depression be resected, leaving a wide margin around the broken bone so as to prevent infection of the underlying brain and maintain a sterile field. Since the whole wound is potentially infected in such instances, it is questionable whether asepsis can be maintained. The turning down of a bone flap around the area of depression with the hammering out of the central depressed fragments and replacement of the flap is quite a formidable procedure when restoration can be obtained with more simple means. In addition, the whole principle is defeated should the central bony fragments break away from the bone flap.

The surgery of the dura may be divided into two parts: first, the question of opening the dura when it has not been lacerated and, second, the repair of the dura when it has been lacerated. Peet² is of the opinion that the dura should be opened and the underlying brain inspected. It is his belief that the existence of traumatized or devitalized brain has a destructive action on the adjacent normal brain, and by the removal of the devitalized brain tissue the normal brain is protected from further danger and a vicious circle is pre-

vented; softening does not occur, with the result that the brain injury is materially reduced. Gross, Furlow and Sachs do not favor the opening of an uninjured dura. In our own cases we did not open the dura to inspect the underlying brain except when there seemed some probability that hemorrhage or increased pressure was present.

In cases in which the dura was lacerated the traumatized edges were trimmed, and when the dura could be sutured this procedure was carried out. In cases in which the dura cannot be approximated, the question of a dural graft must be considered. Various reasons have been advocated for the use of grafts, and this question at the present time is one of surgical debate. It is believed by some that a dural graft is entirely unnecessary and at times may even be harmful because of a foreign body reaction, which would aid the formation of excessive adhesions. Those who favor the dural graft believe that it is valuable because it prevents the rough edges of the bone from irritating the underlying brain, thus obviating the formation of surface adhesions; also it forms a water-tight closure of the brain and hence opposes the entrance of infection; it hinders or makes impossible the production of a brain fungus should the intracranial pressure rise from any cause, and, finally, since it makes a definite layer over the surface of the brain so as to permit the insertion of bone fragments.³³

Experimental studies carried out indicate that the use of a graft just to close the dura is entirely unnecessary since the dura will repair itself, the new cells arising from the edges of the dura and from the overlying fascia and muscle. Should it be necessary to insert a graft, animal membrane has proved just as efficient as an autoplasmic graft taken from the fascia lata or the temporal fascia. Further, it has been demonstrated that the heteroplastic graft of animal membrane is entirely absorbed within twelve months, both experimentally and clinically. The use of a dural graft is entirely dependent in each individual case and when utilized is efficient and harmless. All devitalized brain should be removed by dissection and suction, and deeply embedded bone should be extirpated.

It is best to repair the cranial defect immediately at the time of elevation, if this is possible. In wounds

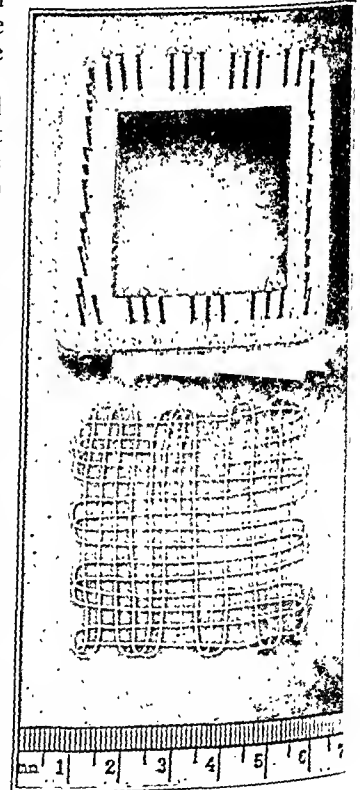


Fig. 13.—Weaving board with catgut woven into a screen.

33. Glaser, M. A., and Thielen, C. H.: Dural Defects: How Important Is Their Surgical Repair? *California & West. Med.* 49:463 (March) 1938.

of a compound nature which are potentially infected, primary suture may facilitate a healing of the wound so that the fragments may be utilized at a later date. The small pieces of bone can be fitted into a mosaic pattern and the entire defect closed. Frequently it is difficult to replace all the fragments of bone and completely cover the defect. It is necessary for all the



Fig. 14.—Particles of bone inserted at time of operation. Note the filling in of defect.

space to be filled with either small particles of bone or bone dust so as to obtain a complete fill of the defect. In order to keep the small fragments in place, a catgut screen may be woven, the catgut sterilized and sutured to the periosteum over the small fragments, thus keeping them in place while the scalp is sutured (fig. 13). This promotes complete ossification of the defect (fig. 14). Cranial defects never fill in, the aperture never grows smaller and the only change that occurs is a smoothing of the sharp borders around the edges of the bone (no infants in series).³⁴ These defects are closed for cosmetic purposes, as a matter of protection, to remove the psychic effect associated by this absent bone and to prevent the pressure sensations and early morning bulging, as well as the feeling of cerebral pulsation. The employment of artificial substitutes, such as silver, vulcanite, aluminum, ivory, celluloid and rubber, has been advocated by Elsberg Mitchell, Erdheim and Pringle.³⁵ The use of heterogenous bone from animals, birds or autopsy material has been suggested by Babcock and Pankratiev. Homoplastic transplants have been taken from the tibia, rib, scapula, ilium and the like (Bagley Breninger, Jones, McWilliams, Primrose, Rhodes, Lexer, Dambrin, Juvara). However, it is the general consensus that osteoperiosteal grafts taken from the adjoining area of the skull are easy to obtain and the results are excellent (Wagner, Frazier, Coleman, Gurdjian, Peet).

In our own series, the osteoperiosteal graft has proved unusually satisfactory. Roentgenograms taken a short time after the graft has been placed reveal the absence

of calcium deposit within the graft. However, at a later date islands of bone will become visible, and finally the entire defect gradually becomes smaller, filling in from the edges (fig. 15 and 16). On palpation this area is firm and solid to the touch.

CONCLUSIONS

1. Surgery does not always prevent the development of sequelae because of the existing brain damage associated with the depressed bone.

2. Recovery from depressed fractures occurs without operation in properly selected cases.

3. The sequelae that develop are convulsions, psychoses, headaches, dizziness, nervousness, aphasia, hemiparesis and involvement of the first, second, third, fourth, sixth and eighth cranial nerves.

4. If the patient does not return to work within the first four months, the probability of partial or total permanent disability developing is great.

5. In simple depressed fractures clinical and experimental evidence indicate that the pathologic condition is caused by the original blow struck and not by any irritation of the overlying depressed portion of bone.

6. Injuries resulting from automobile accidents were the most severe; fractures were more frequent in the frontal and parietal bones; fractures in the young and the old were the most serious; 7.7 per cent of the cases were in women.

7. Patients who were not rendered unconscious recovered within four months; those who were unconscious for from five to twelve hours developed approximately the same disability; but, after the twelve hour period, the longer they were unconscious, the greater was the final disability.

8. Early elevation should be confined to fractures of a fragmented or spiculated nature wherein the dura

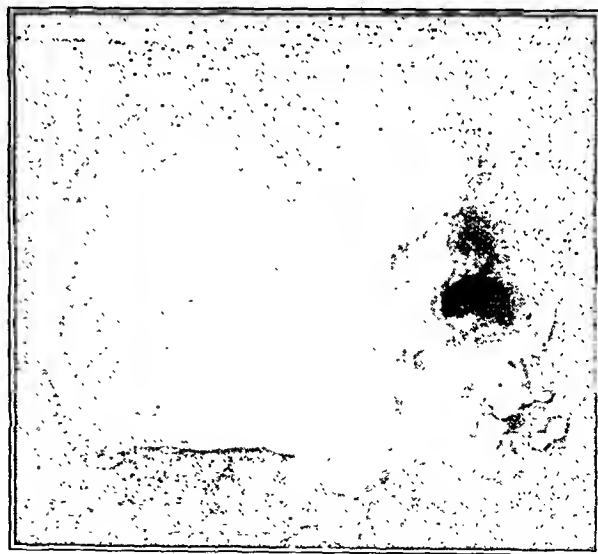


Fig. 16.—Osteoperiosteal graft inserted. Note closure of the defect three years later.

has been perforated or when the depression is over functioning cortical areas. No hard and fast rule can be laid down for the type of depression to elevate, but, bearing the principles in mind that simple depressions are not harmful, the penetration of the dura cannot always be determined by x-ray examination; personal judgment is essential. Operation should carry no mortality.

34. Glaser, M. A., and Blaine, E. S.: Duration of Fractures and Operative Defects of the Skull (As Revealed by Roentgenograms), *J. A. M. A.* 107: 21-24 (July 4) 1936.
35. Pringle, J. H.: Treatment of Acquired Defects of the Skull, *Brit. M. J.* 2: 1105-1107 (Dec. 4) 1937.

9. A badly lacerated wound may be converted into a closed wound by primary suture to conserve the underlying bone and delay early formidable surgery.

10. Patients with late depressed fractures or cranial defects without symptoms should not be operated on.

11. Patients with late depressed fractures or cranial defects, with certain symptoms, should have encephalograms performed and surgery if necessary.

12. Cranial defects never heal spontaneously (no infants in series). At the time of elevation, the use of a catgut screen to hold small fragments of bone in place insures complete ossification of the defect. Late defects are best treated by an osteoperiosteal graft.

ABSTRACT OF DISCUSSION

DR. JOHN H. POWERS, Cooperstown, N. Y.: A number of depressed fractures of the skull are seen in a rural area due almost entirely to the automobile or a kick in the head by an animal. Some of these are exceedingly severe, and three were responsible for deaths in my series of farm accidents. In a rather limited experience I have relied on certain rules in the treatment of depressed fractures of the skull. I feel that any depressed fracture involving both the outer and inner tables overlying the motor area, in which there is even a suspicion of pressure on the dura, should be explored and the fragments elevated. These patients later on are prone to develop sequelae from such depressed fractures over the motor center. Furthermore, I think that every compound fracture of the skull, whether depressed or not, should be operated on, the edges of the wound being extensively debrided and if possible approximated thereafter. If it is impossible to close the wound, it must be allowed to granulate. I was not quite clear as to the relationship of the sequelae, particularly convulsions, in patients operated on and those not operated on. I was particularly interested in the authors' description of the method of treating defects in the skull. I feel that a small defect is of no significance. I am under the impression that in children such small defects may decrease in size over a period of years.

DR. MARK A. GLASER, Los Angeles: In reference to the elevation of a simple nonspiculated depressed fracture of the skull certain fundamental principles must be borne in mind. First, the experimental work has indicated that the blow struck is responsible for the underlying pathologic condition, and not the rounded depression of bone. Second, sequelae developed in 83 per cent of the cases in which operation was performed. While in group A sequelae developed in only 38 per cent of the cases, no operation was performed. From these experimental and clinical results it is evident that fundamentally it is the blow that causes the damage and not the rounded depression of bone and further surgery does not necessarily prevent sequelae. In cases of simple rounded depressed fractures without spiculation or fragmentation of the inner table which would indicate penetration of the dura and over nonfunctional cortical areas we do not favor elevation. Frequently in compound fractures the original wound is sutured and at a later date the bone is handled. In this manner the skull may be conserved without any danger of infection and the fragments replaced so as to prevent a cranial defect. In certain cases in which the question of elevation is a matter of doubt it is always best to carry out the procedure and in all instances the personal judgment of the surgeon in charge is all important. In children when the bones of the skull have become calcified the aperture of the cranial defect does not decrease in size. This has been previously reported by Dr. Blaine and myself. It is true that in children linear fractures may disappear within six months or so whereas in adults they have been found visible as long as seven years later. However, in some instances they have disappeared in eighteen months. The primary treatment of depressed fractures is to consider the brain damage, and the secondary treatment is to restore the skull. When the defects are seen at a late date it is frequently necessary to repair the skull because of the fear of the patients and the subjective symptoms that occur with this defect. In my experience an osteoplastic flap is most satisfactory.

THE REACTION OF THE CORONARY VESSELS TO DRUGS AND OTHER SUBSTANCES

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AND

ERNA LINDNER, B.S.

CHICAGO

A great deal of confusion exists concerning the reactions of the coronary blood vessels to many products of metabolic origin and to numerous drugs. The prevailing contradictions regarding the reaction of the coronary vessels arise from the circumstances under which the measurements have been made, the indirectness of the methods used in some studies and the abnormality of the conditions in others. We have become concerned with this problem and have developed a method by which the action of various drugs and other substances directly on the smooth muscle of the coronary vessels can be determined without at the same time being altered by the other factors which indirectly affect the rate of coronary flow. Our method, which employs a normal denervated dog's coronary vessels perfused in situ with defibrinated dog's blood, permits a direct determination of whether a substance has a vasodilator or a vasoconstrictor action on the coronary vessels.

It must be emphasized that besides its effect in actively altering the caliber of coronary vessels a drug may also passively change the coronary caliber by its other actions. Hence coronary vasodilatation and coronary vasoconstriction are not necessarily accompanied by the expected changes in coronary flow in the intact animal and in man. Further, for practical purposes the important thing is not whether the substance has a coronary vasodilator or vasoconstrictor action nor whether the substance increases coronary flow or decreases it but rather how it influences the relation of the change in coronary flow to the alteration in the work of the heart and to the energy cost on the part of the heart in doing this work. A drug that dilates the coronary vessels actively and that increases the coronary flow may still be valueless or even harmful if it has a disproportionately greater augmenting action on the energy cost and work of the heart. It is the change in the ratio of coronary caliber and coronary flow to the work and energy expenditure of the heart that is the important criterion in determining the value of a drug. To evaluate the merit of a drug properly a knowledge of its action (1) on the active coronary caliber changes, (2) on the total coronary flow and (3) on the work and energy expenditure of the heart is necessary. In this report we deal with our results on the first of these factors. Studies are now in progress to determine the effects on the other two.

The passive factors controlling coronary caliber play an important role in determining coronary flow. For example, the pressure fluctuations in the aorta are of prime importance. In estimating their effects it is not enough to know just the mean pressure but also the cyclic alterations between the systolic and diastolic pressures. Likewise we have shown that the pressures existing in the cavities of the heart and the tension developed within the walls of the heart chambers pro-

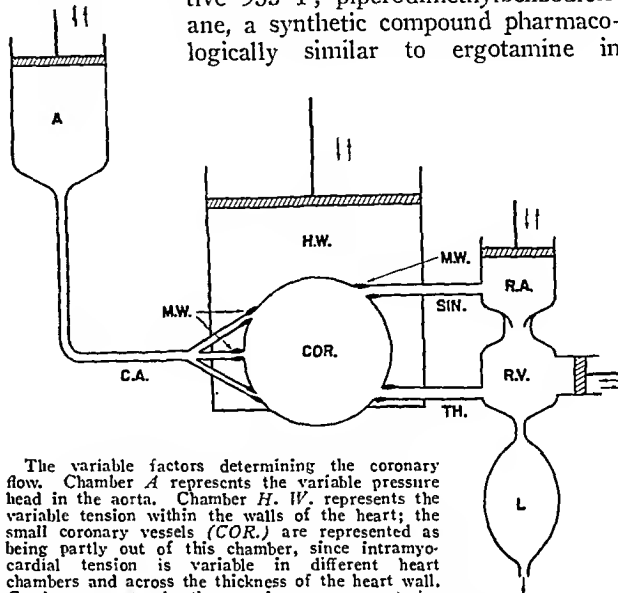
From the Cardiovascular Department, Michael Reese Hospital.
Read before the Section on Pharmacology and Therapeutics at the
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and of the National Research Council.

foundly alter the coronary flow.¹ Drugs may produce their action on coronary flow indirectly by affecting these factors rather than by a direct action on the smooth muscles of the coronary vessels, or these side actions may counterbalance the direct action.

Another serious error in measuring coronary flow is the use of the coronary sinus drainage as an index of coronary vasoconstriction or vasodilatation. The coronary sinus is only one of the drainage channels of the coronary system, the others being the thebesian veins, which empty directly into the heart cavities, chiefly on the right side. We have shown² that the coronary sinus flow is a variable proportion of the total coronary flow and that therefore it is not a reliable measure of coronary vasoconstriction and vasodilatation. Coronary sinus flow changes may represent alterations in the partition of coronary drainage between it and the thebesian channels rather than the changes in total coronary flow. An idea of the complexities of the factors governing coronary flow may be obtained from the accompanying diagram.

We have recently developed a method of perfusing the dog's coronary system³ in which the perfusion pressure was maintained constant (at about 120 mm. of mercury) throughout the experiment and in which the intramyocardial tensions and intracardiac pressures were kept constant (at atmospheric pressure) by throwing the ventricles and auricles into fibrillation and keeping the heart cavities open to the outside. We have shown that the incoordinate action of fibrillation is without effect on coronary flow when the heart chambers are open to atmosphere.⁴ The coronary flow in our studies was determined by measuring either the total inflow into the coronary arteries or the total coronary outflow leaving the pulmonary artery. In the latter case the error involved in ignoring the thebesian flow into the left heart is negligible.² In this preparation, therefore, a decrease or increase in coronary flow, as measured, can result only from an active decrease or increase,

Epinephrine⁵ in all doses used caused the coronaries to dilate, indicating an active diminution in coronary vascular tone. On occasion, transient constriction preceded the dilatation. Ergotamine tartrate occasionally caused constriction but had no effect on the coronary dilatory reaction to epinephrine. The dioxane derivative 933 F, piperodimethylbenzodioxane, a synthetic compound pharmacologically similar to ergotamine in



The variable factors determining the coronary flow. Chamber *A* represents the variable pressure head in the aorta. Chamber *H. W.* represents the variable tension within the walls of the heart; the small coronary vessels (*COR.*) are represented as being partly out of this chamber, since intramyocardial tension is variable in different heart chambers and across the thickness of the heart wall. *C. A.* represents the three major coronary arteries which lie partly in and partly outside the myocardium. *SIN.* and *TH.* represent the drainage channels; the former is the coronary sinus, the latter the thebesian channels. They are shown to empty into chambers *R. A.* and *R. V.*, the right auricle and ventricle respectively; both of these are represented as variable pressure chambers. (For simplicity, the drainage up to 10 per cent by the thebesian channels into the left heart and the considerable thebesian drainage into the right auricle are not shown.) The smooth muscle of the coronary vessels, which represents the site where active vasodilatation and vasoconstriction occur, is indicated by the thickenings *M. W.* *L* represents the pulmonary circuit.

Coronary Vasodilator and Vasoconstrictor Drugs and Substances Based on Observations on the Isolated Fibrillating Dog Heart

Coronary Vasodilator Drugs and Substances

Epinephrine (at times preceded by mild transitory adrenergic constriction)
Acetylcholine derivatives (cholinergic)
Calcium chloride
Sodium chloride
Potassium chloride (when less than 1½ of normal blood concentration)
Glyceryl trinitrate and sodium nitrite
Histamine
Caffeine, aminophylline and other xanthines
Diffusible substances liberated in myocardial ischemia

Coronary Vasoconstrictor Drugs and Substances

Ergotamine (only at times)
Piperodimethylbenzodioxane
Potassium chloride (when greater than 1½ of normal blood concentration)
Pitresin
Atropine sulfate (mild)
Substance in defibrinated foreign species blood

respectively, in the caliber of the coronary vessel, i. e. vasoconstriction and vasodilatation.

Using this method, we have studied the action of a variety of drugs, salts, bloods of foreign species and temporary coronary ischemia on the tone of the coronary vessels of the dog. The principal effects discussed in this report are summarized in the table.

1. Katz, L. N.; Jochim, K., and Bohning, A.: *Am. J. Physiol.* **122**: 236 (April) 1938.
2. Katz, L. N.; Jochim, K., and Weinstein, W.: *Am. J. Physiol.* **122**: 252 (April) 1938.
3. Katz, L. N.; Lindner, E.; Weinstein, W.; Abramson, D. I., and Jochim, K.: *Arch. internat. de pharmacodyn. et de therap.* **59**: 399 (Aug. 31) 1938.
4. Katz, L. N., and Lindner, E.: *Am. J. Physiol.* **124**: 155 (Oct.) 1938.

that it inhibits sympathetic vasoconstriction, produced an increase in coronary tone and abolished the preliminary constriction caused by epinephrine, leaving the dilator response of epinephrine unaltered. The increase in coronary flow, definitely established to occur in the normal unanesthetized dog,⁵ is probably due to a large extent to this active coronary vasodilatation. Assuming, on the basis of experimental evidence, that the dog is closely representative of the human being in this regard, it would appear that coronary dilatation is the more usual response to epinephrine in man. When constriction does occur, it is probably only a mild preliminary to a more marked and persistent dilatation.

Dilatation was the only effect noted with all doses of either acetylcholine or mecholyl (acetyl-β-methylcholine).³ The degree of dilatation was dependent on the strength of the dose. Ergotamine and piperodimethylbenzodioxane had no effect on the action of these two drugs. Atropine, however, completely abolished or diminished these responses. Physostigmine, known to accentuate acetylcholine vascular responses elsewhere, antagonized this inhibitory action of atropine. Thus it appears that the initial constricting action of epinephrine and the persistent dilating action of the choline derivatives on the dog's coronary vessels are correspondingly adrenergic and cholinergic, since they are abolished by piperodimethylbenzodioxane and atropine, respectively. This is in accord with our studies on the innervation of the coronary vessels,⁶ in

5. Essex, H. E.; Herrick, J. F.; Baldes, E. J., and Mann, F. C.: *Am. J. Physiol.* **117**: 271 (Oct.) 1936.

6. Katz, L. N., and Jochim, K.: *Am. J. Physiol.* **126**: 395 (June) 1939.

which, contrary to many investigators, we obtained in this preparation only dilator effects from stimulation of the vagi and both dilator and constrictor effects from stimulation of the sympathetic nerves.

Glyceryl trinitrate (nitroglycerin), sodium nitrite, histamine and caffeine caused marked and persistent coronary dilatation. Some of the other xanthine derivatives (aminophylline, theophylline and the like) produced a similar but weaker effect.³ On the other hand, pitressin caused a very powerful constriction, which continued for a half an hour or more without appreciably lessening in degree.³ Our results on digitalis are as yet incomplete but they show that in large doses approaching the toxic level a constricting action occurs.

Sodium and calcium chloride produce definite dilatation, the latter giving a more pronounced and longer lasting effect.⁴ Potassium chloride had a variable action depending on the concentration used.⁴ Thus, doses up to one and two-thirds times the amount normally found in defibrinated dog blood produced dilatation, whereas doses from one and one-half to two and one-half times the normal concentration produced constriction, at times almost to the point of complete closure. In view of the fact that the potassium content of the blood has been found⁷ to increase from 50 to 100 per cent in the circulatory collapse produced by hemorrhage, shock and adrenal cortical insufficiency, it is not improbable that the excess of potassium contributes in these conditions to the circulatory failure by its constricting action on the coronary vessels.

Defibrinated whole blood of sheep, beef and pig caused a marked coronary constriction.⁸ This reaction must be due to a coronary constrictor substance in the blood of a foreign species and not, as has been suggested, to histamine, which in the dog causes coronary dilatation.³ There was a superficial resemblance to an anaphylactoid reaction in that the coronary vessels of the intact animal could be desensitized to this substance by preliminary repeated injections of the same blood in increasing amounts.

We have confirmed the fact that cardiac ischemia leads to a reactive hyperemia in that temporary stoppage of the coronary flow is followed by a noticeable coronary dilatation.⁹ The dilatation appears to be due to the destruction of nondiffusible substances or to the accumulation of diffusible metabolites which normally are either nondiffusible or in some way destroyed or modified when oxygen is present. These effects of temporary coronary occlusion suggest that there exists in the heart an efficient mechanism which, by producing coronary dilatation, operates to maintain this organ in a normal state by increasing its blood supply whenever myocardial needs are not met by the existing coronary flow. Such a lack of balance between myocardial needs and coronary blood supply can occur under any one or any combination of the following circumstances: (1) when the blood supplying the heart is of poor quality, (2) when cardiac work suddenly increases out of proportion to coronary flow augmentation, and (3) when there is a primary inadequacy of coronary flow, the result of coronary narrowing or occlusion.

Since the heart is extraordinarily susceptible to relative anoxemia and ischemia¹⁰ and, further, cannot

pause for long periods in order to recover from handicaps as can other organs of the body, reactive hyperemia must be viewed as a very important mechanism for maintaining cardiac function. Interestingly, cardiac ischemia, while leading to coronary dilatation, in man often also results in angina pectoris. Because of his pain, the patient is compelled to slacken his activities and hence reduce the work demanded of his heart, thereby tending to bring into closer balance his myocardial needs and blood supply. It is quite probable that coronary vasomotor reflexes and humoral mechanisms may be brought into play to assist this local dilatatory compensatory mechanism, but our knowledge concerning this is still far from complete.

The occurrence of powerful constriction in the coronary vessels following ergotamine, piperidomethylbenzodioxane and especially potassium, pitressin and the blood of foreign species suggests the possibility that coronary spasm can and may occur in man. Our results further suggest that under such circumstances calcium may prove of real therapeutic value by decreasing the tone of the coronary arteries. We make the latter suggestion advisedly, however, for, in spite of the consistency with which calcium chloride increased coronary flow in our experiments, this salt is known to augment the strength of the heart beat and also to render the heart, especially when it is depressed, hyperirritable, and thus may lead to ectopic rhythms. Obviously, before calcium can be used therapeutically with safety, evidence must be procured which establishes that its enhancement of cardiac activity is more than compensated for by its coronary vascular action, and the conditions under which its administration becomes hazardous must be more clearly defined.

Following along the line of thought of improving the balance between the work of the heart and the coronary circulation, a few comments regarding the action of epinephrine are pertinent. In spite of the evidence pointing toward improvement of coronary flow, presumably due in large part to active coronary dilatation, angina pectoris in man is known to be precipitated by this drug. It is quite possible that such attacks are the result of a disproportionately greater increase in the work and energy consumption of the heart than in the coronary flow. Coronary sclerosis would, of course, make the disbalance between coronary flow and cardiac work more pronounced.

The analytic method of studying the action of drugs which our experiments exemplify is essential in clarifying the synthetized action of drugs on the various activities of the heart and the circulation in the intact animal. It is vital to rational treatment, but data obtained from such studies must be carefully integrated with the other actions of the drug before the results can be applied in man. This is particularly the case with so-called coronary drugs.

Twenty-Ninth Street and Ellis Avenue.

ABSTRACT OF DISCUSSION

DR. FRED M. SMITH, Iowa City: I wish to refer to the action of the nitrites and the purine base derivatives and their use in the treatment of coronary artery disease. Even in extensive arteriosclerosis of the coronary arteries the process concerns for the most part the larger vessels, and the smaller arteries, especially the arterioles, are generally remarkably free from involvement. Thus the arterioles and the capillaries are usually intact and capable of responding to the action of the vasodilator drugs. There does not seem to be any doubt regarding the vasodilating action of the nitrites on the coronary arteries. The results from experimental studies are generally

7. Zwemer, R. L., and Seudder, J.: *Am. J. Physiol.* **119**: 427 (June) 1937.

8. Katz, L. N.; Weinstein, W., and Jochim, K.: *Am. Heart J.* **15**: 452 (April) 1938.

9. Katz, L. N., and Lindner, E.: *Am. J. Physiol.* **126**: 283 (June) 1939.

10. Katz, L. N., and Long, C. N. H.: *Proc. Roy. Soc., London*, s. B **99**: 8, 1925-1926.

accepted, and moreover dramatic effects are commonly observed from the use of glyceryl trinitrate and amyl nitrite in the treatment of attacks of angina pectoris. It is believed, however, that the effectiveness of these preparations may be increased if given more often. I usually prescribe glyceryl trinitrate and direct that it be taken three or four times a day in addition to the amount necessary to control attacks, with the idea of possibly promoting the development of collateral circulation. However, one should test out the action of these drugs on the individual. There has been considerable doubt regarding the action of the purine base derivatives. At the present time, however, the evidence is overwhelmingly in favor of a dilating action on the coronary arteries. Furthermore, the clinical results are in general accord with this concept. A fairly good percentage of patients with angina pectoris will derive benefit from these preparations if given in adequate doses. The results, however, are far more striking if a preparation such as aminophyllin is administered intravenously. Dramatic results are commonly observed in the treatment of acute ventricular failure on the left side. Moreover, the pain of acute coronary thrombosis may be abolished by this form of medication.

DR. GEORGE V. LEROY, Chicago: What interested me most was the effect the authors obtained with different drugs on coronary flow and the fact that these results were obtained in denervated, isolated, fibrillating hearts. It has always seemed to me that the denervated, isolated, fibrillating heart does not exactly represent the situation that confronts the therapist. He wishes, if possible, to alter the circulation in the coronary arteries to improve the blood flow in terms of a given demand. My experiments have been performed by means of the Morawitz cannula, which the authors do not approve so highly, and, surprisingly, the results are very comparable with theirs. I questioned the validity of experiments even with the cannula, because the dog was under an anesthetic, so I constructed a Rein thermostromuhr, and my experiments with it have paralleled those of Dr. Essex. Using several of the drugs which the authors mentioned, specifically epinephrine and amphetamine, which is related to it, acetylcholine, pitressin, the purine base diuretics and glyceryl trinitrate, I found the variations of the coronary flow to have been in the same direction as when other methods were used. The finding of the same magnitude and direction of flow changes with different methods: with the isolated, fibrillating heart, perfused under constant pressure, the finding of the change of the same magnitude with the Morawitz cannula in the coronary sinus and the finding of the same change in magnitude with the Rein thermostromuhr on a coronary artery of a conscious dog that walks into the laboratory and receives the injection suggest that criticism of any of the three methods in terms of the other is not justified. One point which has interested me was the effect of pitressin. The reduction of flow that the authors found is similar in extent to what I ordinarily find in my preparations, either with the thermostromuhr or with the Morawitz cannula. This restriction in flow may be abolished very promptly by the administration of some of the xanthines. A dose of aminophyllin or theobromine relaxes it completely and the flow comes back to normal. The same is true of amphetamine and epinephrine. It appears that the effect of pitressin is a transitory affair which can be eliminated.

DR. GEORGE K. FENN, Chicago: Dr. Smith called attention to the uniformly good results in the matter of coronary dilation with the purine base diuretics. Our work, in which Dr. LeRoy participated and which was done largely by him, drew pitressin to my attention. Pitressin, measured both by the Morawitz cannula and by the Rein thermostromuhr, caused a tremendous decrease in coronary flow, which we assumed was on the basis of coronary constriction. Because of the widespread use of pitressin as a postoperative medication, we thought that attention might well be drawn to its clinical possibilities. I would hesitate to give a patient who had any sign of coronary disease any considerable amount of pitressin. The same might be said about the potassium salts so often given in shock.

DR. ERWIN E. NELSON, New Orleans: I should like to ask Dr. Katz a question with respect to the action of pitressin versus solution of posterior pituitary. In the laboratory I usually find that pitressin is a great deal more toxic than the equivalent amount of solution of posterior pituitary.

DR. LOUIS N. KATZ, Chicago: We have had no experience with the preparations of solution of posterior pituitary of which Dr. Nelson speaks. I am pleased to know that the results reported by Dr. LeRoy on unanesthetized animals with the Rein thermostromuhr are in accord with data obtained in anesthetized animals with the Morawitz cannula and with the data presented by us on the isolated heart preparation. However, it seems to me that it is hazardous to conclude that the mode of action is identical in the three cases. As we stated in our report, in the intact animal other factors besides active change in the tone of the musculature of the coronary vessels contribute to determine the coronary flow. It is unwarranted, therefore, to attribute all such changes in flow to active coronary dilatation or constriction. Only when the role of the passive factors is eliminated or discounted can that deduction be made. For example, histamine decreases coronary vessel tone, as we have shown; yet when it is given to the intact animal or to man the profound drop in blood pressure may counteract this direct coronary action and decrease coronary flow. Again, epinephrine actively dilates the coronary vessels, and this is apparent in the intact animal; yet when given to patients with coronary sclerosis and angina pectoris it will in many instances precipitate an anginal attack because it increases the work of the heart more than it increases coronary flow. I agree with Dr. Fenn that our results point to a hazard in the clinical use of pitressin and large amounts of potassium arising from their marked constrictor action on the coronary vessels. It seems to me just as important to emphasize that calcium is a powerful coronary dilator and that in the form of calcium gluconate it might be judiciously tried clinically when coronary dilatation is needed.

ACUTE OSTEOMYELITIS WITH STAPHYLOCOCCEMIA

A CLINICAL REPORT ON THE USE OF ANTITOXIN IN ITS TREATMENT

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In 1936 Joyner and Smith¹ reported from Duke Hospital excellent results with the use of staphylococcus antitoxin in the treatment of thirteen² cases of osteomyelitis in which staphylococcemia was present. In their series there were eleven survivals and two deaths as compared with eight survivals and eight deaths in their control group of sixteen similar cases in which therapy was identical except for use of antitoxin.

Previously Dolman³ had reported the results of a series of thirty-two cases of acute staphylococcal osteomyelitis with septicemia which had been treated with staphylococcus antitoxin; in his series there was a mortality rate of 31 per cent. In his control series Dolman, like Joyner and Smith, reported a mortality rate of 50 per cent.

Recently Stookey and Scarpellino⁴ stated: "It is remarkable that a vast accumulation of experimental facts pertaining to the protective properties of staphylococcal antitoxin against toxin should produce little clinical interest." We feel that the cause of this lack of clinical interest in the use of staphylococcus antitoxin

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Read before the Section on Orthopedic Surgery at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Joyner, A. L., and Smith, D. T.: Acute Staphylococcus Osteomyelitis: The Use of Staphylococcus Antitoxin as Aid to Management of Toxemia and Staphylococcemia, *Surg., Gynec. & Obst.* 63:1 (July) 1936.

2. Included in sixty-five cases here reported.

3. Dolman, C. E.: Staphylococcus Antitoxin Serum in the Treatment of Acute Staphylococcal Infections and Toxemia, *Canad. M. A. J.* 31:1 (July), 130 (Aug.) 1934.

4. Stookey, P. F., and Scarpellino, L. A.: Staphylococcus Septicemia, *South. M. J.* 32:173 (Feb.) 1939.

can be explained partly by an inadequate understanding of the criteria of its use and partly by the conflicting results that have been reported by several authors. In reviewing the work of the latter group it is of interest to note that no uniform criteria were followed in the use of the antitoxin, and the other therapeutic measures

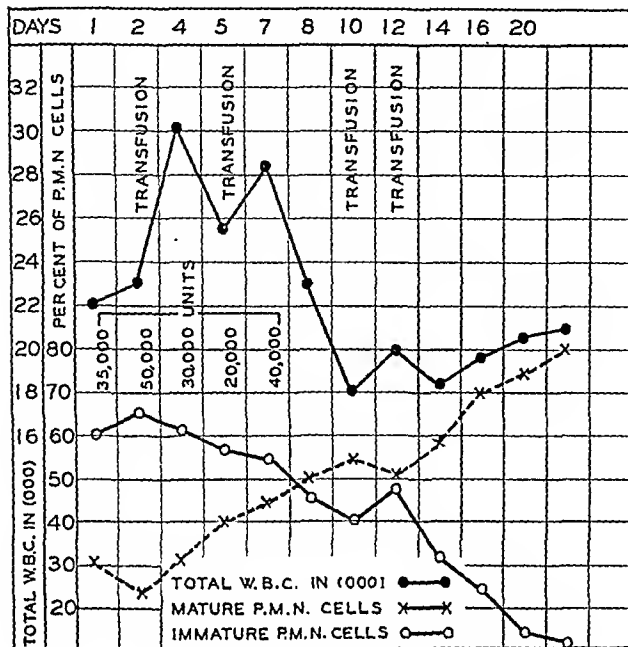


Fig. 1.—Hemogram of a patient with acute staphylococcal disease.

employed were not commensurate with those outlined by Dolman and later by Joyner and Smith.

In 1894 Van de Velde⁵ discovered that the staphylococcus produced a filtrable leukocyte-destroying toxin, a leukocidin. Neisser and Wechsberg⁶ and numerous other investigators verified Van de Velde's original studies. The observations of these workers have since been expanded by Wadsworth and Hoppe,⁷ Burnet,⁸ Parker,⁹ Pike¹⁰ and others. These investigators have demonstrated a variety of effects of the staphylococcus exotoxin, of which the four most important are (1) the destruction of leukocytes, (2) the hemolysis of red blood cells, (3) the coagulation of plasma and (4) the necrosis of tissue. It has not been established whether these effects are the results of numerous exotoxins or are the result of one exotoxin with a variety of actions. Numerous strains of staphylococci are capable of producing the various effects, and it has been shown by Pantan and Valentine,¹¹ Burky,¹² Dolman¹³ and many others that the antitoxin stimulated by one strain of staphylococcus is capable of neutralizing the toxins of any other strains. On this postulate is based the clinical use of the staphylococcus antitoxin. Robertson¹⁴

measured the staphylococcus antitoxin titers in the blood of 305 normal persons and used the titer method in determining the level of antitoxin in the patient's blood. Weaver¹⁵ studied the antitoxin content in well over 200 cases of osteomyelitis and found that in acute osteomyelitis with a favorable prognosis staphylococcus antitoxin appears in unbelievable amounts, whereas in the fatal cases no antitoxin is present.

Joyner and Smith found that the severity of the toxemia in experimental rabbits could be estimated by the shift in the ratio of the mature to the immature polymorphonuclear leukocytes found in the circulating blood rather than by changes in the total white cell count. They found the same to be true in certain patients with acute staphylococcal disease (fig. 1). This decrease in the percentage of mature polymorphonuclear leukocytes was present in the thirteen children with acute osteomyelitis reported by them. In the eleven children of their series who survived, the administration of staphylococcus antitoxin¹⁶ was followed by general improvement, a decrease in the percentage of immature polymorphonuclear cells and an increase in the percentage of mature segmented cells (figs. 1 and 2), whereas in the two children that died the relationship of the mature to the immature cells failed to change following the administration of antitoxin. Stookey and Scarpellino called attention to the hopelessness of cases in which large bacterial emboli lodge in the cortex of the brain or in vital centers inaccessible to surgical drainage. One of their patients who failed to respond to antitoxin therapy died three days after onset of the illness. At necropsy only three small lung abscesses were found, but the viscera were very dark. They interpreted these phenomena as suggesting fixation of the toxin to the tissues. We feel that the latter hypothesis

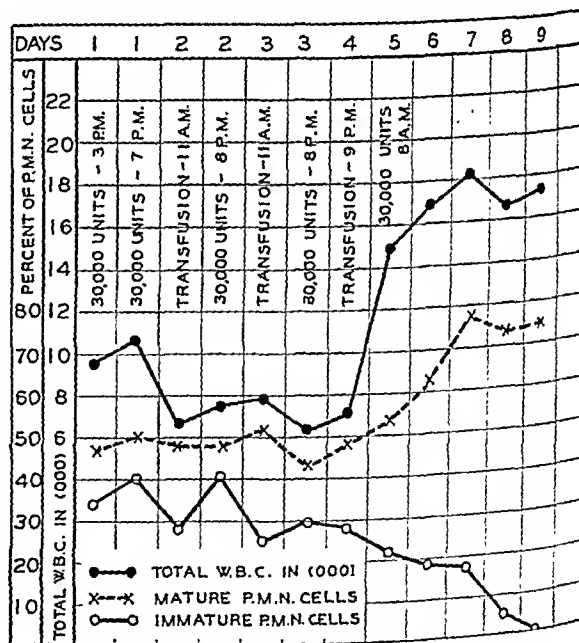


Fig. 2.—Hemogram of a patient with acute osteomyelitis.

is worthy of further investigation and might well explain the fact that some patients fail to show any response to antitoxin even when apparently adequate drainage has been provided.

As Robertson has pointed out, "Its power to cause serious change in the vascular system is the factor that

15. Weaver, J. B., cited by Stookey and Scarpellino.
16. Prepared from the toxin produced by Burky's Ha strain of *Staphylococcus aureus*. Supplied by Lederle Laboratories, Inc.

5. Van de Velde, H.: Etude sur le mécanisme de la virulence du staphylococcus pyogène. *Cellule* 10: 403, 1894.

6. Neisser, M., and Wechsberg, F.: Ueber das Staphylokin, *Ztschr. f. Hyg. u. Infektionskr.* 36: 299, 1901.

7. Wadsworth, A. B., and Hoppe, E. N.: The Action of Bacterial Culture Products on Phagocytosis, *J. Immunology* 6: 399 (Nov.) 1921.

8. Burnet, F. M.: Interactions of Staphylococcus Toxin, Anatoxin and Antitoxin, *J. Path. & Bact.* 34: 471-492 (July) 1931.

9. Parker, J. T.: Production of Exotoxin by Certain Strains of Staphylococcus Aureus, *J. Exper. Med.* 40: 761-772 (Dec.) 1924.

10. Pike, R. M.: Depression of Phagocytosis by Products of Staphylococci, *J. Immunol.* 26: 69-80 (Jan.) 1934.

11. Pantan, P. N., and Valentine, F. C. O.: Staphylococcal Toxin, *Lancet* 1: 506-508 (March 5) 1932.

12. Burky, E. L.: Studies on Cultures and Broth Filtrates of Staphylococci; Antitoxin Content of Rabbit Serums Immune to Staphylococcus Toxin and Precipitin Reactions of Such Serums, *J. Immunol.* 25: 419-437 (Nov.) 1933.

13. Dolman, C. E.: Pathogenic and Antigenic Properties of Staphylococcus Toxin, *Canad. J. Bact.* 13: 131 (March) 1932.

14. Robertson, D. E.: Osteomyelitis, *J. Bone & Joint Surg.* 20: 35 (Jan.) 1938.

makes staphylococcal osteomyelitis one of the most dreaded diseases occurring in the young." He is of the opinion that the severity of the disease depends not so much on the number of organisms present as on the individual's natural ability to destroy the organism by phagocytosis and to produce antitoxin to neutralize or render inert the toxins produced by the organism. He reported unsatisfactory results in nine cases of staphylococcal osteomyelitis in which intravenous antitoxin was

TABLE 1.—Mortality in 103 Cases of Staphylococcemia

	Total Cases	Survived	Died	Mortality Rate, %
Given antitoxin.....	47	29	18	38
Not given antitoxin.....	66	13	43	76
Total.....	103	42	61	59

used. He did not give any review of what criteria he followed in selecting his cases and in administering the serum and he did not give the dosage used except in one case; it is therefore difficult to evaluate his data. There is one important factor which may have influenced his results, that is, his effort to combat the septicemia and toxemia without carrying out early drainage of the site of infection. We are convinced that early drainage is absolutely necessary if one is to combat the constant liberation of toxin from the focus. We have concluded

TABLE 2.—Staphylococcemia with Osteomyelitis

	Below 5 Years		5 to 9 Years		10 to 15 Years		16 to 20 Years		21 to 30 Years		Over 30 Years		Total			Mortality Rate, %
	Survived	Died	Survived	Died	Survived	Died	Survived	Died	Survived	Died	Survived	Died	Survived	Died	Cases	
Given antitoxin.....	2	3	10	1	11	3	2	1	..	1	1	..	26	9	35	25.7
Not given antitoxin.....	..	2	3	2	6	6	..	2	..	2	..	7	9	21	30	70
Total cases.....	7		16		26		5		3		8		35	30	65	46.1

from our autopsy results that a lack of response to antitoxin therapy can in a large percentage of cases be attributed to incomplete drainage of the osteomyelitis or to the presence of inaccessible foci. Robertson's work was not primarily concerned with staphylococcus antitoxin and its use but dealt in detail with staphylococcus titers and toxoids; it is an excellent treatise on this subject and it should stimulate interest in the use of staphylococcus toxoid. Williams¹⁷ has reported the results of the use of staphylococcus antitoxin in the treatment of twenty-four cases of acute osteomyelitis and has compared the clinical course of this series with that of forty-two cases of acute osteomyelitis in which the antitoxin was not used. The size of his doses according to our methods was in the majority of instances entirely inadequate. His cases were evidently picked with no regard to the presence or absence of toxemia. He stated: "Blood cultures, performed in four instances, showed a staphylococcemia" and he concluded that the serum had not been of "much extra benefit"; however, he admitted that little comparison could be made between the potency of his serum and of that used by Dolman. His paper is a comprehensive review of acute osteomyelitis, but it confuses the purpose for which staphylococcus antitoxin should be used. It is not amiss at this time to state that staphylococcus antitoxin has one and only one role: the neutralization of the staphylococcus toxin or toxins which, when liberated in the circulating blood, cause the destruction of leukocytes, the hemolysis of red blood cells, the coagulation of plasma and the necrosis of tissue.

17. Williams, S. W.: The Early Treatment of Acute Staphylococcal Osteomyelitis, M. J. Australia 2: 459 (Sept.) 1937.

STATISTICS

Of 648 cases of staphylococcal disease reviewed in the preparation of this paper there were 103 cases with a definite staphylococcal septicemia; of these 103, in sixty-five there was osteomyelitis. This report is concerned primarily with the cases of osteomyelitis, but the statistics of the 103 cases of staphylococcal septicemia may be of general interest and are therefore recorded (table 1). Of the 103 patients sixty-one died and forty-two survived, a mortality rate over all of 59 per cent. Of the patients not treated with staphylococcus antitoxin forty-three died and thirteen survived, a mortality rate of 76 per cent; whereas of the forty-seven patients treated with staphylococcus antitoxin eighteen died and twenty-nine survived, a mortality rate of 38 per cent. The patients ranged in age from 3 weeks to 66 years; the average age was 20 years. The sixty-five patients with osteomyelitis ranged in age from 3 weeks to 62 years, with an average age of 15 years.

Table 2 shows the age groups of the patients with osteomyelitis and the results for each group. Sixty-five patients with osteomyelitis had proved staphylococcemia. Of these sixty-five there were thirty who did not receive staphylococcus antitoxin; of this group nine survived and twenty-one died, a mortality rate of 70 per cent. There were thirty-five patients treated with

antitoxin; of this group twenty-six survived and nine died, a mortality rate of 25.7 per cent. In the group treated with antitoxin the average duration of illness on admission was 7.6 days. In the group not receiving antitoxin the average duration of illness on admission was 9.8 days.

The blood picture expressed in colonies of staphylococcus per cubic centimeter of blood is shown in table 3. Of the group not receiving antitoxin there were only two survivors whose blood showed over one colony

TABLE 3.—Blood Culture in Osteomyelitis

No. of Colonies per Cc. of Blood	Given Antitoxin		Not Given Antitoxin	
	Survived	Died	Survived	Died
Not recorded.....	3	..	..	8
1 or less.....	5	..	7	2
2 to 10.....	10	1	2	3
11 to 50.....	4	5	..	2
50 to 100.....	3	2	..	2
100+.....	1	1	..	4
Total.....	26	9	9	21

per cubic centimeter and no survivors whose blood showed over ten colonies per cubic centimeter, whereas in the group receiving antitoxin there were eighteen survivors in whose blood there was over one colony per cubic centimeter, and eight of these eighteen showed over ten colonies per cubic centimeter. Of the nine fatal cases in which antitoxin was used, death was attributed to inadequate drainage in five cases, inaccessible foci in two and pneumonia in two. In three of these cases antitoxin therapy was not indicated as each showed a high ratio of mature leukocytes, and in two

of the fatal cases there was a favorable response to the antitoxin, that is, there was a shift of the hemogram to the mature side. We feel that in the latter five cases death was due not to the toxic effect of the staphylococcus but to the absorption of nonspecific toxins or to the infection of vital centers.

ROUTINE TREATMENT

As far as possible our routine treatment in suspected cases of osteomyelitis has been carried out according to the following plan but not necessarily in the order named (since the studies are made by several workers, and conditions of course vary in every case): An adequate history is obtained, and a complete physical examination is done. Sedation is carried out as indicated, and the dehydration which is usually present is combated by intravenous fluids in the form of physiologic solution of sodium chloride with 5 to 10 per cent dextrose. A hemoglobin determination is made and red blood cell and white blood cell counts are done. The leukocytes are differentiated to estimate the relative percentage of mature and immature polymorphonuclear cells, and it is on this relationship, regardless of what the total white cell count may be, that we determine whether or not the administration of antitoxin is indicated: antitoxin therapy is instituted if there is an increase in the percentage of nonsegmented and a rela-

TABLE 4.—Study of Fatal Cases

	Necropsy	
	Yes	No
Given antitoxin.....	5	4
Not given antitoxin.....	13	8
Total.....	18	12

tive decrease in the percentage of segmented polymorphonuclear cells found in the circulating blood. Blood cultures are planted and the patient is grouped and matched for transfusions; preoperative blood transfusion of from 150 to 200 cc. is given; as a rule, the donor is bled of from 500 to 600 cc. and the remainder of the blood is given in twelve to twenty-four hours or postoperatively. If a diagnosis of osteomyelitis is made, the patient is prepared for immediate operation. The type and extent of operation depend on the individual features of the disease in each case and will be discussed later. It should be said here that immediate and adequate drainage is a prime requisite if the use of staphylococcus antitoxin is to be effective. Preoperative roentgenograms are made as a matter of record but have been of little if any diagnostic value in the earlier cases. Postoperative care will be outlined under the several headings that are to follow. As already stated, we use the hemogram picturing the relative percentage of mature and immature polymorphonuclear cells as the main guide in determining the degree of toxemia which may be neutralized by antitoxin therapy. The general toxemia of the patient, evidenced by high temperature, increased pulse rate, respiratory distress, flushed face, dilated pupils and sometimes delirium, is considered in outlining the general care but not as an indication for the use of staphylococcus antitoxin; the patient might well be neutralizing the staphylococcus toxin with his own antitoxin and his apparent toxic condition be due to other elements. Burnet has pointed out that other factors besides the production of toxin play a part in determining the fatal outcome in staphylococcal infection in animals. Stookey and Scarpellino

reported a case in which in their opinion death was caused by the absorption of necrotic products and the nonspecific toxins of necrotic tissue in a surgically accessible area that had not been adequately drained.

METHODS OF ADMINISTERING THE SERUM¹⁵

A skin test for sensitivity should be made intradermally with 0.1 cc. of the undiluted antitoxin; also 0.1 cc. of a 1:10 dilution of normal horse serum should be administered intradermally as a control. Frequently the patient responds negatively to normal horse serum and with an immediate urticarial wheal to the antitoxin. This variation indicates an antigen-antibody reaction in the skin and not a sensitivity to horse serum. Patients showing a reaction to the antitoxin should always receive the first dose intramuscularly, followed four hours later by intravenous antitoxin. As a general rule the first dose of the serum for children under 10 years of age has been 20,000 units administered intramuscularly. Children over 10 have received initial doses up to 40,000 units. If there is no reaction to the first dose, we advocate intravenous administration for the subsequent doses. The antitoxin is administered intravenously with a gravity apparatus. The amount of serum is estimated and twice its volume of saline solution is poured into the gravity apparatus. After the needle is in place, the antitoxin is poured on to the saline solution and administered slowly over a period of twenty minutes or longer. The initial dose is usually followed in four hours by an intravenous dose of from 40,000 to 60,000 units, depending on the size of the patient. The dose of from 40,000 to 60,000 units is repeated after twenty-four hours. Often this is sufficient to shift the white blood cells back to a favorable ratio. If this shift has not occurred in twenty-four hours, from 40,000 to 60,000 units is given intravenously every twenty-four hours until there is a favorable shift.

With the use of the new highly purified serum¹⁶ in the past three years we have had no case of serum sickness. One of our patients, aged 6 years, received 700,000 units and another patient, aged 8 years, received 600,000 units, each within a period of three weeks, and neither developed any sensitivity to the serum.

OPERATION

A detailed discussion of the relative virtues of early or delayed operation in the treatment of osteomyelitis is outside the scope of this paper; however, experience controlled by the results of eighteen necropsies (table 4) has taught us that if antitoxin therapy is to be effective it is necessary that all foci of infection receive early and adequate drainage in order that the constant absorption of the toxins may be eliminated. Our operative procedures vary according to the features of each case: when possible, we follow a modification of the treatment advocated by Orr,²⁰ that is, free drainage and absolute immobilization. At operation an opening of sufficient size and extent to drain the focus is made. Early in our series we frequently used multiple drill holes as outlined by Starr²¹ and have found this procedure satisfactory, but of late we have windowed the bone to assure adequate drainage; we are of the opinion that the results of the latter method are the more

15. The antitoxin used in this series of cases was administered with the direction of Drs. D. T. Smith and W. R. Haas. A more detailed study with the results of antitoxin in the treatment of experimental staphylococcal septicemia will be reported later by these authors.

19. Supplied by Lederle Laboratories, Inc.

20. Orr, H. W.: The Treatment of Early Osteomyelitis by Drainage and Rest, *J. Bone & Joint Surg.* 9: 733 (Oct.) 1927.

21. Starr, C. L.: Acute Hematogenous Osteomyelitis, *Arch. Surg.* 4: 567 (May) 1922.

satisfactory. It is rare that we find simple incision of a subperiosteal abscess sufficient to provide adequate drainage. In the cases in which this method of treatment was used the acute course has been prolonged and the extent of bony involvement increased. In carrying out the Orr method we deviate somewhat from his original recommendations: we irrigate the incision thoroughly with physiologic solution of sodium chloride but do not apply antiseptics as we feel it is futile to try to kill the infection locally and believe the damage done to the tissues by the antiseptics is detrimental to healing. In making our incision through the periosteum we do not reflect the periosteum but, as suggested by Albee and Patterson,²² incise round the area to be removed. Before windowing the bone we usually make exploratory drill holes into the suspected area to determine the presence of pus and its exact location. In order better to visualize the type of material coming from the openings, all drill holes are made with the incision filled with ether. After the exact site of infection is determined, the area is windowed or saucerized, depending on the acuteness of the illness. The defect is packed with petrolatum gauze to which an excess of petrolatum has been applied. We use 2 inch gauze with salvaged (finished) edges; we have found this type of material much better than that with the unsalvaged edges, as it does not ravel and leave loose threads embedded in the newly formed granulation tissue. The entire wound is filled with the petrolatum gauze and covered by a dry dressing. A plaster cast is then applied to immobilize the part in the optimal position for function. The dressing is not disturbed unless there is a rise in temperature or other signs of increased sepsis. The merits of this type of treatment have been well described by previous writers and need no further discussion here. Convalescent care consists of continued rest and immobilization until healing has taken place or at least until all danger of contracture and deformity has passed. A high vitamin, high caloric diet is augmented by cod liver oil, thiamin chloride and ascorbic acid.

Although our experience in its use is limited, we are of the opinion that staphylococcus toxoid is of definite benefit during the recovery period. Robertson has outlined in detail one method of administering the toxoid. Since the beginning of the preparation of our report Whitby²³ has found sulfapyridine to be an active chemotherapeutic agent in the treatment of staphylococcal infection in mice, and his work has been confirmed by Bliss and her associates.²⁴ Long²⁵ noted that the institution of sulfapyridine therapy was followed by a rapid sterilization of the blood in three of five patients ill with staphylococcal bacteremia. He did not report the degree of toxemia or the colony count per cubic centimeter in the blood of the patients treated. He was of the opinion that on the basis of the available experimental and clinical evidence careful therapeutic trials of the drug were warranted. McColl²⁶ has found sulfapyridine effective in the treatment of staphylococcal infection on the surfaces of the upper respiratory system but has not found the same to be true in undrained areas. Smith²⁷ has used sulfapyridine in a

number of cases treated with antitoxin and, although it is too early to give a final opinion, he states that it appears that the use of this drug in combination with antitoxin may be definitely superior to either treatment when used alone.

CONCLUSIONS

1. Staphylococcus toxins can be neutralized in vivo by commercial serum.
2. Antitoxin therapy is indicated only when the patient has failed to create sufficient autogenous antitoxin to neutralize the toxins present.
3. The degree of toxemia can be estimated for clinical guidance by the ratio of the mature to the immature polymorphonuclear leukocytes found in the circulating blood.
4. It is necessary to have early and adequate drainage of all foci of infection if antitoxin therapy is to be effective in combating the toxemia.
5. The antitoxin serum which we have used can be administered intravenously with safety and without the subsequent development of serum sickness.
6. The surgical and postoperative procedures as advocated by Orr in the treatment of acute osteomyelitis have been found to be the most satisfactory as well as the most practical form of surgical therapy.

ABSTRACT OF DISCUSSION

DR. JAMES B. WEAVER, Kansas City, Mo.: For over four years I have measured antitoxin in the blood stream and done Schilling counts, as Drs. Baker and Shands have done, in more than 200 cases of acute, chronic and recurrent osteomyelitis. I get more information from measuring the antitoxin content of the blood stream than I do from the Schilling count. The Schilling count is a much simpler test and is better from that standpoint; however, more things have to happen within the host to produce results and that gives more opportunities for greater error. I have found that in counting 100 cells, which I usually do, there is some variation. To get a really accurate Schilling count one should count several hundred cells. Most of the authors' patients as well as my own in the acute stage received numerous transfusions, and I wonder what the effect of the donor blood had on the Schilling count. The measurement of antitoxin in the blood stream is not foolproof. Theoretically it is not what one would have it, because there are other substances in staphylococcus toxin besides the hemolytic factor, which is the basis of this test. There are leukocythemia and the necrotic element, and this test is based on only one of these. To date it is not known whether these substances run parallel in toxin or not, but by measuring the antitoxin content daily I think I can prognosticate fairly well what is going to happen to the patient. It has been my experience that patients who do not make their own antitoxin do not survive. Those who do make their own antitoxin in a fair amount usually survive but as a rule run into difficulty later on. Their sinuses are much more chronic in healing, and they have much more recurrent osteomyelitis. In cases in which a tremendous amount of antitoxin is produced the prognosis for fairly prompt healing and against recurrence is quite good. As to the mortality in treating these patients with staphylococcus antitoxin, my series is in no way comparable to the authors'. I have never had a patient die of acute osteomyelitis with septicemia to whom I did not give antitoxin. The reason for that was that I was fairly certain that the patient was going to survive and I did not give the antitoxin. Patients who I thought would not survive received antitoxin. So I have a high mortality rate. I have seen positive hemograms, that is, favorable hemograms, as Drs. Baker and Shands show, mounting daily as the antitoxin tide has dropped, so those two factors are not parallel. They are in the first two weeks, but after that not at all.

DR. BEN L. SCHOOLFIELD, Dallas, Texas: I have for some years used an autogenous vaccine in a considerable number of cases of acute and chronic osteomyelitis. That apparently has been of considerable benefit, but when one is doing a great deal of surgery along with it one never knows which does the most

22. Albee, F. H., and Patterson, M. B.: *The Bacteriophage in Surgery*, Ann. Surg. 91: 855 (June) 1930.

23. Whitby, L. E. H.: Chemotherapy of Bacterial Infections (Bradshaw Lecture), *Lancet* 2: 1095-1103 (Nov.) 1938.

24. Bliss, Eleanor A., and Long, P. H.: Comparative Therapeutic Effects of Sulfapyridine in Experimental Staphylococcus Aureus Infections in Mice, *Proc. Soc. Exper. Biol. & Med.* 40: 32-34 (Jan.) 1939.

25. Long, P. H.: Sulfapyridine, *J. A. M. A.* 112: 538-539 (Feb.) 1939.

26. McColl, W. A.: *Trans. M. Soc. North Carolina*, to be published.

27. Smith, D. T.: Personal communications to the authors.

good. Certainly, the vaccines alone cannot be depended on. I tried that on one patient who refused surgery and apparently no particular benefit was obtained, but I do believe that the administration of an autogenous vaccine, made from the patient's own pus, is distinctly beneficial.

DR. LENOX D. BAKER, Durham, N. C.: As to the use of the titer method and the use of white cell counts, at our place the titer method as a clinical procedure is not practical at this time. We find that the white cell count can be followed by clinical clerks and that it is the most practical way we have of judging the amount of toxemia present. As to the value of blood transfusion without the use of antitoxin, all I can say is that our patients who were not given the antitoxin had just as many blood transfusions as the patients who were given the antitoxins. As to the amount of antibodies the donors might carry, we observed a boy aged 16 with osteomyelitis of the femur who had been given sixteen transfusions over a period of thirty-eight days. For the seventeenth transfusion we used an immunized donor; that is, a donor who had been immunized to the patient's own organism. Twenty-four hours after this donor was used the patient's white cell count shifted back to a normal ratio, his temperature dropped to normal and he made an uneventful recovery. I have no doubt that the donor's blood had a great deal to do with it, but we cannot always find such a donor and we do not know which donor will manufacture antitoxin. As to the use of autogenous vaccines, these cases are emergencies that are in need of immediate assistance if recovery is to be hoped for. At this stage vaccines and toxoids have not been of benefit in our hands.

MALE SEX HORMONE

CLINICAL APPLICATION

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The numerous claims and conflicting reports concerning treatment with male sex hormone make it desirable to define its use more precisely.

The testis consists essentially of two parts: (1) the seminiferous tubules, the most important function of which is to produce spermatozoa, and (2) the interstitial cells of Leydig, the most important function of which is to produce male sex hormone.¹ What relationship, if any, exists between these two structures is unknown. On the production of the male sex hormone depends the development of secondary sex characteristics, namely the growth of the penis, scrotum, prostate, seminal vesicles, epididymis, vas deferens, body hair, beard, pitch of the voice and, to some extent, skeletal growth, including the contour of the body. Observations of the last few years have demonstrated conclusively that a delicate balance exists between the anterior lobe of the pituitary and the testis.² The pituitary apparently stimulates the activity of the testis, which in turn may serve as a check on the pituitary itself. Various factors involved in the initiation of the pituitary stimulus are not clearly understood. There is some evidence that there may be two gonadotropic factors corresponding to two gonadotropic effects of the anterior lobe of the pituitary. One causes development of the follicles of the ovary and influences the function

of the seminiferous tubules in the testis (the so-called follicle stimulating hormone), and the other causes luteinization of follicles in the ovary and influences the activity of the interstitial cells in the testis (the so-called luteinizing hormone). Menopausal and castrate urines contain primarily the follicle stimulating material, while human pregnancy urine contains largely the luteinizing factor and is available under various trade names (follutein, korotron, A. P. L., antuitrin-S). The gonadotropic material from the serum of the pregnant mare (e.g. gonadogen, gamone) and commercial preparations prepared from the pituitary itself contain both factors. It is obvious that the testis may be stimulated selectively.

Two types of hormone therapy are now possible in hypofunction of the testis: (1) stimulation therapy with gonadotropic material and (2) substitution therapy with male sex hormone. With gonadotropic material the testis is stimulated to increased activity so that the testis itself produces more male sex hormone, and it is to be preferred in most instances in which the testis is capable of responding to stimulation. Examples of conditions in which stimulation is indicated are the Fröhlich syndrome, hypopituitarism with secondary hypogenitalism, and undescended testes. In substitution therapy the male sex hormone, which the testis itself is not capable of producing in sufficient quantity when stimulated, is supplied artificially. Examples of conditions in which it is indicated are eunuchism, eunuchoidism and all cases in which the testis is incapable of response because of atrophy or destruction (e.g. the orchitis of mumps). The male sex hormone has also been reported to produce improvement in patients with benign prostatic hypertrophy and to rejuvenate old men. It appears to alter the function of the normal testis as judged by decrease in spermatogenesis during its administration.

In just what form the male sex hormone is secreted by the testis is unknown. The most active substance isolated so far is testosterone, which is six times as potent as androsterone, the first androgenic material isolated from urine. Certain esters of testosterone are much more potent than testosterone itself and in clinical work the propionic acid ester (testosterone propionate³) is now most commonly used. In addition to testosterone, which has been isolated from the testis, and androsterone and dehydro-androsterone, which have been isolated from urine, twenty-seven related substances with male hormone characteristics have been prepared synthetically by the degradation of sterols, but these are not used therapeutically. For therapeutic purposes testosterone is made synthetically. It is of the greatest interest that from the ovary, testis and adrenal, which come from about the same location in the embryo, important substances have been isolated which show only slight differences in their chemical structure and which may all be derived biologically from cholesterol (estradiol, progesterone, testosterone, desoxycorticosterone).

Very little androgenic material has been recovered from the urine of young boys and girls from 6 to 10 years of age—only from 0.7 to 2 international units per liter. A marked increase in the amount found in urine begins at about the time of puberty, the urine of an adult male containing from 40 to 100 international units in twenty-four hours.⁴ The amount secreted appears

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1. There is some evidence that the cells of Sertoli may produce a hormone different from that produced by the interstitial cells.

2. Various factors involved in the interrelation of the pituitary and testes have recently been reviewed by C. R. Moore (Gonadotropic Substances and Male Hormone Effects in the Organism, *J. Urol.*, to be published).

3. The testosterone propionate (oreton) used in this study was supplied by the Seehring Corporation.

4. Koch, F. C.: The Male Sex Hormones, *Physiol. Rev.* 17:151 (April) 1937.

to diminish with advancing years, but no accurate data are available. What role, if any, sex hormones play in embryonic development has not been established, but they may be responsible for the development of secondary sex characteristics. The well marked growth of the interstitial cell mass in the testis of the embryo would suggest this possibility.

For some reason not clearly understood, estrogenic material is found in male urine (the equivalent of 10 micrograms of theelin a day) and female urine is just about as rich a source of male hormone as male urine and contains from 30 to 100 international units in twenty-four hours.⁴ Koch has pointed out that human urine is unique in its androgenic content, the urine of the stallion, bull, ram and rat containing but little.

EUNUCHISM AND EUNUCHOIDISM

The value of male sex hormone is shown best by its effect on individuals with complete absence of testicular function, namely castrates and eunuchoid individuals. The persistence of bilateral intra-abdominal cryptorchidism beyond the age of puberty commonly results in a condition similar to that produced by castration early in life. However, eunuchoidism is by no means an inevitable result of bilateral failure of testicular descent. In adults with bilateral intra-abdominal cryptorchidism the interstitial cells may show a surprising degree of function, as judged by the development of a normal size penis and prostate and a considerable amount of pubic hair. When the penis of such a person develops normally the body contour is usually normal, but when genital growth fails to take place a state of eunuchoidism usually results. Eunuchoid individuals are usually tall and often slender with the extremities long in proportion to the trunk. The shoulders and chest are narrow. The voice is high pitched and the person is very shy, effeminate and high strung. There may be a feeble attempt at the production of pubic hair but there is usually little or no axillary hair, no beard and no hair on the chest, abdomen, arms or legs. The genitalia remain infantile. The prostate is usually not palpable. The muscles are small and feminine in type. In striking contrast to patients of the Fröhlich type, they often weigh less than normal and often show no development of breast tissue. Eunuchoidism appears to illustrate the effect of testicular deficiency per se, in contrast to the secondary hypogonadism of the Fröhlich syndrome.

In the treatment of eunuchoidism it is necessary to use large doses of testosterone propionate (from 50 to 100 mg. daily). The doses originally recommended (from 1 to 5 mg. daily) are totally inadequate. During the administration of large doses of this material to eunuchoid individuals the following effects are noted:

1. The gradual appearance of the secondary sex characteristics of the adult male. The infantile penis may become normal in size, the prostate develops, and hair grows in the pubic and axillary regions, on the face and on other parts of the body. The pitch of the voice rapidly assumes its characteristic masculine quality. Erections and seminal emissions become very frequent. Priapism has been described.

2. A marked increase in appetite and body weight (as much as 40 pounds [18 Kg.] in four months). The patients do not become obese but show an enormous increase in the size, firmness and strength of muscles. The material appears to stimulate development of the muscular characteristics of the normal male, whereas

in the eunuchoid state the muscle development resembles that of the female. This change is very dramatic.

3. An increase in basal metabolism of as much as 30 points. In our patients who received large doses, the rate was raised above normal.

4. An increase in vigor and sense of well being. The patients are capable of and have the initiative to do much more work, both mental and physical. They seek and become much more proficient in games involving muscle coordination and physical stamina.

5. Loss of their effeminate characteristics. Whereas before treatment they tend to run away from arguments and physical combat, after treatment they tend to welcome opportunities to demonstrate their physical prowess.

A typical example of what may be accomplished with this material is shown in the illustrations.⁵ As in all conditions involving stimulation, the response is determined not only by the stimulating substance but also by the susceptibility of the organ stimulated. There are thus variations in the amount of growth of the penis that may be produced with large doses. From our observations it would appear that the rate at which the development of secondary sex characteristics can be induced cannot be accelerated beyond a certain point. It is to be remembered that the changes associated with normal puberty occur gradually over a period of several years. The details of treatment in eunuchoid individuals are still to be worked out. It is probably necessary to continue intensive therapy for between one and two years and then continue with maintenance therapy for the rest of the patient's life. What the dose for maintenance will prove to be is unknown. In order to simulate natural phenomena and to prevent



Fig. 1.—Appearance of E. W., a eunuchoid patient aged 18, Nov. 11, 1937, before treatment was started. Height 67 inches (170 cm.), weight 111½ pounds (50.5 Kg.).

the development of the skeletal characteristics of the eunuchoid state, it is probably desirable in cases of bilateral intra-abdominal cryptorchidism to begin treatment just before the age of normal puberty, namely, at about the age of 11 years.

5. Genital growth in eunuchoid persons has been reported by the following:

- Hamilton, J. B.: Treatment of Sexual Underdevelopment with Synthetic Male Hormone Substance, *Endocrinology* 21: 649 (Sept.) 1937.
Kenyon, A. T.; Sandiford, Irene; Bryan, A. H.; Knowlton, Kathryn, and Koch, F. C.: The Effect of Testosterone Propionate on Nitrogen, Electrolyte, Water and Energy Metabolism in Eunuchoidism, *Endocrinology* 22: 135 (Aug.) 1938.
Rubinstein, H. S.: The Induction of Sexual Maturity in the Genitally Hypoplastic Adult Through the Use of Testosterone Propionate, *J. A. M. A.* 111: 1818 (Nov. 12) 1938.
McCullagh, E. P.: Treatment of Testicular Deficiency with Testosterone Propionate, *J. A. M. A.* 112: 1037 (March 18) 1939.

In a previous communication to *THE JOURNAL* we⁶ discussed in detail various aspects of the treatment of undescended testis with the anterior pituitary-like principle of pregnancy urine. This material works in cryptorchidism by stimulating the interstitial cells of the testis to produce male sex hormone and produces descent in about one fourth of the cases in young boys. The same results can be produced with male sex hormone itself, but since it may injure the testis it does not appear to be as suitable as stimulation therapy. In rare instances it may cause descent of the testes in eunuchoid individuals. It should be pointed out that both anterior pituitary-like substance and male sex hormone may cause excessive genital growth in young boys and that both may stimulate the rate of skeletal growth. Whether or not this is followed by retardation of growth, so that the final height of the body is reduced, as is the case of some interstitial cell tumors of the testis, is unknown. Both substances are to be used with caution in young boys.



Fig. 2.—Appearance of the patient Dec. 13, 1938, after 629,500 rat units of anterior pituitary-like substance had been given over a period of thirteen months. Height 68½ inches (174 cm.), weight 112½ pounds (51 Kg.).

FRÖHLICH SYNDROME

In cases of the Fröhlich type the effect of stimulation therapy should be tried before male sex hormone is used. Large doses of gonadotropic factor of pregnancy urine are very effective in this condition. If the testes do not respond to stimulation, large doses of testosterone propionate may be used.

BENIGN PROSTATIC HYPERTROPHY

In contrast to the numerous reports of beneficial results from the use of male sex hormone in benign prostatic hypertrophy, our experience with this material in such cases has been disappointing. Since the male sex hormone causes development of the prostate in the first place, it is not easy to understand how its use in benign prostatic hypertrophy would be beneficial. In twenty-two cases of this disorder, testosterone propionate in daily intramuscular injections produced little improvement in the symptoms and clinical course. No noteworthy reduction in the residual urine occurred.

The twenty-two patients fell into two groups. In group 1, made up of nine patients, the average age was 72 years, the youngest patient being 67 and the oldest 91. The prostate gland was enlarged in three

cases to grade 3 plus, in four to grade 2 plus and in two to grade 1 plus. Three patients had an average residual urine of from 200 to 500 cc., two of from 100 to 200 cc. and four of less than 100 cc. They were treated from seven to fifty-six weeks, receiving the testosterone propionate in total amounts of from 560 mg. to 3,200 mg. Two patients showed a slight reduction in frequency during the day and two patients experienced temporarily an increase in libido and the frequency of erections, but no noteworthy decrease in residual urine occurred in any of the nine cases. In two cases in this group an acute retention developed during the administration of the hormone. In group 2, made up of thirteen patients, the ages ranged from 58 to 82 years (average 70 years). The prostate was enlarged in one case to 4 plus, in three cases to 3 plus and in nine to 2 plus. In four cases the average residual urine varied from 100 to 200 cc. and in nine it was less than 75 cc. The patients were treated from four to fifty-two weeks, the total amount of testosterone propionate varying from 200 to 3,990 mg. An analysis of the results in this group showed that two patients discontinued treatment because they felt that they were getting worse. In four cases a temporary improvement in erections was noticed; three patients showed a reduction in nocturia; one also noticed a reduction in frequency during the day. The residual urine of the four patients who had more than 75 cc. showed no noteworthy reduction. Conclusions based on smaller quantities than this are not reliable.

Some improvement has been reported from the use of female sex hormone in the treatment of benign prostatic hypertrophy, but these reports are yet to be confirmed with well controlled data.

STERILITY

Since treatment with male sex hormone represents primarily substitution therapy, it does not appear to be indicated in the treatment of male sterility. In fact, one of us⁷ has been able to depress the number of spermatozoa in men with normal counts almost to the



Fig. 3.—Appearance of the patient May 4, 1939, after 44 mg. of testosterone propionate had been given over a period of four and one-half months. Height 72 inches (183 cm.), weight 147½ pounds (66.9 Kg.). The very slight response to large doses of anterior pituitary-like substance stands in striking contrast to the response to testosterone propionate. Hair, which cannot be seen in the picture, developed all over the body. Note the increase in the size of the muscles. The prostate, not palpable before administration of testosterone, became 2 cm. in diameter and bulged into the rectum. There was a marked change in the quality of the voice. Neither testis was palpable before or after treatment.

6. Thompson, W. O., and Heckel, N. J.: Undescended Testes: Present Status of Glandular Treatment, *J. A. M. A.* 112: 397 (Feb. 4) 1939.

7. Heckel, N. J.: Production of Oligospermia in a Man by the Use of Testosterone Propionate, *Proc. Soc. Exper. Biol. & Med.* 40: 1 (April) 1939.

point of azoospermia by the use of testosterone propionate. The spermatozoon count returned to normal after the omission of treatment. In other words, in an individual with normal testicular function it would appear that testosterone propionate produces at least a temporary injury to the seminiferous tubules. These results appear to contraindicate the use of male sex hormone in most cases in which the testes are capable of producing spermatozoa. The problem of sterility is a complicated one and its treatment at present unsatisfactory. In some instances deficiencies in quantity and quality of spermatozoa appear to be related to deficiencies in the function of the anterior lobe of the pituitary. Some improvement in therapy may be expected from the development of a more potent gonadotropic factor from the pituitary. The role of the gonadotropic material from the serum of the pregnant mare in the treatment of sterility in the male is still to be determined. The value of the anterior pituitary-like factor is questionable in sterility because it stimulates primarily the interstitial cells.

THE MALE CLIMACTERIC

There is no definite period of loss of sexual function in the male like the menopause in the female. Nevertheless there does occur some waning of sexual activity with advancing years, the age varying tremendously from person to person. More than 50 per cent of men over 70 years of age are reported to show spermatozoa.⁸ Brown-Séquard and others have associated the fatigue and decreased vitality of advancing age with decrease in sexual vigor, and a condition has been described in some males resembling the female climacteric. It is probably true that some men of this type will be helped by male sex hormone,⁹ but the details of this form of therapy are still to be worked out.

IMPOTENCE

The promiscuous use of glandular therapy in impotence is to be deplored. Many cases are psychogenic in origin. The first thing is to determine the cause of the impotence. If it is related to a deficiency of testicular function, then improvement may be expected from glandular therapy which may be of the stimulation or substitution type, depending on the capacity of the testes to respond. One man aged 56 was cured of impotence by the administration of the anterior pituitary-like principle from pregnancy urine in a dose of 1,500 rat units three times a week. Until more is known about the possible harmful effects of this type of therapy in old men it is wise to proceed cautiously.

UNTOWARD RESULTS

Three of our eunuchoid patients (from 18 to 26 years of age) receiving large doses of testosterone propionate have shown transitory edema of the ankles, but during the period of edema they felt unusually well and were very anxious to continue with the treatment. One other eunuchoid patient complained that palpitation and tachycardia were so marked that he had to discontinue treatment for a while. Three old men with prostatic hypertrophy had edema of the ankles and shortness of breath during treatment. Thompson¹⁰ reports the development of generalized puffy edema, acne of the face and trunk and precordial pain. In one of his cases

precordial pain was so marked that treatment had to be discontinued. In younger men the edema may be caused by retention of sodium and other electrolytes, while in older men it may be caused by cardiac failure resulting from increased activity. The patients who are receiving this material must be followed for a long time to determine whether or not there are any untoward late complications.

SUMMARY

1. Testosterone propionate is an important therapeutic agent.
2. Its administration represents primarily substitution therapy, in contrast to stimulation therapy with gonadotropic material.
3. Its use is indicated in conditions in which the testis is incapable of responding to stimulation.
4. Its most important application is in the treatment of castrate and eunuchoid persons.
5. It may cause a marked reduction in the number of spermatozoa in normal men. For this reason it is

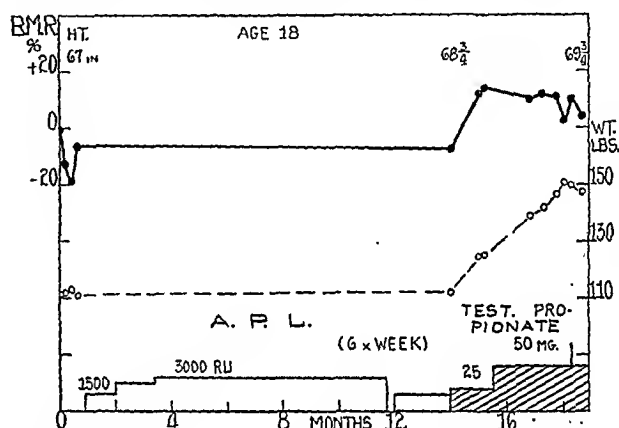


Fig. 4.—Changes in the basal metabolism and weight of the patient during treatment.

contraindicated when the testis is capable of normal function and it is probably of no value in the treatment of sterility.

6. Although it is as effective as the gonadotropic factor of pregnancy urine in undescended testes, treatment with the latter is to be preferred because of possible injury to the testis with male sex hormone.

7. It does not appear to be effective in the treatment of benign prostatic hypertrophy.

8. In the treatment of impotence it is indicated only in those cases in which the natural production of male sex hormone is deficient.

9. Its value in reviving the sexual, mental and physical vigor of old men is still to be determined.

ABSTRACT OF DISCUSSION

DR. ELMER L. SEYRINGHAUS, Madison, Wis.: I feel that there is a very definite clinical syndrome which is coming to be appreciated in larger numbers in the last decade or so under the term male climacteric. It has its drawbacks because there is not the same objective evidence of change which the female shows. However, the experience that I have had in a more limited group of cases than that of the authors' indicates that the testosterone is definitely effective in the relief of subjective complaints, more largely of the psychic complaints than of the autonomic and somatic complaints. The testosterone is being used at a time when there is no desire to stimulate or maintain testicular function, and at a time when prostatic hypertrophy

8. Engle, E. T.: Male Reproductive System, chapter 15 in Cowdry, E. V.: Problems of Aging: Biological and Medical Aspects, Baltimore, Williams & Wilkins Company, 1939.

9. Werner, A. A. The Male Climacteric, J. A. M. A. 112:1441 (April 15) 1939.

10. Thompson, K. W.: Testosterone for Treatment of the Eunuchoid State, J. Connecticut M. Soc. J. 3: 59 (Feb.) 1939.

is common. Since testosterone is a material which is known to stimulate prostatic growth, it must be used with some caution until it becomes known whether it is a factor in stimulating the morbid hypertrophies or malignant diseases of the prostate. I wish it were possible for Drs. Thompson and Heckel to tell about the comparative results between the pregnant urine gonadotropic material which they have used so largely and the genuine pituitary gonadotropic materials. I have long felt that the genuine pituitary material would be preferable in those cases in which the objective is the improvement of fertility, the stimulation of the spermatogenic tissues, since spermatogenic tissues show so little or no response to the pregnancy urine material. I wonder if the authors have enough comparative data on the same patient treated with one preparation for an adequate period and then with the other to know whether one of these preparations, pregnancy urine or pituitary material, is superior, judging either by descent of the testes or by the development of the external genitalia. Another question is about the regression of the gains after therapy is stopped. How much of the gain in size of genitalia, how much of the gain in weight, how much of the gain in behavior remains after testosterone is no longer used? Does this require maintained therapy in the treatment of the eunuchoid? There is almost a corollary to that. What should be the objective in treating a eunuchoid? Is there any reason to develop a bigger penis or to develop more hair to increase the frequency with which a man has to shave? It would be my feeling that the only obvious reason to treat a eunuchoid, granting he is permanently infertile, would be if he is socially handicapped or psychologically handicapped and can be relieved from those stigmas sufficiently to become a more normal member of society.

PROF. ERNST LAQUEUR, Amsterdam, Netherlands: It is a great honor for me to speak in your Association and it is also a great pleasure to me to hear about testosterone, which my collaborators and I developed four years ago. We did not expect directly that this substance would have such great clinical value and that it would be so widely known. It is true that the large number of experimental and clinical trials became possible only after the synthetic preparation of testosterone by the procedures of Ruzicka and Butenandt. There are two questions I want to discuss with Dr. Thompson: (1) testosterone and spermatogenesis and (2) testosterone and prostate hypertrophy. 1. It is important if experimental evidence supports the impression in the clinical application of testosterone that with suitable doses the spermatogenesis is improved. In hypophysectomized rats spermatogenesis ceases unless the rat is treated with testosterone propionate, which prevents the loss of spermatogenesis. Clinical cases are reported in the literature and I have had personal experience with two cases in which moderate doses of testosterone restored spermatogenesis and cured sterility. One case of course gives no absolute evidence, but still it shows that spermatogenesis is not interfered with. 2. The treatment of mice with estrogenic substances induces an enlargement of the prostate and ducts of the seminal vesicles and ductus deferens. There are important structural changes (metaplasia of the epithelium, cornification and the like), which remind one of estrous changes in the vagina; de Jongh spoke about "estrus in the prostate." When with the similar treatment the administration of male hormone is combined, the pathologic changes of the prostate are prevented. This is experimental evidence in favor of the effect of male hormones on the prostate. Prostate hypertrophy can also be produced in young dogs by treatment with estrogenic substances. When this treatment is combined with injections of gonadotropic substances, which stimulate the animal's own testis to produce male hormone, hypertrophy of the prostate can be prevented and the naturally occurring hypertrophy in old dogs can so be cured. In 500 human cases I am informed that in more than two thirds some result has been obtained by male hormone. Such statistics may perhaps be considered as evidence in favor of a treatment such as that of hypertrophy of the prostate with male hormone. The lack of positive results in the authors' patients may be due to the fact that these were late cases, treated as outpatients, while clinical treatment was needed.

DR. WILLARD O. THOMPSON, Chicago: As pointed out in the paper, there probably is a condition in certain aging men in which the use of testosterone may be beneficial, not so much

because it affects their sexual function as because it increases their mental and physical vigor. But I do think that it is important to proceed cautiously, because the tendency is, once a potent material becomes available, to use it in many conditions in which it is not indicated. Dr. Sevringhaus asked if we had any evidence to suggest whether or not gonadotropic material prepared from the anterior pituitary might be preferable to that from the urine of pregnant women. Theoretically, the pituitary material should be preferable because in patients with hypogonadism one is interested not only in increasing the production of androgenic factor but also in influencing the function of the seminiferous tubules. However, there is no gonadotropic preparation of the anterior pituitary at the present time that is potent enough for routine clinical use, and that was why I said I thought that the pregnancy urine material was to be preferred at present, even though it is far from ideal. Dr. Sevringhaus also asked whether the increase in genital growth showed regression when treatment was omitted. Some regression in the size of the genitalia usually occurs after omission of the anterior pituitary-like principle, the extent varying greatly from patient to patient. In persons of the eunuchoid type, the effect of treatment with androgen is dependent on constant stimulation. While I do not know in detail the effects of omission of treatment, it is probably true that these patients will require some treatment throughout life, because the administration of androgenic substance merely represents substitution therapy. The most important aspect of treatment of the eunuchoid state with androgen is its stimulation of mental and physical vigor and production of a normal psychologic and emotional status. The emotional and psychologic changes in eunuchoid persons are very striking. Dr. Laqueur referred to his very interesting work with androgen which we all know about. He spoke about its being better to use small doses. I must say that we had to use very large doses of this material to produce genital growth in eunuchoid persons. As to the effect of this material on patients with benign prostatic hypertrophy, all I can do is to repeat our results, namely, that we have been unable to obtain any objective evidence of beneficial effect.

MANAGEMENT OF BENIGN STRICTURE OF THE ESOPHAGUS

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The frequency with which benign (cicatricial) strictures of the esophagus require dilation has produced the impression among physicians that lesions of this type occur more often than other diseases which cause dysphagia. Contrary to this belief, benign stricture occurs less often than carcinoma and cardiospasm, and with approximately the same frequency as pharyngo-esophageal diverticulum. Although benign stricture from swallowing lye is probably encountered less frequently now than prior to legislation requiring that lye be labeled poison, the total number of proved cases of cicatricial stricture has remained practically constant for the past twenty years. Constancy in the incidence of benign stricture has resulted, no doubt, from more accurate recognition of inflammatory lesions in the esophagus in which the cause of inflammation is not known.

Any inflammatory process involving the wall of the esophagus may produce sufficient contraction when healing occurs to reduce the lumen of the esophagus and interfere with passage of food into the stomach. Since formerly one tenth and now one fifth of benign strictures result from idiopathic inflammatory processes and since progressive dysphagia is the only significant symp-

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tom in this group of cases, it is possible that many lesions which are now recognized as benign were previously considered malignant. Differentiation of benign from malignant stricture may not be possible, and all strictures in the esophagus should be treated as though they were benign unless malignant disease can be proved.

A frequent cause of benign stricture, which was recognized but rarely in the past, is prolonged intermittent ulceration and healing at the junction of the esophagus and stomach that occurs in cases of so-called congenital shortening of the esophagus with hernia of a portion of the stomach through the esophageal hiatus in the diaphragm. Many such cases have been reported as peptic ulcer of the esophagus with formation of stricture.

Stricture from a simple inflammatory process that involves the wall of the esophagus is single and usually located in the lower portion of the organ. When a caustic is swallowed, the lumen of the entire esophagus may become stenosed or there may be single or multiple areas of narrowing. Frequently one of the strictures is in the upper portion of the esophagus. Superficial areas of esophagitis rarely produce sufficient scarring to reduce the lumen of the esophagus and interfere with deglutition. When inflammation involves the muscular layers of the esophagus, contraction occurs and dysphagia follows.

Difficulty in swallowing depends as much on reduction of elasticity of the wall of the esophagus as on actual narrowing of the lumen of the tube. This fact explains the severity of dysphagia in carcinoma when the lumen through the esophagus is fairly large, but elasticity of the wall of the esophagus is greatly reduced, as contrasted with relatively easy deglutition in benign stricture when the lumen is small but the wall more elastic. Infiltration of the muscular layers of the esophagus in carcinoma reduces elasticity of the tube and causes difficulty in swallowing, whereas a patient who has a carcinomatous growth in the esophagus without involvement of the muscular coats may experience little or no difficulty with deglutition. Multiple areas of narrowing in the esophagus may not be associated with a greater degree of dysphagia than is observed in cases in which there is a single stricture.

In burns of the esophagus from ingestion of strong inorganic acid and solutions of lye or ammonia, the severity of the burn is usually dependent on the concentration and amount of solution that has been swallowed. Although this is not always true and severe extensive stricture may follow ingestion of a small amount of caustic, yet patients who have intentionally swallowed a large amount of a concentrated solution of acid or alkali usually have multiple areas of stenosis of the esophagus, if they survive.

One must remember that strictures may occur in the stomach when a large amount of caustic, acid or formaldehyde has been swallowed. Formaldehyde rarely, if ever, produces serious erosion of the esophagus but, when retained in the stomach, it may cause extensive ulceration. In order that strictures in the stomach and especially at the pylorus may not be overlooked, roentgenoscopic examination of the stomach should be made of all patients who have swallowed a large amount of a corrosive substance. In most cases roentgenoscopic study should be deferred until the lumen of the esophagus has been dilated sufficiently to permit free deglutition.

Sodium or potassium hydroxide in granular form is rarely introduced into the mouth except accidentally.

It is seldom swallowed, and burns from it are usually limited to the mouth and lips. Stricture of the mouth may occur following burns of the lips and may require plastic operation. Immediate treatment of an injury of this type consists of removal of as much of the caustic as possible with water and application of olive oil to the burned surface.

When a solution of lye has been swallowed, a large amount of olive oil should be given by mouth and supportive measures should be instituted. It is questionable whether attempts should be made to wash the stomach, because introduction of a stomach tube is associated with trauma. Daily introduction of rubber tubes of increasing size immediately following ingestion of a caustic has been advocated to prevent formation of stricture, but I have not had any experience with this type of treatment. When acid has been swallowed, administration of magnesium hydroxide as an antidote is preferable to sodium bicarbonate.

Regardless of the type of chemical that has been ingested, pain and swelling usually prevent deglutition for three or four days. During this period an adequate amount of fluid should be administered by various routes, especially intravenously. As soon as the immediate inflammatory reaction has subsided, fluid can be taken by mouth, and within a week the patient is usually able to swallow soft food.

As healing progresses, the lumen of the esophagus decreases in size, and within a month or six weeks contraction of scar tissue may become so pronounced that there is complete symptomatic obstruction. If the patient is permitted to reach this stage of dysphagia without having swallowed a thread, gastrostomy may be considered necessary. If, however, a size D twisted silk thread has been swallowed as soon as the initial reaction of the burn has subsided, dilation may be performed when necessary without subjecting the patient to the risk, discomfort and expense of gastrostomy.

When a patient has ingested even a small amount of acid or caustic, a thread should be swallowed and kept in the esophagus until treatment by dilation is required or until it has been determined that a stricture is not present. When the patient is a small child, it is advisable to introduce the thread through a nostril or to withdraw it through the nose after a yard or more has been swallowed, so that the child cannot sever or fray the thread with his teeth.

Even when a patient seems to have complete closure of the esophagus and gastrostomy appears necessary, effort should be made to introduce a thread through the esophagus while fluid is administered preparatory to operation. In most cases a thread will pass through the esophagus although obstruction may seem to be complete, and, as soon as a thread has entered the stomach, fluid can be swallowed. The thread seems to promote passage of fluid through the esophagus just as a urethral filiform bougie facilitates passage of urine through a urethral stricture.

Gastrostomy is associated with a mortality rate of at least 10 per cent and requires hospitalization for ten days or longer. It adds to a patient's discomfort and should seldom be required if a swallowed silk thread is utilized in treatment. Another disadvantage of gastrostomy which is rarely emphasized is that the esophagus may close completely after a tube is introduced into the stomach and the immediate emergency is mitigated. Closure can be averted by having the patient swallow a thread and allowing it to remain in the lumen of the stricture until dilation can be performed. How-

ever, even though this precaution is not observed, complete anatomic stenosis of the esophagus seldom occurs. Recently I observed a patient with cicatricial stricture of the esophagus following ingestion of hydrochloric acid, who had had complete symptomatic occlusion for eight years. Even after this length of time the patient was able to swallow a thread, and normal deglutition has been restored. Gradual dilation of benign stricture of the esophagus with metal sounds will eventually result in restoration of normal swallowing.

Almost all strictures can be dilated to size 30 French at the first treatment, and the size can be gradually increased to 45 French. Not more than one sound should be passed through the esophagus at each treatment, and the interval between dilations and the size of the dilators should be gradually increased. It is advisable to pass dilators from above downward, even when gastrostomy has been performed and the thread

has been withdrawn from the abdominal opening. Passage of large dilators from below upward is attended with greater discomfort and the abdominal wound is subjected to unnecessary trauma.

Esophagoscopy is not necessary in the management of the majority of cases in which there is a benign stricture of the esophagus. Direct inspection of the esophagus is desirable for patients with strictures which may be benign, when the etiology is uncertain, or in instances in which sudden complete obstruction may have resulted from impac-



Appearance of patient mentioned in text, for whom normal deglutition has been restored following complete symptomatic obstruction of esophagus for eight years.

tion of a foreign body within the lumen of the stricture. However, dilation of strictures through an esophagoscope is attended with greater discomfort and risk than when dilators are passed into the stomach over a guiding thread. If gastrostomy is contemplated and the patient has difficulty swallowing a thread, esophagoscopy should be performed to ascertain whether or not the opening through the stricture is sufficiently large to permit passage of a small ureteral catheter which may be used as a guide for introducing dilating sounds into the stomach.

I have not had any experience with the use of heated bougies as suggested by Dean. Cutting of strictures by various methods is associated with unnecessary risk and discomfort. Impermeable stricture of the esophagus is seldom encountered, but, when anatomic stenosis exists, attempts to restore the lumen of the esophagus almost always result fatally. It is my belief that, when the lumen of the esophagus has been obliterated, establishment of an opening through the scarred tissue is impossible. Reconstruction of the esophagus because

of benign stricture has been accomplished in a few cases, but the risk of operation is great and the functional result has not been entirely satisfactory.

SUMMARY

1. Benign stricture of the esophagus occurs less frequently than carcinoma or cardiospasm.

2. In 20 per cent of cases in which there is stricture of the esophagus the cause cannot be ascertained. In these cases carcinoma is usually suspected, and accurate diagnosis may not be possible even following esophagoscopy examination and removal of tissue for microscopic study. Unless carcinoma can be proved, stricture of the esophagus should be considered benign.

3. Congenital shortening of the esophagus with herniation of a portion of the stomach through the diaphragm is frequently associated with stricture at the junction of the esophagus and stomach.

4. When a thread is employed as a guide for passing sounds, a benign stricture can be dilated with a minimal amount of risk and discomfort and with an excellent functional result.

5. Complete anatomic stenosis of the esophagus rarely occurs and can always be prevented by having the patient swallow a thread and allowing it to remain within the lumen of the esophagus until dilation has been accomplished. A patient was able to swallow a thread after having obstruction of the esophagus for eight years. Normal deglutition was restored by gradual dilation of the areas of stenosis.

6. Gastrostomy is seldom necessary in the management of benign stricture of the esophagus and adds to the risk of treatment.

7. In order that stricture at the pylorus may not be overlooked, roentgenoscopic examination of the stomach should be made in patients who have swallowed a large amount of a corrosive substance. Roentgenoscopic study should be deferred, however, until after the lumen of the esophagus has been restored by the passage of sounds.

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ABSTRACT OF DISCUSSION

DR. JOHN H. FITZGIBBON, Portland, Ore.: Important advances in medicine are usually based on simple principles, and I feel that the introduction of the silk thread as a guide in the treatment of stenosis of the esophagus was one of the truly great advances. Regardless of the type of dilator used, the silk thread guide has made the passage of instruments a comparatively safe procedure in experienced hands and has saved patients much unnecessary discomfort and risk. I generally use the metal olive type of dilator originated by the late Dr. B. W. Sippy, because I believe that the piano wire guide, passed over the original silk thread guide, renders the procedure somewhat more safe than the thread alone. However, any one doing this work must be prepared to vary his technique at times, owing to individual peculiarities of the case and sometimes to devise modifications of existing instruments or to originate instruments adapted to immediate needs. Dr. Vinson's reminder that benign stenosis of the esophagus is rarely infrequently caused by conditions other than the swallowing of corrosives deserves attention particularly since congenital shortening of the esophagus is still frequently misdiagnosed. Legislation requiring that preparations containing lye bear a "poison" label has surely reduced the incidence of lesions due to the accidental swallowing of such corrosives. However, such labels have at times led to the taking of lye preparations with suicidal intent. This spring I observed two patients who swallowed drano, an effervescent lye mixture used for clearing out drain pipes. The author has emphasized the fact that

gastrostomy is seldom necessary in cases of corrosion if a thread is swallowed early, and I wish to mention the desirability of early and adequate dilation, especially in children. I have had experience with a few children who were allowed to struggle along on liquids and an inadequate diet for several years, with resultant evidence of developmental deficiency, seen particularly in the teeth. I agree with Dr. Vinson that esophagoscopy is usually not necessary in the management of patients with benign stricture of the esophagus unless there is doubt as to diagnosis or possibility of impaction of a foreign body. Certainly, treatment with a dilating instrument passed over a thread or a piano wire guide is much less uncomfortable and continues to give splendid results with reasonable safety.

RESPIRATORY ALKALOSIS DURING ANESTHESIA

AN EXPERIMENTAL STUDY IN MAN

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Increased pulmonary ventilation in the human individual, whether voluntary or involuntary, is accompanied by a series of biochemical and physiologic changes which are proportional to the intensity and duration of hyperventilation. The resulting symptoms and signs are numerous,¹ but certain of these are reasonably characteristic. Dizziness, blurring of vision, and numbness and tingling of the extremities are frequent early symptoms. Excessive pulmonary ventilation, long continued, results usually in spasms of the muscles of the face, hands and feet. In some persons these signs are accompanied or followed by laryngeal stridor, opisthotonos, generalized convulsions and unconsciousness. Physical and nervous fatigue are common sequels to the episode and may persist for several days.

The exact biochemical basis for these changes in the irritability of nerve cells has not been clearly established. It is probable that some of the symptoms and signs are initiated by the train of events which follow local restrictions in blood flow secondary to the alkalosis. Schneider² and Collier, Densham and Wells,³ among others, have demonstrated a marked peripheral constriction, and it is not unreasonable to believe that a similar constriction may occur in cerebral vessels, since they are known to respond readily to chemical alterations in the blood.

It is apparent from the literature that the integrity of the cardiovascular system as a whole is maintained even during severe respiratory alkalosis. Norlin⁴ has

established that the cardiac output, the pulse rate and the consumption of oxygen increase in proportion to the intensity of hyperventilation. Although Henderson, Prince and Haggard⁵ observed a fall in venous pressure in short experiments, this has not been confirmed by Schneider,² who obtained an increase in both capillary and venous pressure. Arterial pressure changes are insignificant. A slight rise or a slight fall may accompany voluntary hyperpnea⁶ or those clinical states associated with hyperventilation.⁷ We have failed to find a description of cardiovascular changes associated with hyperventilation in man which might be rightfully termed shock, according to the modern definition or usage of this term.

Until recently these relatively minor and seemingly compensable effects of respiratory alkalosis on the cardiovascular system of man were difficult to harmonize with the more profound changes which are observed in the anesthetized animal when the latter is subjected to excessive pulmonary ventilation. Henderson⁸ was the first to describe experiments in which circulatory failure and "fatal apnea" resulted from hyperventilation of the anesthetized dog. These observations served as the basis for his well known theory of acapnial shock. Numerous investigators⁹ have observed the arterial hypotension which he described, but there is no uniformity of fact or opinion regarding the significance of this phenomenon or its relation to shock.

It is now clear that the observed differences in the circulatory response of man and animal were more apparent than real, since recent laboratory studies¹⁰ in the dog in which the maximum pulmonary ventilation compatible with the structural integrity of the lung was maintained for from one to fifteen hours established the fact that "acapnial shock," so called, is a phenomenon of narcosis. Furthermore, the changes in the circulation observed in the anesthetized dog cannot rightfully be termed shock when measured by the accepted standards for this condition, since the arterial hypotension is not progressive and does not significantly affect survival even though the condition may exist for many hours. It is evident that in some of the previously reported experiments trauma must have

5. Henderson, Yandell; Prince, A. L., and Haggard, H. W.: The Influence of Forced Breathing on the Circulation, *J. Pharmacol. & Exper. Therap.* **11**: 203 (April) 1918.

6. Schneider,² Collier, Densham and Wells,³ Norlin.⁴ Henderson, Prince and Haggard.⁵

7. Kerr, W. J.; Dalton, J. W., and Gliche, P. A.: Some Physical Phenomena Associated with the Anxiety States and Their Relation to Hyperventilation, *Ann. Int. Med.* **11**: 961 (Dec.) 1937. Harwood.¹

8. Henderson, Yandell: The Cause and Phenomena of Surgical Shock (Probably Due to a Diminished CO₂ Content of the Blood), *Proc. Am. Physiol. Soc.*, December 1905; *Am. J. Physiol.* **15**: 28 (Proc.) 1906; Acapnia as a Factor in Shock, *Brit. M. J.* **2**: 1812, 1906; Acapnia and Shock: IV. Fatal Apnea After Excessive Respiration, *Am. J. Physiol.* **25**: 310, 1910; Acapnia and Shock: VII. Failure of the Circulation, *ibid.* **27**: 152, 1910.

9. These include:

Janeway, H. H., and Ewing, E. M.: The Nature of Shock: Its Relation to Acapnia and to Changes in the Circulation of the Blood and to Exhaustion of the Nerve Centers, *Ann. Surg.* **59**: 158, 1914.

Dale, H. H., and Evans, C. L.: Effects on the Circulation of Changes in the Carbon Dioxide Content of the Blood, *J. Physiol.* **56**: 125 (May) 1922.

Campbell, J. A.: Carbon Dioxide Tension and Oxygen Consumption During Artificial Respiration, Acidosis and Alkalosis, *J. Physiol.* **57**: 386 (Aug.) 1923.

McDowall, R. J. S.: The Effect of Carbon Dioxide on the Circulation: Part I, *J. Physiol.* **70**: 301 (Oct.) 1930.

Shaw, L. A., and Messer, A. C.: Transfer of HCO₃ Between Blood and Tissues Caused by Alterations of CO₂ Concentration in Lungs, *Am. J. Physiol.* **100**: 122 (March) 1932.

Roome, N. W.: The Cardiac Output in Hyperventilation by External Alternating Pressures, *Am. J. Physiol.* **104**: 142 (April) 1933.

10. Seevers, M. H.; Stormont, R. T.; Hathaway, H. R.; Orcutt, F. S., and Shideman, F. E.: Acapnia and Shock, *J. Pharmacol. & Exper. Therap.* **60**: 117 (June) 1937. Stormont, R. T., and Seevers, M. H.: The O₂ and CO₂ Tension in Tissues Following Prolonged Hyperventilation, *Am. J. Physiol.* **119**: 410 (July) 1937. Seevers, M. H., and Stormont, R. T.: The Relation of Anesthesia to Acapnial Hypotension, *J. Pharmacol. & Exper. Therap.* **66**: 31 (May) 1939. A series of papers by these authors in press, *J. Pharmacol. & Exper. Therap.*

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Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Harwood, R.: Hyperventilation Tetany, *New England J. Med.* **218**: 602 (April 7) 1938.

2. Schneider, E. C.: A Study of the Respiratory and Circulatory Responses to a Voluntary Gradual Forcing of Respiration, *Am. J. Physiol.* **91**: 390 (Jan.) 1930.

3. Collier, R. J.; Densham, H. B., and Wells, H. M.: The Influence of Respiratory Movements on the Cutaneous Circulation, *Quart. J. Exper. Physiol.* **18**: 291 (Dec.) 1927.

4. Norlin, G.: Circulation and Forced Respiration in Man, *Skand. Arch. f. Physiol.* **64**: 239, 1932.

played an important role. The evidence on which these statements are based is as follows:

No significant fall in the arterial pressure (greater than a few millimeters) occurs during excessive mechanical hyperventilation in the unanesthetized dog or during the recovery period from cyclopropane or pentothal anesthesia. The dog is therefore not basically different from man in its response to hyperventilation.

A decrease in arterial pressure, which varies from 10 to 50 per cent of the initial level, almost invariably occurs in the anesthetized dog during hyperventilation irrespective of the type of narcotic used. Furthermore, the degree of arterial hypotension is proportional to the depth of narcosis rather than to the magnitude of pulmonary ventilation. A gradual recovery of arterial pressure occurs during prolonged hyperventilation in the anesthetized dog, so that the original or a greater level is attained after several hours. Fatal circulatory failure during hyperventilation occurred only once in eighty dogs, this animal having a chronically enlarged heart with numerous mitral vegetations. Fatal respiratory failure did not occur in a single animal in this series unless ventilation was so severe as to result in rupture of the lung or in those experiments in which a large quantity of narcotic was purposefully administered just prior to the discontinuance of hyperventilation. Arterial hypotension is not observed in the anesthetized dog during hyperventilation if rise in plasma pH is prevented by gastric perfusion of 0.35 per cent hydrochloric acid, even though arterial carbon dioxide tension may be reduced to 5 mm. of mercury. Anesthetized dogs permanently survive from six to eight hours of the most severe hyperventilation. Hyperventilation tetany does not occur in the anesthetized dog.

Since these experiments establish the fact that narcosis modifies significantly the cardiovascular and respiratory response to respiratory alkalosis in the dog,

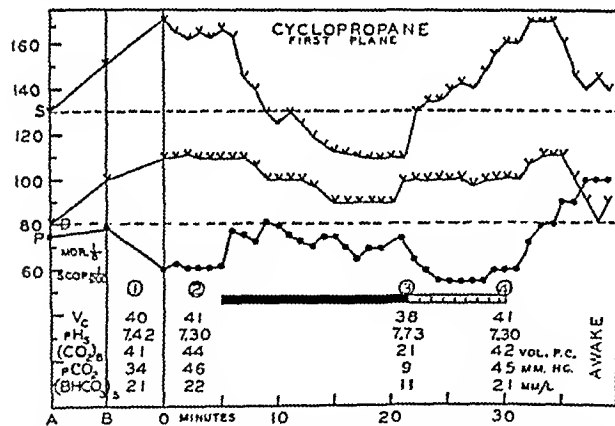


Chart 1.—Hyperventilation with oxygen during cyclopropane anesthesia. S, systolic; D, diastolic arterial pressures; P, pulse; solid block, hyperventilation; block with bars, apnea in minutes; encircled numbers, capillary blood samples; V_c, cell volume per cent; pH_s, plasma pH; (CO₂)_b, whole blood carbon dioxide content, volumes per cent; pCO₂, carbon dioxide tension, millimeters of mercury; (BHCO₃)_b, base bicarbonate, millimoles per liter of plasma.

it becomes pertinent to know whether such is the case in man. We have been unable to find any publications dealing with an experimental approach to this problem, although many of the functional disturbances which occur during or following anesthesia, e. g. circulatory failure and "fatal apnea,"¹¹ atelectasis and pneumonia¹²

and "ether spasm,"¹³ have been gratuitously ascribed to a reduction in carbon dioxide.

Whereas the large majority of all clinical administrations of narcotic drugs are associated with a respiratory acidosis from hypoventilation and the resulting carbon dioxide retention, there are certain circumstances in which hyperventilation may obtain. "Controlled respiration" is now a rather common practice of professional anesthetists. The tendency of novices

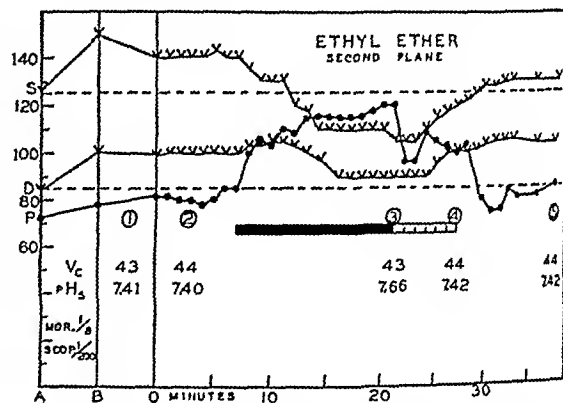


Chart 2.—Hyperventilation with oxygen during ether anesthesia. Legend as in chart 1.

when conducting artificial respiration is to hyperventilate the patient, particularly in emergencies.

The following experiments were therefore designed to study the functional effects of various grades of hyperventilation which might conceivably occur during anesthesia in man:

PROCEDURE

Patients of different age and sex with apparently normal cardiovascular and respiratory systems were selected who were to undergo short operative procedures. Data regarding pulse, arterial pressures and so on were obtained from the clinical record. When it was used, preliminary medication consisted of morphine sulfate and scopolamine hydrobromide in dosage appropriate to the age and condition of the patient. From one and one-half to two hours later, 0.5 to 1 cc. of capillary blood was obtained by finger incision, collected under oil and oxalated according to the procedure described by Shock and Hastings.¹⁴ This and subsequent samples were analyzed in duplicate by the microtechnique of these authors and the following information obtained: hematocrit (V_c); hydrogen ion concentration of plasma (pH_s) [determined at 38 C.]; carbon dioxide content of whole blood (CO₂)_b. Determinations of carbon dioxide were made by the method of Van Slyke and Neill.¹⁵ From these data the carbon dioxide tension (pCO₂) and the base bicarbonate (BHCO₃)_b were calculated by the equation of Hasselbalch as modified by Hastings and Shock.

Several pulse (half minute observations) and arterial pressure determinations (auscultatory) were made at

11. Henderson, Yandell, and Haggard, H. W.: Respiratory Regulation of the CO₂ Capacity of the Blood; II. Low Levels of CO₂ and Alkali Induced by Ether; Their Prevention and Reversal; III. The Effects of Excessive Pulmonary Ventilation, *J. Biol. Chem.* 33: 345 and 355 (Feb.) 1918.

12. Henderson, Yandell: Apnea as a Factor in Postoperative Shock, Atelectasis and Pneumonia, *J. A. M. A.* 95: 572 (Aug. 23) 1930.

13. Collip, J. B., and Backus, P. L.: The Effect of Prolonged Hypoventilation on the Carbon Dioxide Combining Power of Plasma, the Carbon Dioxide Tension of Alveolar Air and the Excretion of Acid and Phosphate and Ammonia by the Kidney, *Am. J. Physiol.* 51: 567, 1917; Kemp, W. N.: Tetany During Ether Anesthesia, *Brit. J. Anesth.* 11: 169 (July) 1932.

14. Shock, N. W., and Hastings, A. B.: Studies of the Acid-Base Balance of the Blood: I. A Microtechnique for the Determination of the Acid-Base Balance of the Blood, *J. Biol. Chem.* 104: 565 (March) 1934; Hastings, A. B., and Shock, N. W.: II. A Nomogram for Calculating Acid-Base Data for Blood, *ibid.* 104: 575 (March) 1934; Shock, N. W., and Hastings, A. B.: III. Variation in the Acid-Base Balance of the Blood in Normal Individuals, *ibid.* 104: 585 (March) 1934.

15. Van Slyke, D. D., and Neill, J. M.: The Determination of Gases in Blood and Other Solutions by Vacuum Extraction and Manometric Measurement, *J. Biol. Chem.* 61: 523 (Sept.) 1924.

one minute intervals before anesthesia. A similar procedure was followed before, during and after hyperventilation. Anesthesia was induced in the supine position with ethyl ether, cyclopropane, tribromethanol 0.1 Gm. per kilogram, sodium amytal 0.01 Gm. per kilogram or morphine 0.08 Gm. and scopolamine 0.002 Gm. in divided doses. An orotracheal airway with cuff was inserted and the latter inflated. It was necessary to cocaine the pharynx and larynx when amytal, tribromethanol or morphine-scopolamine alone were used, in order that the orotracheal tube could be tolerated. The to and fro carbon dioxide absorption technic was employed with the canister placed close to the orotracheal tube to eliminate dead space. In addition to the agent, oxygen and small amounts of nitrogen completed the respired atmosphere except in one experiment in which air alone was used. When anesthesia had been established in a given plane, a second sample of capillary blood was obtained.

Hyperventilation was induced by two operators who alternately produced pressure on the breathing bag and pressure on the chest. The movements of both operators were rhythmic and all pressure changes were developed gradually rather than abruptly. The ventilation rates varied from 16 to 35 per minute. The intrapulmonic pressure developed at inspiration was not accurately determined but the maximum bag pressure varied from 20 to 30 mm. of mercury. An attempt was made to maintain a reasonably constant level of anesthesia (first or second plane) during hyperventilation with ether and cyclopropane, as judged by extrarespiratory signs. This objective was obtained in most instances, but if it varied the depth of anesthesia was decreased rather than increased. The arterial blood content of cyclopropane in one experiment, for example, was 6.9 volumes per cent at the beginning and 4.3 volumes per cent after fifteen minutes of hyperventilation.

The patients were observed closely during the periods of hyperventilation for signs of tetany. A sample of capillary blood was taken just before hyperventilation

had been completed in order to insure a more complete saturation and better equilibrium with the gaseous agents.

RESULTS

Hyperventilation of from eleven to twenty-one minutes' duration was produced in eleven patients. The degree of ventilation in some instances was as intense as could be obtained safely by manual methods. With the technical procedure employed it was impossible to

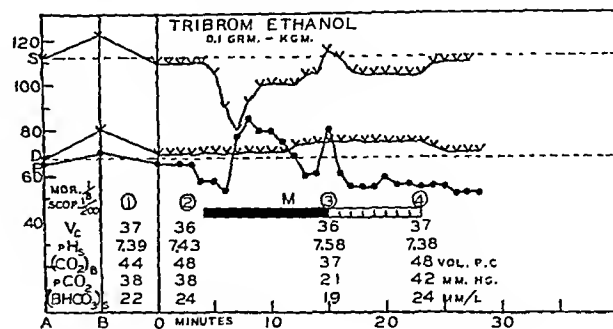


Chart 4.—Hyperventilation with oxygen during tribromethanol anesthesia. Legend as in chart 3.

determine the actual minute volume ventilation. The effectiveness of ventilation was determined entirely by the results of blood analysis. In two experiments, for example, the tension of carbon dioxide in arterial plasma was reduced to 9 and 10 mm. and the pH_s increased to 7.73 and 7.71, respectively. A summary of the results obtained and a characterization of the acid-base displacements are presented in the accompanying tables.

Arterial Pressure.—Systolic: The character of the changes in systolic pressure during anesthesia with different agents will be noted in the charts. The fall is not precipitate as in the experiments on animals, probably because of differences in the intensity of hyperventilation. The slow decrease argues against a mechanical interference with the pulmonary or coronary circulation as a major factor in the arterial hypotension. A casual glance at the curves of systolic pressure in the accompanying charts is apt to be misleading since the final systolic levels during hyperventilation are more readily compared with the elevated levels which obtained during anesthesia. If such a comparison is made, a significant decrease in pressure will be noted in nearly every case, ranging from 2 to 60 mm. and averaging 25 mm. A comparison of the final systolic pressures during hyperventilation with the normal resting values taken before premedication or anesthesia (projected in the figures as the dotted lines) indicates, however, that the change in pressure is much less significant than the former method of comparison would indicate. On the latter basis of comparison, the mean fall with hyperventilation was only 10 mm., the range varying from a rise of 8 mm. to a fall of 25 mm. In no instance did the systolic pressure fall below an absolute value of 92 mm. The skin remained pink, dry and warm and there was no evidence of shock in any subject.

During apnea following hyperventilation, the systolic pressure increased rapidly during the first two minutes and more slowly thereafter until the original or a higher level was attained within a few minutes.

Diastolic: The diastolic pressure, as the systolic, is usually elevated during anesthesia, probably from the accompanying respiratory acidosis. When the final

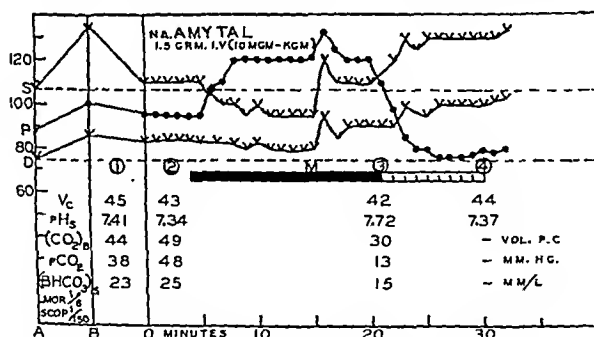


Chart 3.—Hyperventilation with oxygen during sodium amytal anesthesia. Legend as in chart 1. M, muscular activity (see text).

was discontinued. The last few inflations were made with pure oxygen and the bag left half filled with this gas (the pressure did not exceed atmospheric). The chest was exposed and the bag, chest and abdomen were observed closely for the return of activity. With the first spontaneous respiratory movement, the duration of apnea was noted and a blood sample obtained. Observations at one minute intervals were continued for at least twenty minutes after hyperventilation was discontinued and at five minute intervals throughout the subsequent operative procedure. In two cases hyperventilation was performed after the operative procedure

diastolic pressures during hyperventilation are compared with the anesthesia levels it would appear as if respiratory alkalosis is usually associated with a fall in diastolic pressure, since this did occur in eight of the eleven cases. A slight rise occurred in the other three, but the mean for the group was a decrease of 10 mm. As with the systolic, comparisons based on the changes from the normal resting levels of diastolic

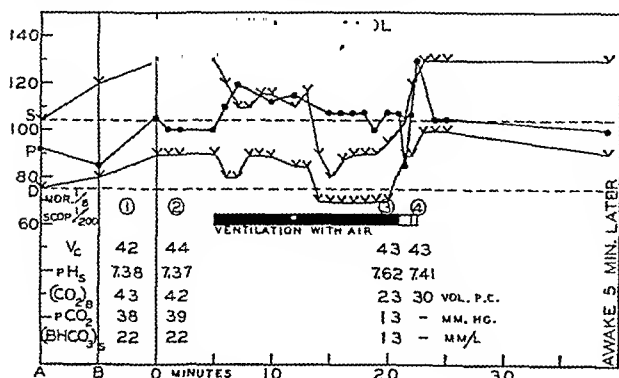


Chart 5.—Hyperventilation with air during tribromethanol anesthesia. Legend as in chart 1.

pressure lead to a different interpretation. Thus, the final diastolic levels, although reduced below the anesthesia levels in eight cases, still remain above the normal resting level in the majority of subjects. The change with hyperventilation varied from a decrease of 6 mm. to an increase of 16 mm., the average being an increase of 7 mm. These results indicate that narcosis of the grade induced in these experiments does not completely prevent the increase in the peripheral resistance which is known to occur in the normal subject during forced breathing.

When hyperventilation is discontinued, the recovery of diastolic and systolic pressures progresses rapidly and in a parallel manner. In some experiments the diastolic pressure increased to a level above the original and remained higher for several minutes after hyperventilation, although the systolic pressure was not elevated above the original level during the same period.

Pulse Pressure: The pulse pressure was uniformly reduced in these experiments but not below an absolute value of 20 mm., except during amylal anesthesia (chart 3). A reduction in pulse pressure is usually interpreted to indicate a diminished stroke volume. Norlin⁴ has shown that forced ventilation in the normal individual is associated with an increased cardiac output which is proportional, within reasonable limits, to the degree of overbreathing. Roome¹⁶ observed values for cardiac output of from 84 to 110 per cent of normal in the hyperventilated dog during anesthesia. Experimentally,¹⁷ it is known that alkalosis increases the tone and irritability of cardiac muscle. It is interesting to note that the larger reduction in pulse pressure occurred during anesthesia with ether (chart 2), amylal (chart 3) and morphine-scopolamine (chart 6). These agents are known to depress the peripheral vagus. The heart rate increase was also larger in these experiments. It is not improbable that the vagal influence modifies the direct effects of alkalosis on the heart and that its removal constitutes a disadvantage.

Heart Rate.—Norlin⁴ observed a uniform increase in pulse rate during forced breathing in the normal subject. No significant change in heart rate was associated with hyperventilation during cyclopropane anesthesia (chart 1), the average value during anesthesia in five cases being 65 and during hyperventilation 70. These slow rates are of vagal origin. A rise of from 20 to 40 beats per minute occurred during ether, tribromethanol and amylal anesthesia. Hyperventilation increased slightly the rapid rate which obtained during morphine-scopolamine narcosis. No arrhythmias were detected by palpation of peripheral arteries during hyperventilation.

The heart rate was usually reduced further or increased slightly in apnea during cyclopropane anesthesia. With the other agents, the rate decreased from the higher level attained during hyperventilation.

Respiration.—The duration of apnea following hyperventilation varied from five to nine minutes in nine subjects who were hyperventilated with oxygen during complete anesthesia. No cyanosis or other alarming signs were observed in any of these subjects before respiration was resumed. It is to be remembered that in these experiments the narcosis was not deeper than second or third plane surgical anesthesia. The long period of apnea is probably related in part to the effects of the anesthetic but in large measure to the fact that the stimulus of anoxia was lacking. Norlin⁴ found that the period of apnea in normal subjects, even after vigorous hyperpnea with air for one hour, was only fifteen to twenty seconds. The results presented here cannot be compared directly with his, however, since the duration of ventilation is different. It has been observed in the dog that the period of apnea becomes shorter as the duration of ventilation is prolonged. Apnea is greatly prolonged in the normal subject if hyperventilation is accomplished with oxygen.¹⁸

The influence of oxygen can be observed readily in two experiments with tribromethanol anesthesia, in

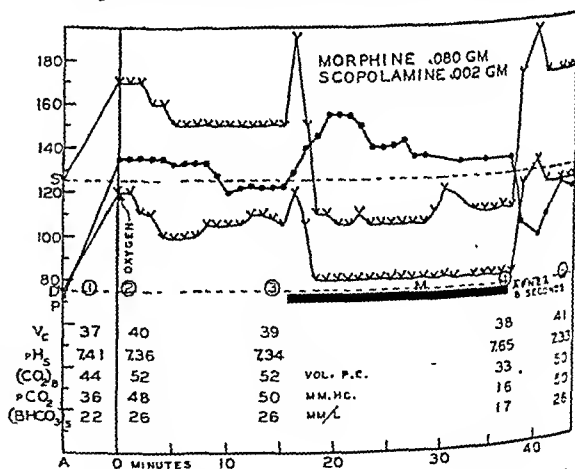


Chart 6.—Hyperventilation with oxygen during morphine-scopolamine narcosis. Legend as for chart 3.

which patient 9 (chart 4) was hyperventilated with oxygen and patient 10 (chart 5) with air. Although apnea lasted eight minutes without cyanosis in patient 9, moderate cyanosis was observed during the ninety-second apnea in patient 10. It is interesting to compare the levels of P_{H_2} and the carbon dioxide at which

16. Roome, N. W.: Cardiac Output in Hyperventilation, *Proc. Soc. Exper. Biol. & Med.* 28: 939 (June) 1931.

17. Jerusalem, E., and Starling, E. H.: Significance of Carbon Dioxide for the Heart Beat, *J. Physiol.* 40: 279, 1910. Schlapp, W.: Adrenalin and Ventricular Fibrillation in the Decapitated Cat, *Quart. J. Exper. Physiol.* 23: 335 (Aug.) 1933.

18. Vernon, H. M.: The Production of Prolonged Apnoea in Man, *J. Physiol.* 38: 18, 1909. Hill, L., and Flack, M.: The Influence of Oxygen Inhalations on Muscular Work, *ibid.* 40: 347, 1910. B. W. M.: Absence of Apnoea After Forced Breathing, *ibid.* 45: 325, 1912.

breathing was resumed in these two cases. In patient 9 both the pH_s and the carbon dioxide content had returned to the levels which obtained before hyperventilation. In patient 10, breathing began while the carbon dioxide content was still 12 volumes per cent below the level present before hyperventilation. It was not possible to calculate accurately the carbon dioxide tension or the base bicarbonate in this experiment because of the oxygen unsaturation of hemoglobin.

In one experiment during morphine-scopolamine narcosis, the period of apnea was only eight seconds although the subject had been hyperventilated with oxygen for twenty-one minutes. This remarkable difference is difficult to explain except on the basis of a scopolamine effect. It cannot be denied that scopolamine exerts an antidotal action on the respiratory effects of morphine in man.¹⁹ It is difficult to believe that such a short period of respiratory arrest would have occurred after 80 mg. of morphine without scopolamine, although the final answer will await experiment. It must be presumed on theoretic grounds that the oxygen delivery to the tissues is reduced in these experiments because of the known shift in the oxygen dissociation curve with alkalosis. It is improbable, however, that tissue anoxia served as the stimulus to breathing in the case with morphine-scopolamine any more than in the experiments involving other agents. Since anoxemia was absent, it is difficult to invoke carotid body stimulation to account for the short apnea in this subject. It is of interest to compare the levels of carbon dioxide and pH_s at which the first breath occurred with the level immediately preceding hyperventilation (table 2). The close similarity in values is striking except in patients 10 and 11. These results indicate further that an anoxic stimulus to respiration was absent in most of the experiments.

At the termination of hyperventilation, the chest was allowed to assume its own position. Whereas this position is the expiratory one and the accessory muscles are relaxed, it is not the type of chest observed with complete intercostal nerve paralysis due to the action of a narcotic drug. The intercostal muscles still retained their tone, and at the first inspiratory effort these muscles, as well as those of the diaphragm, were involved in the respiratory act.

Tetany.—The duration of hyperventilation was similar, and the degree of acid-base displacement was of the same order, or even slightly greater, than that obtained by Shock and Hastings²⁰ during voluntary hyperpnea in man. All of their six subjects but one exhibited tetany. Numerous observers have reported tetany following hyperpnea, whether induced voluntarily²¹ or as a result of anxiety states or disease.²² Tetany or muscle movement did not accompany hyperventilation during cyclopropane or ether anesthesia. Evidently the depressant effects of these narcotics are sufficient to prevent entirely the increased muscular activity.

Although the characteristic tetany was not observed, flexion of the thighs on the trunk occurred, a Babinski

reflex was present, and tendon reflexes were exaggerated during hyperventilation with tribromethanol anesthesia. During anytal anesthesia, hyperventilation induced flexion of the legs and fingers although the patient was in third plane anesthesia as judged by respiratory signs, preceding and following hyperventilation. During morphine-scopolamine narcosis, movements of large muscle groups and rigidity of the limbs were noted. The patellar and triceps reflexes were exaggerated and a Babinski reflex was present. When muscular activity was present during hyperventilation, it was invariably associated with a rise in both systolic and diastolic arterial pressures. This rise was sustained for several minutes. One subject vomited during very light cyclopropane anesthesia after eight minutes of ventilation. The arterial pressure immediately rose to levels considerably above the original.

All of the agents used in these experiments, with the exception of morphine-scopolamine, prevent the tetany of alkalosis. This observation casts doubt on the concept that respiratory alkalosis is an etiologic factor of significance in "ether spasm" or general convulsions during deep anesthesia with ether or other agents.

Hematocrit.—Since hyperventilation was done with an atmosphere saturated with water vapor, the fluid loss during hyperventilation was probably small, and the hematocrit values should be of interest. Almost without exception there was a slight decrease in cell volume. Whereas this change is not large and may not be significant, the trend is indicated. These results differ from those of Shock and Hastings, who noted an increase in cell volume in the unanesthetized subject. Since their subjects were presumably losing water through the lungs, the blood concentration may possibly be accounted for on this basis. It is possible that oxygen played a role, since a slight rise occurred in patient 10, who was hyperventilated with air only.

Base Bicarbonate (alkali reserve).—The base bicarbonate was reduced significantly during hyperventilation. This is due in part to an appreciable increase in acid metabolites such as lactic acid²³ and the ketone bodies.²⁴ At the end of the period of apnea in these experiments (except the morphine-scopolamine case) the base bicarbonate had returned to the prehyperventilation values. If hyperventilation had been continued longer, a certain portion of the base would undoubtedly have been eliminated in the urine or lost to the tissues, and the recovery of the original level would probably have been slower. During ether anesthesia the elevation in plasma pH was not as great as that obtained in other experiments although the hyperventilation was equally severe. This may be due to a greater production of acid metabolites. In this experiment, values for base bicarbonate were not obtained since ether interferes with the analysis for carbon dioxide.

General Effects.—No untoward effects were observed as a result of these procedures. Some of the subjects hyperventilated during cyclopropane anesthesia were awake within five to ten minutes after resumption of spontaneous breathing. Films of the chest taken before and after hyperventilation during ether anesthesia were identical in clarity although the usual postoperative elevation of the diaphragm was noted. The post-

19. Waters, R. M.; Bennett, J. H., and Leigh, M. D.: Effects on Human Subjects of Morphine and Scopolamine Alone and Combined, *J. Pharmacol. & Exper. Therap.* 63: 38 (May) 1938.

20. Shock, N. W., and Hastings, A. B.: IV. Characterization and Interpretation of Displacement of the Acid-Base Balance, *J. Biol. Chem.* 112: 239 (Dec.) 1935.

21. Grant, S. B., and Goldman, A.: A Study of Forced Respiration: Experimental Production of Tetany, *Am. J. Physiol.* 52: 209 (June) 1920.

22. Schneider, P., Henderson, Prince and Haggard,³
23. Bielschowsky, P., and Mandowsky, C.: Ueber Zustand und ure-Basengehaltgewicht bei der Pathogenese der Ztschr. f. klin. Med. 114: 470, 1930. Harwood,³

23. Kodera, K., and Sugimoto, H.: Der Kohlehydrat- und Gasstoffwechsel im Muskel bei Hyperventilationsalkalosis, *Tohoku J. Exper. Med.* 24: 37 (Sept. 28) 1934.

24. Frank, E., Leiser, R., and Weisz, S.: Ueber die Bedeutung der Ueberventilationslactacidurie (lactacidaemia) ihre klinische Bedeutung, *Ztschr. f. klin. Med.* 111 K., and Butt, G.: Untersuchungen ueber die Hyperketonamie bei Hyperventilation und anderen alkalotischen Zuständen, *ibid.* 123: 764, 1933.

operative course was uneventful in all patients. Electrocardiographic records were taken at one minute intervals during hyperventilation and continuously during the period of apnea in patient 10. When hyperventilation was discontinued, the pulse rate was reduced within thirty seconds from 115 beats to 85 beats a minute. Two ventricular extrasystoles were noted at this time. These were the only arrhythmias which were observed and were probably of vagal origin. During hyperventilation the T wave disappeared. Barker, Shrader and Ronzoni²⁵ have described recently a flattening of the T wave during alkalosis from hyperventilation or alkali administration.

COMMENT

The results presented here do not lend support to a hypothesis of shock based on acapnia as originally defined. The term acapnia has been studiously avoided in the present discussion. While the word as originally used had a precise though limited meaning, it has come to be a term without definition, convenient in its vagueness for the designation of any state of decreased vitality. Henderson¹² says:

The most practical definition of acapnia is that of an acute condition involving disturbances and depression of various functions, all of which are relieved and restored to normal by the inhalation of carbon dioxide.

This is an unfortunate state of affairs, since by such a definition it is difficult to establish an adequate rationale for the therapeutic use of carbon dioxide. Although carbon dioxide in certain concentrations serves as a pharmacologic agent and stimulates specific groups of nerve cells, the deduction that the initial cause of the nerve cell depression is a "carbon dioxide deficit" is difficult to justify. It would be as logical to state that epilepsy is due to a deficit of phenobarbital, since the latter compound is effective in the treatment of this condition.

Narcotic drugs depress certain physiologic mechanisms which allow the non-narcotized individual to compensate, in part at least, for a rapidly induced respiratory alkalosis. The circulatory changes and general signs which occurred in these experiments were in no respect comparable to those of traumatic or surgical shock, although the rapidity and extent of carbon dioxide loss greatly exceeds that which is likely to occur in clinical practice. It appears to be reasonable to take the position that the adverse effects of respiratory alkalosis on the circulation or on the general vitality, even during anesthesia, have been overemphasized. When these observations are correlated with those from the literature, the apparent differences between the response to respiratory alkalosis of the dog and man no longer exist, since without narcosis, and in these experiments even during narcosis, a significant arterial hypotension does not occur. The experiments presented here were of relatively short duration. The results obtained are so similar to those obtained in the dog that it seems safe to infer that a gradual recovery of arterial pressure would have occurred with longer hyperventilation, and that a similar and immediate return to normal would have been observed when hyperventilation was discontinued.

SUMMARY

Eleven subjects were manually hyperventilated for periods of eleven to twenty-one minutes during anesthesia with different agents.

A marked respiratory alkalosis was developed, the average increase in plasma pH being 0.31 unit from anesthesia level and 0.25 unit above normal level.

The carbon dioxide tension in arterial blood was reduced, on the average, 21 mm. below the mean level during anesthesia and 31 mm. below the mean normal level before anesthesia.

Systolic and diastolic arterial pressures were reduced during hyperventilation from the elevated levels of anesthesia, the average decrease being 25 mm. systolic and 10 mm. diastolic. The decrease from the normal systolic levels before anesthesia, however, averaged only 10 mm., whereas the mean change in diastolic pressure was an increase of 7 mm. above the normal before anesthesia.

The initial arterial pressures were reestablished rapidly when hyperventilation was discontinued, and no adverse effects on the circulation or general condition of the patient followed hyperventilation.

The duration of apnea varied from five to nine minutes without accompanying cyanosis when hyperventilation was performed with oxygen. In one subject hyperventilated with air, apnea lasted one and one-half minutes and was accompanied by moderate cyanosis.

Cyclopropane and ether prevented entirely the tetany of alkalosis, whereas amytal, tribromethanol and morphine-scopolamine did not entirely prevent, but modified, the character of the muscular phenomena.

CONCLUSIONS

These data, when compared with the effects of voluntary hyperpnea in man and correlated with the results of carefully controlled mechanical hyperventilation of anesthetized and unanesthetized dogs, prove that the arterial hypotension due to the rapid removal of carbon dioxide is a phenomenon which obtains only during anesthesia. Furthermore, it is incorrect to classify this hypotension as surgical shock, since (a) the hypotension is not progressive, (b) recovery of arterial pressure occurs even during continued ventilation and, (c) when hyperventilation is discontinued, recovery is immediate.

ABSTRACT OF DISCUSSION

DR. HENRY K. BEECHER, Boston: This field, as the speaker has pointed out, is extremely confused. It is stated that "the two greatest errors in the use of carbon dioxide in anesthesia consist in attempts to superimpose a respiratory acidosis on an acidosis of metabolic origin, and its use in asphyxial states in which blood and tissue tension of carbon dioxide are already so high as to be at a depressant level." It must be granted that carbon dioxide unwisely used may produce toxic effects. The use of carbon dioxide by anesthetists occurs chiefly on two occasions: To promote induction and to speed up recovery. Occasionally patients are encountered who are slow to be anesthetized. The induction may be speeded up in two ways: By increasing the concentration of the anesthetic agent; this has obvious drawbacks. By increasing the respiratory minute volume by the use of carbon dioxide; this seems to be the more desirable alternative. The desirability of using carbon dioxide can be determined in a given case by a simple physiologic test: Suppose carbon dioxide is added to the inspired gases to the extent of 5 per cent for one minute. If the patient is in the critical condition described, the addition of the carbon dioxide should further depress him and it can then be stopped, without serious effect. If, on the contrary, the respiration is stimulated by the use of a low percentage of carbon dioxide is permissible for the few minutes required to complete the induction, for if a seriously high blood carbon dioxide level had existed, the respiratory stimulation would not have occurred. Hyperventilation leads to considerable circulatory disturbance. The safety of hyperventilation is questioned by their finding that one dog in eighty did have a fatal circulatory failure. Apparently

25. Barker, P. S.; Shrader, E. L., and Ronzoni, Ethel: Effects of Alkalosis and Acidosis on the Human Electrocardiogram, *Am. Heart J.* 17:169 (Feb.) 1939.

dog had a diseased heart. When one considers the ease with which cardiac disease can be overlooked in man, doesn't this at least offer a warning? "Controlled respiration," that is, the production of apnea and the placing of the respiration at the discretion of the anesthetist, removes one of the most valuable safeguards of the circulation. The gradual onset of respiratory failure and ultimate respiratory paralysis are of importance as warnings that the blood concentration of the anesthetic agent is getting too high for circulatory safety. These warnings are of importance for the expert and are indispensable for the less than expert. Ten cases seems too few to allow any certainty of conclusion as to the effects of hyperventilation under a specific anesthetic agent. This remark is emphasized when it is recalled that several anesthetic agents are concerned in the ten cases. This paper shows that in ten cases shock did not occur as a result of hyperventilation during anesthesia. It is a step toward the elimination of misconception as to the limits of usefulness of carbon dioxide.

DR. M. H. SEEVERS, Madison, Wis.: We are not advocating hyperventilation as a procedure in anesthesia; we have merely made an experimental attempt to establish whether or not hyperventilation, even to the maximum which can be obtained by ordinary clinical procedures, produces a shocklike state. If we may be allowed to draw an analogy with the effects on the dog, I might say that such a shocklike state does not occur in a dog even though hyperventilation is conducted for eight or ten hours. The animals recover after this period even though the pressure of carbon dioxide in arterial blood is maintained at as low as 8 mm. I think the deleterious effects of carbon dioxide loss on the cardiovascular system have been greatly over-emphasized.

AVITAMINOSIS OCCURRING IN DIABETIC PATIENTS UNDER INSULIN THERAPY

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The frequent occurrence of glossitis and stomatitis in persons with diabetes is a matter of common knowledge. The usual explanation of such lesions, particularly when complicated by monilial or spirochetal infection, has been "lowered resistance" or "a toxic state" due to hyperglycemia. Since the type of glossitis and stomatitis usually seen in diabetes is in all respects similar to that seen in mild endemic pellagra or in acute pellagra secondary to parenteral nourishment with dextrose solutions, it seems probable that the cause may be an avitaminosis caused by abnormal carbohydrate metabolism. Three cases recently observed would seem to substantiate this hypothesis. In two instances, signs of avitaminosis developed when carbohydrate intake and insulin dosage were rapidly increased; in the third, signs of nicotinic acid and riboflavin deficiency were present on admission, disappeared for a short time under an abundant diet and small doses of insulin but recurred when the diet and the insulin were increased.

REPORT OF CASES

CASE 1.—L. S., a white woman aged 58, admitted to the hospital Jan. 10, 1939, was known to have diabetes and had been observed in an outdoor clinic and was well maintained over a long period on a diet containing 70 Gm. of protein, 70 Gm. of fat and 150 Gm. of carbohydrate with 45 units of protamine zinc insulin daily. Her present complaint was an abscess of the left side of the neck of one week's duration. She was admitted to the surgical service, where it was found

that she was well nourished and developed with an obvious deep infection of the left side of the neck. General physical examination was not important. The blood showed 9.2 Gm. of hemoglobin per hundred cubic centimeters and 4,100,000 erythrocytes and 8,400 leukocytes per cubic millimeter. The blood sugar was 200 mg. per hundred cubic centimeters. The urine showed large amounts of sugar and "2 plus" acetone. The diet and insulin that had sufficed for control were continued. The abscess was incised and drained on the day following admission and an attempt was made to control glycosuria and ketosis with added dextrose and insulin. Because the patient became disoriented and glossitis developed she was transferred to the medical service January 30. On transfer she was disoriented and actively delirious; the tongue was bright red and atrophic and it was thought that she had pellagra. Nicotinic acid was given intravenously, 200 mg. a day for seven days. During this time she became quite rational and the glossitis healed. Because of persistent hyperglycemia and glycosuria protamine zinc insulin was increased on February 6 to 50 units, on the 13th to 60 units and on the 18th to 65 units. On the 20th severe glossitis recurred, and on the following day ulceration was added to the fiery redness of the tongue. Nicotinic acid was given, 100 mg. daily by mouth from February 20; there was rapid resolution of glossitis and stomatitis and improvement in appetite. On the 26th it was noted that the tongue looked normal. On this day the diet was reduced to protein 40 Gm., fat 40 Gm. and carbohydrate 120 Gm., and protamine zinc insulin was reduced to 50 units. Nicotinic acid was discontinued. Improvement continued and on March 6 protamine zinc insulin was reduced to 40 units with good control of the diabetic symptoms. The patient has continued to be well controlled from the standpoint of her diabetes, and glossitis has not recurred.

CASE 2.—M. H., a white woman aged 67, admitted Jan. 30, 1939, complained of pain in the right hip joint. She was known to have had diabetes for ten years and had been well maintained on a diet containing protein 40 Gm., fat 70 Gm. and carbohydrate 100 Gm., with protamine zinc insulin 25 units daily. Three years ago she suffered a fracture of the right femur and had been ambulant on crutches since; a week before admission she fell again and thereafter was unable to use the right leg. Examination showed that she was well developed and slightly obese, with a second fracture of the right femur. She was slightly disoriented and there was some redness of the tongue. The blood showed 10.2 Gm. of hemoglobin per hundred cubic centimeters and 4,350,000 erythrocytes and 9,500 leukocytes per cubic millimeter. The blood sugar was 280 mg. per hundred cubic centimeters. The urine showed large amounts of sugar and acetone. She was given appropriate orthopedic treatment and continued on the same diet and dosage of insulin that had sufficed at home, but delirium continued and there was persistent hyperglycemia with glycosuria and ketosuria. February 7 she was transferred to the medical service, where it was found that the tongue was bright red and fissured and that diabetes was not controlled. Diet was continued as before and protamine zinc insulin was increased to 45 units a day. Nicotinic acid was given intravenously, 100 mg. a day on February 7, 8 and 9, with marked improvement in the mental state and of glossitis. Glycosuria and hyperglycemia persisted, and the dose of protamine zinc insulin was increased on February 13 to 50 units, on the 15th to 55 units and on the 18th to 65 units. On the 18th the tongue became fiery red and the patient was again disoriented, glossitis grew rapidly worse and delirium developed, requiring restraint. On the 20th nicotinic acid was given by mouth, 100 mg. daily. By February 24 there was some improvement in glossitis, and delirium had cleared so that the patient could go without restraint and sat up. Because glossitis persisted nicotinic acid was increased to 200 mg. a day on March 3, 300 mg. on the 5th and 400 mg. on the 7th. Following the last increment of nicotinic acid there was rapid paling of the tongue and some regeneration of papillae. Diabetes was entirely controlled by diet and the amount of insulin given and the patient was dismissed March 13.

CASE 3.—K. W., a white woman aged 58, admitted March 1, 1939, complained of an ulcer on the right great toe. Before admission it had been found that she had severe glycosuria and

ketosuria. She was slightly obese and well developed. There was edema of the ankles and feet. The mouth showed deep fissures at the commissures of the lips with slight reddening and desquamation of the mucocutaneous junctures. The tongue was red and atrophic. The heart was moderately enlarged with a soft systolic murmur at the mitral area and a much accentuated aortic second sound. The blood pressure was 176 systolic, 110 diastolic. There was moderate vaginitis with a seropurulent discharge. The blood contained 13.5 Gm. of hemoglobin per hundred cubic centimeters and 4,600,000 erythrocytes and 9,000 leukocytes per cubic millimeter. Blood sugar was 330 mg. per hundred cubic centimeters. The urine showed large amounts of sugar and a trace of acetone. The diet prescribed contained 50 Gm. of protein, 50 Gm. of fat and 150 Gm. of carbohydrate; 15 units of protamine zinc insulin was to be given each morning. Insulin was increased March 4 to 25 units and on the 6th to 40 units to control glycosuria and hyperglycemia. The tongue and labial lesions healed rapidly during the first three days of treatment so that on March 6 the fissures at the corners of the mouth were healed and the tongue was of normal color. March 9 there was sudden recurrence of the commissural fissures, which were extremely painful, and the tongue was again red and tender. March 11, 10 mg. of riboflavin was given intramuscularly and, because no improvement was noted by March 13, 25 mg. was given by the same route. By March 15 the fissures at the corners of the mouth were healed but the tongue remained very red and somewhat tender. Protamine zinc insulin was increased on March 17 to 50 units and the diet was augmented by 10 Gm. of protein and 20 Gm. of carbohydrate. On March 19 the rhagades reappeared and the tongue was more red and painful. Riboflavin was given by mouth, 20 mg. a day from March 19 to March 25. There was improvement in the cheilitis on March 24 and by the 27th the right corner of the mouth was entirely healed; the left remained slightly red. Nicotinic acid was begun on March 26, 100 mg. a day by mouth. The tongue was pink and of good texture by March 29 and the fissures at the left oral commissure persisted. It seems likely that the marginal stomatitis will recur.

COMMENT

Two patients with complications of diabetes developed clinical signs of pellagra when the carbohydrate content of the diet was increased, and added insulin was administered to assure utilization of the augmented diet. In both cases nicotinic acid controlled the glossitis and mental symptoms but when carbohydrate or insulin was again increased the symptoms recurred and were again relieved by nicotinic acid. One patient who probably had an inadequate diet at home showed evidence of both nicotinic acid and riboflavin deficiency on admission. On a therapeutic diet with small amounts of insulin, signs of avitaminosis disappeared but recurred promptly with increase in the dose of insulin. Riboflavin given intramuscularly seemed to cure cheilitis but there was a prompt relapse after insulin was increased. Riboflavin and nicotinic acid seemed to cause much improvement in the signs and symptoms of avitaminosis. It would seem likely that rapid metabolism of carbohydrate such as is secured in diabetic patients by the use of insulin causes correspondingly rapid depletion of coenzymes and may in this way produce signs and symptoms of avitaminosis. There is at present no adequate explanation of the occurrence of avitaminosis under such conditions except that suggested. Since the diets given these patients were adequate in all vitamins, the question of inadequate absorption or storage must be given consideration. More important would seem the fact that coenzymes I and II both contain nicotinic acid, and it is quite possible that the great increase in dextrose metabolism caused by relatively large amounts of insulin might exhaust the body stores of this vitamin. The results of vitamin therapy in the cases under consideration would seem to confirm this hypothesis.

Since this report has been in preparation, observations have been published indicating that coenzymes are much depleted in diabetic patients with severe ketosis.¹ The experience of these authors in this work would seem to corroborate the conclusions that we have reached. Severe ketosis may follow exhaustion of coenzymes and logically might be expected to do so. Under chronic conditions, signs of avitaminosis might be expected to appear, with or without ketosis, when unusually rapid dextrose metabolism is brought about by the use of insulin.

HYPOSPADIAS

OBSERVATIONS ON ITS SURGICAL CORRECTION

CHARLES MORGAN MCKENNA, M.D.

CHICAGO

The best evidence that no standard operation for the correction of the hypospadiac deformity has been recognized by the surgical profession is the variety of methods employed by different men to achieve the same end result. It is obviously impossible in a short article such as this one to name all the authors who have contributed to this field, but one should mention Duplay,¹ Ombredanne,² Thiersch,³ Nové-Josserand,⁴ Bucknall⁵ and Beck⁶ among the older writers and Blair,⁷ Cabot,⁸ Cecil,⁹ Crabtree,¹⁰ Hagner,¹¹ O'Connor,¹² Lowsley,¹³ Higgins, Clinton Smith¹⁴ and Young¹⁵ among the later writers.

IMPORTANCE OF CORRECTING THE PENILE CURVATURE

There are two prominent features of every hypospadiac deformity: the defective urethra and the ventral curvature of the penis. There may be other associated pathologic changes such as undescended testicles, but the two conditions mentioned are found to some degree in every case.

My purpose in this paper is not so much to deal with the construction of a new urethra as to emphasize the necessity for correction of the curvature of the penis before attempting to form the new urethra. The amount of curvature of the penis varies in different

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From the College of Medicine and the Research and Educational Hospitals of the University of Illinois.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

The testosterone propionate (perandren), which was valuable in the author's end results, was supplied by the Ciba Pharmaceutical Products, Inc., Summit, N. J., through Dr. E. Oppenheimer.

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cases, usually being most marked when the urethral opening is farthest from the glans, that is, the perineal type. According to some authors this curvature is due to a thickening and contraction of Buck's fascia, while others contend that it is due to a lack of development of the corpus spongiosum, since there is no urethra present. Whatever the exact cause, a firm inelastic cord is present on the ventral surface of the penis which, as the corpora cavernosa develop, tends to pull the distal end of the penis downward and inward, curving it as a bow-string bends a bow. As the corpora cavernosa lengthen during erection, the curvature is of course much exaggerated, causing the penis to assume the shape of an inverted U.

Sometimes the shortening is not sufficiently marked to cause curving when the penis is flaccid but on erection a curve or crook appears. Sometimes the urethral opening may be quite close to its normal location and the possibility of this curving on erection is not thought of. It is a point that must be exactly determined before any plan of procedure is formulated.

When one reviews the literature, including the textbooks, it is interesting to note how little attention is given to correction of the deformity as compared to the enormous space given over to discussion of the

worse than before the operation had been done. The patients were little if any better off than they were before the surgical intervention. Uncritical examination of these cases would lead one to believe that they were good end results and probably were so considered by the surgeons responsible. The adult patients, however, felt otherwise.

OPTIMAL AGE FOR OPERATION

I believe that age is an important factor in the results in this work. In my experience, from 12 to 14 years seems to be the proper time to begin. However, I have seen children who at 11 years and occasionally earlier had genitalia and sex characteristics as well developed as those of a child of 14. Therefore the individual conditions present in any case govern the decision as to the optimal time for surgery. The younger the child, the more difficult the operation, because the parts are small and less easily managed. In cases in which the tunnel graft method is used to correct the curvature it may be performed when the boy is from 8 to 10 years old and the urethral reconstruction postponed a few years.

TESTOSTERONE AS A PREOPERATIVE MEASURE

In a number of cases we have used testosterone propionate (perandren) judiciously. When the genitalia are small and the urethral opening is far back in the perineum, the use of testosterone propionate may be

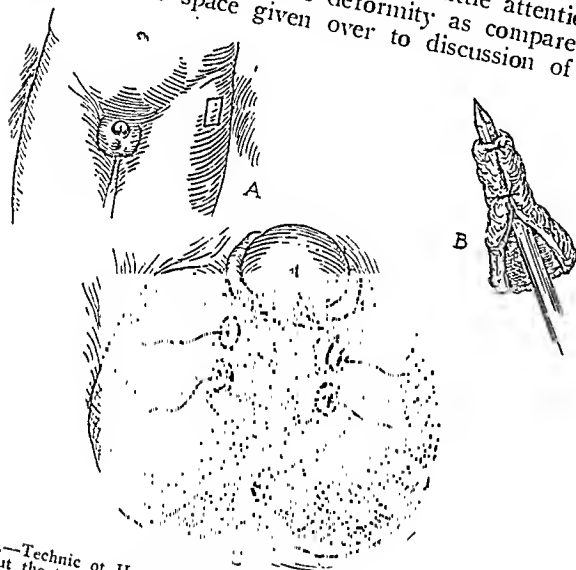


Fig. 1.—Technic of Hagner's tunnel graft method for correction of the ventral curvature. A, donor site for the graft; B, forming the graft into a tube about the trocar; C, tubular grafts in place; D, opening the tubular grafts at the second stage; E, tubular grafts opened out, adding to the length of the ventral surface of the penis.

methods of urethral reconstruction. The penis serves two purposes: it is primarily an organ of copulation and only secondarily, however conveniently, a drain for the bladder. Therefore in the surgical correction of hypospadiac deformities both these functions must be kept in view, and in the order of their relative importance.

Too often the construction of the urethra is the only phase thought of, or else the correction of the curvature is considered a minor preliminary to the urethral plastic operation and is given scant care and attention. In our clinic at the Illinois Research and Educational Hospitals we have seen many patients who had had good anatomic reconstructions of the urethra elsewhere but in whom good functional results had not been achieved. This was due to the fact that, while the urethra came to the end of the penis, the urethra was so short that some still had to sit down to urinate, and even those who could urinate standing found normal erection impossible. Some patients said that the curvature was

indicated. It not only develops the genitalia but tends to bring the urethral opening forward, both of which results simplify the construction of the new urethra. Often a hypospadiac child of 14 years will have genital organs of a size normal for a child of 7 or 8 years. The value of the intelligent use of this drug in these cases should be emphasized.

THE TUNNEL GRAFT METHOD OF HAGNER

Correction of the Deformity.—My first work on the correction of the downward curvature was patterned after the tunnel graft method of Francis Hagner. It was in most cases satisfactory but it necessitated at least two operations before the desired correction was obtained. As many as four tunnel grafts were sometimes necessary to accomplish the desired correction and obtain a penis that was straight when in erection. Some of the grafts were less satisfactory than others, owing to the amount of slough and the time before the denuded area was epithelized.

Dr. Vincent J. O'Connor and I, independently of each other, began using the tunnel graft at about the same time. We have operated on about the same number of patients with this method and a comparison of our results show that they are equally satisfactory.

The Hagner Technic.—This method utilizes free whole-thickness grafts of hair-free skin. As stated, this work may be done a little earlier than the urethral construction, depending on the size of the penis. An attempt is made before the time of operation to estimate the number of grafts that will be necessary. Each tunnel graft should add from 1 to 1.5 cm. to the length of the ventral surface of the penis.

An area on the thigh is selected which is as hair free as possible (fig. 1 A). A 16 F. trocar is used to introduce the grafts, and the size of the graft is determined by wrapping gutta-percha or metal foil around the trocar and cutting a pattern of the proper size. A

it is probably best to introduce only two at one sitting and do the others later.

The graft is left in place about three weeks. Then the tube is opened out by making a transverse incision

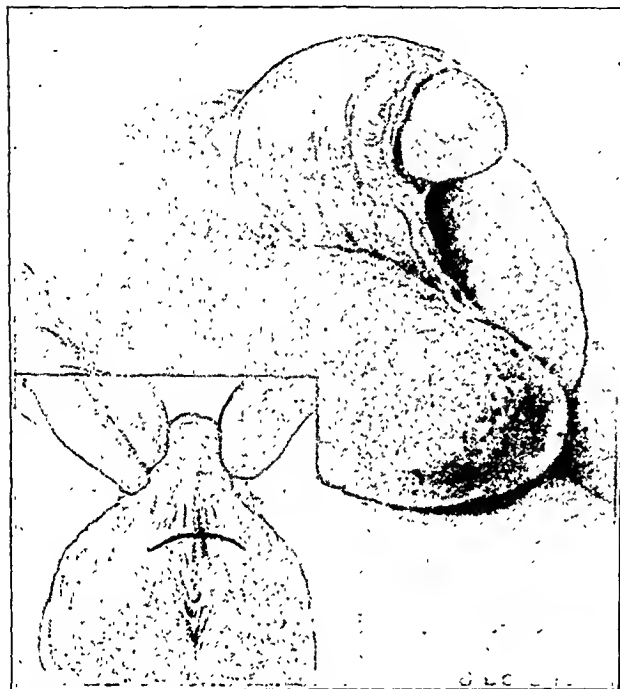


Fig. 2.—Transverse incision for dissection of the fibrous tissue.

piece of skin the size of the pattern is then dissected up from the donor site previously selected. In the original Hagner work some fat was lifted with the skin. We remove the skin with as little subcutaneous tissue as possible and it has proved more advantageous.

The skin graft is then wrapped around the trocar with the cutaneous surface inside and the edges sutured together with interrupted sutures of fine chromic catgut (fig. 1 B). In this way a tube of skin is formed. The trocar carrying the graft is then pushed transversely through the penis beneath the fibrous cord on the ventral surface. It is necessary to make a small incision on each side of the penis at the points of entrance and exit of the trocar. The tubular graft is so oriented that the suture line is nearest the ventral surface of the penis. The trocar is then removed and the ends of the tube are sutured to the edges of the cutaneous incisions on each side with a few interrupted silk sutures. A piece of silkworm gut is threaded through the tunnel and left in a large loop to keep the opening clear for drainage of any blood or serum that might otherwise collect (fig. 1 C). When more than two tunnel grafts are necessary

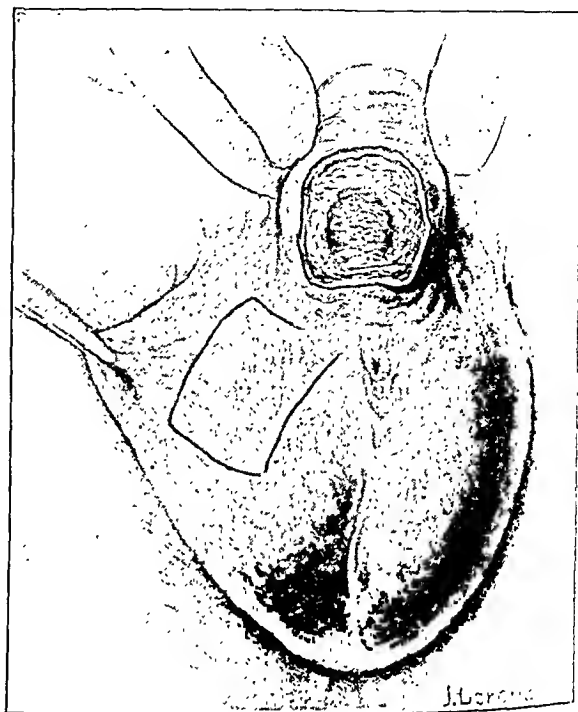


Fig. 3.—Large defect after fibrous tissue has been removed at the site of the pedicle graft.

through all the tissues between the tube and the ventral surface of the penis (fig. 1 D). The raw edges are sutured and the penis is bandaged in hyperextension

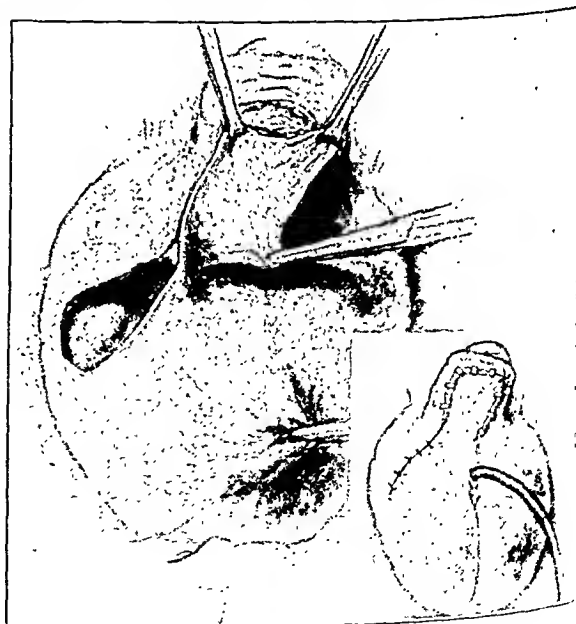


Fig. 4.—Pedicle graft swung in place and sutured.

and kept so until healing is complete. When these tunnels are opened the fibrous cord is cut and an epithelialized area equal in length to the circumference of the tube is added to the ventral surface of the penis (fig. 1 E). All of our cases in which the tunnel graft technic

was employed were successful except one. In that case three grafts were used. One sloughed out to such an extent that it was necessary to put in another graft.

PEDICLE GRAFT TECHNIC

Because of the multiple operations sometimes necessary we devised a new technic; at least it was new to us. A transverse incision was made on the ventral surface of the penis and the contracted fibrous tissue was carefully dissected out down to the corpora cavernosa (fig. 2). This left a large skin defect about 2.5 cm. wide by 2 cm. in length (fig. 3). This was a rather large area to cover by drawing the skin together from the sides as in the classic method which is advocated by almost every author except Hagner and Smith. Large tension relieving Heineke-Mikulicz incisions would be necessary on the dorsum of the penis, and these would shorten the foreskin so much as to make it practically

RECONSTRUCTION OF THE URETHRA

As stated at the beginning of this paper, it is not my purpose to dwell on this aspect of the problem of reconstruction of the urethra but merely to emphasize a few points which I have found most important. The correction of the curvature should always be done first and a sufficient length of time allowed to intervene before any work is done on the urethra. This is necessary to determine whether the result is satisfactory or not. If it is not, further corrective measures can be taken. Never should the urethral plastic operation be attempted at the same sitting as the correction of the curvature. What appears to be an adequate correction of the curvature at the operating table may prove afterward to be woefully inadequate. Also it has happened that surgeons purposely avoided correcting the curvature because in so doing the urethral deformity would be increased and the urethral reconstruction made more difficult. A urethral meatus that is 2 cm. from the glans in the hypospadiac penis may

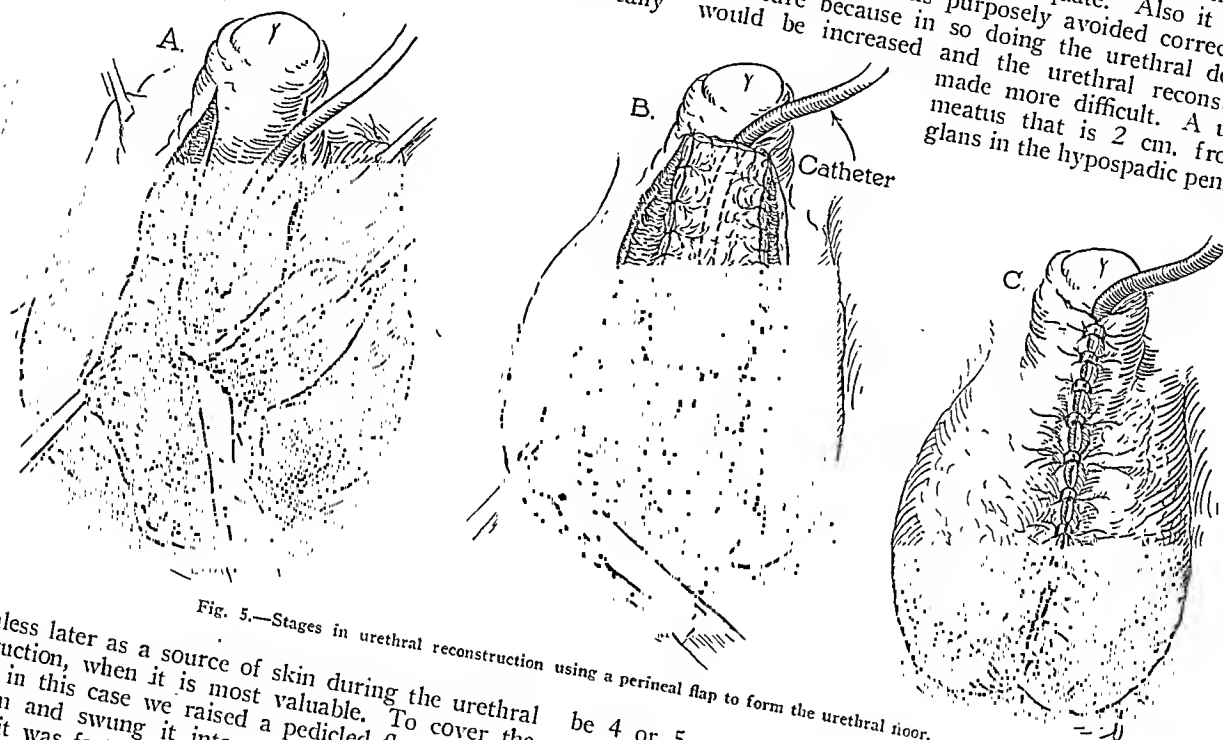


Fig. 5.—Stages in urethral reconstruction using a perineal flap to form the urethral floor.

worthless later as a source of skin during the urethral construction, when it is most valuable. To cover the defect in this case we raised a pedicled flap from the scrotum and swung it into position over the defect, where it was fastened in place by means of skin clips (fig. 4).

This technic has been successful every time I have used it. I have had one case since in which I reverted to the Hagner technic. The contracted fibrous tissue extended so deeply and seemed so firmly attached to the corpora cavernosa that I feared it would be impossible to dissect it free without too much injury to the corpora. I used the tubular grafts instead. Even when these have to be put through the corpora cavernosa themselves there are no bad after effects that I have seen.

In bringing the pedicle graft from the scrotum, as previously described, it is simple to make the graft wide enough so that the skin may be used in building the new urethra, as described by Smith.

The pedicle graft in my hands has been more simple and has required less hospitalization for the patient than any other technic I have used. The hospital stay is reduced to eight or ten days at the most.

be 4 or 5 cm. from the glans after the curvature is corrected. Obviously, such an attitude is inexcusable and should be heartily condemned.

DIVERSION OF THE URINARY STREAM

Diversion of the urinary stream, except by catheter in the immediate postoperative period, is not necessary during the operation for correction of the curvature. Any attempt at urethral reconstruction requires urinary diversion as an essential preliminary. I believe that suprapubic cystostomy is preferable in most cases because with it no urine gets beyond the internal sphincter into the urethra. There is no tube in the posterior urethra to cause the inevitable catheter urethritis and the possibility of contamination of the operative field with the resulting secretions or urine leaking around the tube. I have not tried Young's method of ligation of the bulbous urethra distal to the urethrotomy but I would expect it to be followed by stricture.

URETHRAL RECONSTRUCTION OPERATIONS

The number of different operations for the construction of the urethra is enormous. Which one is best suited in any certain case depends on the extent of the

urethral defect, the condition of the available tissues and the experience of the operator with the different methods. In the balanic type the foreskin may be buttonholed and is an excellent source of skin either for construction of the urethra or for covering of bare surfaces. In the penile type if the urethra is not too far back the foreskin is again available. The Ombrédanne operation is probably the most foolproof in the less severe penile types but has the objection of giving a bulbous rather than a tubular urethra and a much less satisfactory cosmetic result. In the perineal type I have used the method of Crabtree, in which the roof of the urethra is formed of penile skin and the floor of the proximal segment of the urethra is formed of a flap of skin from the perineum posterior to the meatus (fig. 5). A foreskin flap can be used to aid in building the distal segment. One should not try to make flaps too long. Recently I attempted correction of a cleft scrotum and made the perineal flap too long, with the result that a portion of the distal end sloughed. It is better to make the flaps in stages to permit good vascularization and avoid such occurrences. Lowsley's method of making the urethral tube in the perineum and then fastening the penis over it before severing the tube from its original bed assures a good blood supply.

HAIR FOLLICLE DESTRUCTION

There are a few other points to which I would call attention. Skin that is going to be used in the construction of the urethra must have all the hair destroyed. This means not only removed but the follicles destroyed. Older authors recommended surgical removal of the follicles. I refer all my cases to a dermatologist, who destroys the follicles by electrolysis. An interval should elapse to see whether there is any regrowth or new



Fig. 6.—End result in case of perineal hypospadias.

growth and if so that too must be destroyed. A perfectly formed urethral tube can be a constant source of annoyance if hair inside is constantly becoming encrusted.

THE USE OF SKIN CLIPS

Another point seldom emphasized is the use of skin clips on all external suture lines, especially in the urethral reconstruction. They do not have a tendency to cut through as do fine sutures if much edema occurs. They do not penetrate the skin and therefore do not leave a tract to predispose to the formation of fistulas.

Truly enough, they do not hold as well as sutures under tension, but in urethral plastic work there should be no tension. Tension is an invitation to failure.

PEDICLE FLAPS IN CLOSING FISTULAS

Despite all care, small fistulas will sometimes occur to mar an otherwise excellent result. They may delay repeated attempts at closure because the thinness of the tissues prevents suturing in more than two immediately adjacent layers with superimposed suture lines. In these cases, after the defect is closed in the urethral lining a pedicled flap from the scrotum can be used to cover the bare area. This prevents superimposing the suture lines. It was immediately successful in a case of mine in which several attempts had been made to close a persistent fistula in an otherwise good urethra which had been constructed elsewhere.



Fig. 7.—End result in case of penile hypospadias.

SUMMARY

1. In the operative correction of hypospadias, both the sexual and the urinary function of the penis must be given consideration.
2. Complete correction of the ventral curvature should precede any attempt to reconstruct a new urethra. Failure to do this may render valueless all later work.
3. The age at which this work is done depends on the size and development of the genitalia and must be decided individually in each case.
4. In those cases in which the scrotum and penis are small, the judicious use of testosterone propionate may be indicated.
5. The selection of the method for reconstructing the urethra depends on the conditions present. There is no "best" operation for all cases.
6. Diversion of the urinary stream, preferably by suprapubic cystostomy, should precede any attempt at urethral reconstruction.
7. Skin clips are preferable to sutures in all external lines of closure.
8. All hair follicles must be completely destroyed in those areas of skin used to form the urethral tube.
9. Tension must be absolutely avoided in all plastic procedures.

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ABSTRACT OF DISCUSSION

DR. CLINTON K. SMITH, Kansas City, Mo.: The correction of the deformity seems such an obvious procedure that one wonders why it has received so little attention. I strongly suspect that the more fascinating part of the procedure, the plastic formation of a urethra, has overshadowed the less spectacular but nevertheless more important job of correcting the deformity. I should like to emphasize the importance of making an initial success of each successive step of the procedure. For instance, if a surgeon finds it necessary to reoperate to get sufficient correction of the deformity, he finds himself handicapped by the formation of scar tissue, which complicates the situation. I think that in this respect an overcorrection at the

time of the first sitting probably is one of the best forms of insurance. I like to have available at that time prepared skin grafts in order that, if it becomes necessary to denude the ventral penile surface, I can proceed with confidence, knowing that available material is at hand to cover the defect. These flaps should be attached without tension. In some of my earlier cases I had some discouraging experiences with sloughing skin grafts. I naturally fell into a plan of preparing skin grafts. This is done by taking up a section of skin on the scrotum or the foreskin and making a tube of it, allowing it to vascularize, and then later on detaching one end by slow constriction with a small rubber band. After the skin graft has been seasoned in this manner it can be manipulated with impunity, and one is practically 100 per cent certain that the graft is going to stick. There is one other point and that is the matter of the urethral opening, which is often of pinpoint caliber. This should be enlarged at the beginning and kept enlarged during the process, because in my experience the small opening, if left small, is productive of difficulty in the passing of sounds afterward.

DR. VINCENT J. O'CONOR, Chicago: The important point in the whole subject of hypospadias is rarely if ever mentioned. This is the necessity for proper correction of the penile deformity; as urologists, and therefore consultants in sexual matters, we see many persons who come to maturity with good plastic urethral construction but with an erect penile deformity which prevents intromission. It has occurred to me that the surgeon who performed the original corrective measure was either not aware of the importance of straightening the penis prior to remaking the urethra or else was interested only in the position of the urethral meatus. In my private practice I have seen sixteen patients who had so much penile deformity after a good reconstruction of the urethra done elsewhere that marriage was impossible. The severe deformities in these cases are the result of a thickening in the floor of Buck's fascia, and a simple dissection which merely frees the corpora cavernosa, as practiced by most surgeons, does not correct the deformity. The Hagner tunnel graft, which is placed directly through the corpora and permits ultimate incision of the thickened fascia, is the only method that will result in a correction of the severe type of deformity. As urologists who more keenly appreciate this problem, we should emphasize this most important point to those who operate on young boys at an age when this problem is not so apparent.

DR. VILRAY P. BLAIR, St. Louis: The principles of the plan that I have used for thirty years and modified from time to time contemplate three separate operative steps, or more when needed. The principles underlying the plan are: 1. (a) Release of the ventral or dorsal shortening by painstaking dissection and removal of the fibrous sheet that is closely adherent to the corpora cavernosa, the traction of which causes ventral bowing in the hypospadias or total shortening and weakened action of the vesical sphincter in the epispadias. (b) Immediate ample coverage of the resulting raw area with tissue drawn mesially from the body of the penis and pedicle flaps from the prepuce. It is from this covering that the lining of the new urethra will be constructed at the second step. 2. (a) Construction of the missing section of the pendulous urethra, either to the frenum or to the tip of the glans over a section of soft catheter of a size proportionate to the patient's age. (b) The resulting raw surface is immediately covered by a scrotal flap with a base much wider than its length. 3. The base of the scrotal flap is cut free, and the still remaining scrotal part of the urethral defect is closed. If done carefully on a patient who has not been circumcised, this procedure will give an anatomic restoration which is close to normal excepting that the new urethra will not be fixed to the corpora cavernosa. I believe that successful healing will depend largely on the following essentials: 1. Control of all bleeding by triple 0 silk ties. 2. Carefully placed superimposed deep and superficial rows of fine silk sutures in each suture line that insure deep approximation of flap edges. 3. Avoidance of superimposed suture lines. 4. Drainage by an indwelling catheter. I have discarded both cystostomy and urethrostomy in favor of indwelling catheter drainage, which I have found on the average to be the least of three evils. I

prefer that the latter remain in place from five to ten days. This is particularly desirable when the same catheter also supports the newly sutured urethra. 5. Choice of dressings. I rely chiefly on snug double spica-banded pressure dressings which splint the penis firmly against the abdomen or perineum to prevent accumulations of blood and control both infection and priapism, using gauze for wound protection and moist sea sponges for padding pressure. 6. Age of patient at operation. For the psychology of parents and patients I consider it a distinct advantage to complete the repair before puberty and have succeeded in doing this as early as 7 years. The hospitalization for the first step will average around one week and for the second and third steps, which are done with a minimum of an interval of three weeks, between ten and fourteen days each. An indefinite period elapses between the first and the second step.

DR. FREDERIC E. B. FOLEY, St. Paul: I will discuss only the problem of reconstructing the urethra. For many years I fussed with all the trick flaps, hair-bearing skin, prepuce and scrotum familiar to all of us. This was attended by all the difficulties referred to in Dr. McKenna's paper and in the previous discussion. Almost invariably it was a matter of four or five procedures, secondary closures of little fistulas, hair growing in the new urethra and so on. My results corresponded fairly well to other results and photographs which I have seen but not to the illustrator's drawings. For me the whole enterprise was beset with difficulty, and it was not a gratifying experience. A year ago Virgil Counseller called my attention to McIndoe's operation—a modification of the tube inlay graft of Nové-Josserand. I was aware of the original Nové-Josserand operation and of the fact that it gave very poor results owing to contraction and cicatrization of the inlay tube graft. McIndoe avoids this difficulty by keeping a removable mandril in the transplanted skin tube for several months. I tried the method. It has been a very gratifying experience. The operation for correcting the ventral curvature deformity should be done at an early age and repeated until a straight penis is obtained. The plastic operation to form the urethra must not be done until the penis is of near adult size. A special instrument is required. It consists of a metal tube size F. 24 and 10 or 12 cm. long. To one end of the tube is screwed a solid spear-pointed end; to the other end is screwed a handle. The spear-pointed end is pushed along under the skin of the ventral surface of the penis from the hypospadiac meatus to the glans, where it emerges in the position of a normal meatus. The spear-pointed end and handle are then unscrewed, the metal tube being left in the position of the new urethra. A thin sheet of skin cut from a non-hair bearing surface is wrapped around a catheter of size F. 20 or F. 22—"butter side out" of course—and is held in place with ties. This tube graft carried on the catheter is passed into the metal tube to the appropriate position. The metal tube is then withdrawn over the catheter, the tube graft being left in the grip of the surrounding structures. Ten days later the catheter is removed, the transplanted skin tube being left in place as a new urethra. For from eight to ten months the patient must wear an obturator in the newly formed urethra to prevent its contraction. A segment of soft rubber catheter serves this purpose well and causes no discomfort. At the end of this period the procedure is completed by anastomosing the hypospadiac meatus with the proximal end of the tube graft. By this method I have obtained by far the best result.

DR. CHARLES M. McKENNA, Chicago: The majority of patients suffering with hypospadias will sooner or later have an inferiority complex. This is usually true in any deformity of the genital organs. The patient should be encouraged rather than discouraged. Surgeons doing this type of work must be prepared for some grief, since the result will not be perfect in all cases. I think this should be explained to the family so that the impossible will not be expected in one sitting. Careful attention should be given to the blood supply to make a good result possible. When a graft is being made all tension should be relieved so that slough may be prevented. The technic is not the same on all patients. In other words, the fundamentals will be used but the technic will vary according to the type of deformity which confronts the surgeon.

Clinical Notes, Suggestions and New Instruments

STUDY OF A MALE CASTRATE

LAURENT FEINIER, M.D., AND THEODORE ROTHMAN, M.D., NEW YORK

Despite published evidence to the contrary, a rather common belief persists that complete castration of the adult male results in impotence.

For many years it has been known that the sexual impulse tends to continue in animals after castration. Sexual instinct and potency often persist in the ox and the gelding.

Havelock Ellis¹ reported that many castrated men continued to possess sexual impulses, as noted by medical observers in countries where eunuchism was produced and eunuchs were employed. McCartney² reported that ten of the twenty-three eunuchs examined by him showed gonorrhea. Osman and Schukru³ reported the continuation of sexual instincts and successful efforts in eunuchs. The earlier the age at which castration is performed the less marked the subsequent sexual desire, and the Chinese regarded boys castrated before the age of 10 as particularly pure and virginal.

Lange⁴ reviewed more than 300 cases of soldiers who had been castrated during the World War as a result of bullet wounds or tuberculosis. Of the 220 who were unmarried at the time of castration, 155 have married and "not a few did not notice any impairment of libido for many years and potency remained for a long time, although in a generally decreasing way." Kolle⁵ reported a series of fifty-eight surgically castrated men in at least a third of whom libido and potency appeared to be preserved. In contrast are the reports of de Quervain and Wolf⁶ at Berne and of Goll⁷ in Denmark, who reported consistent and almost entire suppression of libido and potency. The report from Berlin that a large proportion (possibly 30 to 50 per cent) of castrated criminals previously guilty of sexual offenses did not become repeaters is obviously open to psychiatric interpretation rather than complete acceptance on the basis of physical and hormonal mechanisms. Rowe and Lawrence⁸ reported a case of successful mental readjustment and sexual success in a surgically castrated man 25 years of age, whereas McCullagh and Renshaw⁷ reported loss of libido in nine of twelve adult male castrates.

Not unrarely, patients suffering from certain mental diseases seek and even demand castration and after the procedure may derive some temporary relief from mental conflicts and anxieties. Unwise and hazardous as such therapeutic procedure usually is, it is somewhat surprising to discover how frequently it has been rationalized and recommended by physicians. As Menninger⁸ has described, castration is even comparatively recently reported in the *Quarterly Cumulative Index Medicus* as a possible form of therapy for neurosis, perversions and sexual abnormalities, sexual crimes, mental diseases and tuberculosis.

The overemphasis which has been placed for so long on the gonads as the main source of potency and libido in males is certainly not in accord with general medical knowledge con-

cerning female castrates, who so often after surgical or x-ray procedure retain complete libido and ability for sexual responses.

Following is a report of long retention of sexual prowess in a surgically castrated man:

REPORT OF CASE

History.—A. I., aged 53, was admitted to the Vanderbilt Clinic because of severe periodic headaches occurring from twice a week to once a month, usually confined to one side of the head but often bitemporal and frontal and usually lasting from twelve to forty-eight hours. Either during or after the headaches, the patient was usually nauseated and vomited. The onset occurred thirty years previously, three to four months after complete orchidectomy for gonadal tuberculosis. One testicle was removed in a New York hospital and a few months later the other was removed in Naples, Italy.

At 7 years of age the patient had a convulsion without known cause. In the next year and a half several other seizures occurred, following which there was no further recurrence. He was considered a "weak and sickly" child.

The patient's mother suffered headaches of a type similar to his own. A sister was operated on for trigeminal neuralgia. His maternal grandmother became psychotic during the latter part of her life.

Previous to the surgical castration thirty years before, the patient had sexual intercourse about once a month and considered his potency and prowess rather poor. Nevertheless, three children were born. Subsequent to the removal of the second testicle his libido and potency promptly became definitely increased and in the words of his wife, to whom he had been married four years, "he was like a newly married man." The patient stated that thereafter he enjoyed his marital relationship more thoroughly and robustly until the past six months, during which the periodic headaches became more severe and more frequent and he had intercourse about once a week. There was no ejaculation other than a "few drops of sticky fluid."

Physical Examination.—The patient was well nourished, weighing 179 pounds (81 Kg.), cooperative and fairly intelligent. The habitus was feminine, with increased fat distributed about the breasts, hips and abdomen. The mammary areas were definitely enlarged. Pubic hair distribution was of the feminine type. The eyebrows were rather heavy and prominent. There was no evidence of testicular tissue. The voice was soft and modulated. The patient was polite, modest and courteous, with at times a suggestion of effeminate mannerisms.

There was no evidence of organic involvement of the nervous system, mouth, heart, lungs or abdomen.

The genito-urinary consultant was Dr. Leonard Hallock. He found no testicular tissue. The prostate as felt by rectum was very small and flat, not unlike many prostates in normal persons with normal testicles. The evidence of atrophy of the prostate was in accord with the cases reported by McCullagh and Renshaw, as was also the comparatively normal size of the penis.

The endocrine consultant was Dr. Irving Pardee. The skin was smooth with a slightly yellowish tinge. It presented a scanty line of hair on being stroked. The hair growth throughout was scanty; a beard was present but not profuse. Pubic hair was transverse and scanty. There was no mammary development, only fat. There was no structural change in the body or change in the voice. Dr. Pardee stated that the retention of libido is not unusual in these cases; as it had been reported in the literature and seen in one of his cases. He felt that the headaches in the present case were characteristically pituitary in type and location, being bitemporal and frontal. Their onset after orchidectomy and the undoubted "proliferation of castration" and its counterpart in the castration cells of the pituitary linked up this syndrome.

Laboratory Examination.—The blood count was normal. Blood chemistry showed a urea nitrogen level of 11.4 mg. urea 24.4 mg. and sugar 96 mg. per hundred cubic centimeters.

From the Neurological Department of the Vanderbilt Clinic and the Neurological Institute of New York, service of Dr. Henry A. Riley.

1. Ellis, Havelock: *Studies in the Psychology of Sex*, Philadelphia, F. A. Davis Company, 1901-1931.

2. McCartney, J. L.: Dementia Praecox as Endocrinopathy with Clinical and Autopsy Reports, *Endocrinology* 13: 73-87 (Jan.-Feb.) 1929.

3. Osman, Mazhar, and Schukru, Ihsan: Les eunuques: Etude anatomoclinique et anthropologique, *Hyg. ment.* 31: 33-45 (Feb.) 1936.

4. Lange, J.: Kastration vom Standpunkt des Psychiaters, *Med. Klin.* 30: 1081-1084 (Aug. 17) 1934.

5. Problems of Heredity, Berlin letter, *J. A. M. A.* 105: 1051-1052 (Sept. 28) 1935.

6. Rowe, A. W., and Lawrence, S. H.: Studies of Endocrine Glands; Male and Female Gonads, *Endocrinology* 12: 591-662 (Sept.-Oct.) 1928.

7. McCullagh, E. P., and Renshaw, J. F.: Effects of Castration in Adult Male, *J. A. M. A.* 103: 1140-1143 (Oct. 13) 1934.

8. Menninger, K. A.: Polysurgery and Polysurgical Addiction, *Psychosom. Quart.* 3: 173-199 (April) 1934.

The Wassermann reaction of the blood was negative. The dextrose tolerance values were 92, 102, 82, 96, 102, 112 and 62 mg. The basal metabolic rate, determined on three different occasions, was —13, —10 and —20 per cent.

The determination of the gonad stimulating factor called "prolan" was 4 plus on two occasions and subsequently negative on two occasions.

Dr. Hugh H. Darby of the Department of Biological Chemistry, Columbia University College of Physicians and Surgeons, found no evidence in the patient's urine of the presence of either testosterone or androsterone. The extract and concentrate from 3,000 cc. of the urine when injected into capons produced no comb growth.

X-ray examination showed a normal skull. The sella turcica did not show any abnormalities.

Psychologic and Neurologic Examination.—The Arthur tests showed that the patient's intelligence quotient was 80. His English vocabulary and educational background were limited. Responses to the Rorschach ink blots suggested a reasonably good intellectual endowment and a neurotic tendency.

Masculinity-femininity tests (Terman and Miles⁹) resulted in a suggestion of a slightly feminine type, but the trend was not considered significant, the patient's reactions being standardized at the more feminine end of the masculine range.

Some degree of neuropsychiatric hereditary background was noted in the family history. The patient was one of ten children and in childhood was apparently overprotected by too solicitous parents. As a result of his convulsive seizures he was refused admission to school and keenly felt his social isolation and situation of insecurity. At puberty he began autoerotic practices, which were continued through late adolescence. Later, minor difficulties were experienced in adjustment to work and to social life. His courtship and marriage were apparently normal and, although the subsequent weakness in heterosexual relationship might be interpreted as a result of neurotic mechanisms, it could be attributed to the tuberculosis of the testicles. Preoperatively the patient had considerable fear of castration. He had been told that complete loss of virility would result. However, he had a strong erection on the fourth day after the removal of his second testicle. His continued potency and the gain in weight, although the latter was largely contributed to by increased adiposity around his breasts and pelvic girdle, was followed by his explanation that he "was stronger and more of a man than ever before."

During hospitalization no discrepancies in his ward conduct were noted. He was affable, showed considerable innate intelligence, had a good sense of humor and showed considerable pride in his one time association as secretary to a famous male singer. His behavior showed none of the profound mental changes which Rowe¹⁰ has reported may occur in male castrates.

COMMENT

The rather abrupt increase in sexual activity and prowess in this patient following castration was probably favorably influenced to some extent by the removal of the tuberculous foci.

It is possible that a compensatory Don Juan reaction to a castration fear in a person of a neurotic type might have played a secondary part in his sexual rejuvenation, but it is believed that the patient's increase in libido and potency was a compensatory mechanism in his unconscious for his castration. Psychically he gained something because of the loss of his testicles. He believed that he had grown heavier and therefore stronger and had proved he was more of a man. This obviously was a form of rationalization on the patient's part, although the favorable physical and psychic results following the removal of the tuberculous foci can by no means be entirely

discounted in attempting an interpretation of his subsequent reactions. Subsequently his position as secretary to a famous singer served to improve and maintain his morale. In psychiatric summary, this patient resembled the six patients with eunuchoidism studied by Carmichael and Kenyon¹¹ in that he did not reveal any characteristic mental picture, which is in accord with the opinion of Löwenthal¹² (as mentioned by these authors) that the sexual defect is the one feature which eunuchoids share in common. It would appear that adult castrates may vary as widely in their personal reactions and mental adjustment to orchidectomy as do people in general to the various other difficulties in life.

The development of physical characteristics suggestive of eunuchism appeared directly dependent on the castration, the resultant lack of testis hormone or hormones and the subsequent endocrine imbalance. Admitting the possibility that there may have been some testis or testis-like hormone in the patient's food supply, the capon tests for male hormones gave negative results. Although he was not castrated until 23 years of age the patient's physique supports the view that adequate gonadal activity is not only necessary for reproductive function but may also, even as comparatively late as young adulthood, be necessary for the complete development and the full maintenance of normal physical characteristics.

The rather low basal metabolic rates are in accord with pathologic-anatomic data reported by Wagenseil¹³ and the reports on eunuchoids by Carmichael and Kenyon¹¹ and on castrates by McCullagh and Renshaw.⁷

Although the patient's mother suffered periodic headaches of a type somewhat similar to his own, the onset a few months after castration in this case supported an interpretation that he suffered a lack of gonadal secretion and its inhibitory effect on the anterior pituitary. The gonadotropic substance found on several occasions and the bitemporal and frontal location of the headaches also confirmed the indictment of the pituitary gland as a factor.

The therapeutic response to ergotamine tartrate and phenobarbital was satisfactory, with no occurrence of severe headache for three weeks, whereas before admission he had been having a severe attack about twice a week.

The patient's conduct and behavior reactions, although slightly suggestive of the feminine type, were not sufficiently so to permit any definite deductions or conclusions. His emotional instability and neurotic tendency appeared as a result of his sickly childhood and the overprotection he received from a too solicitous mother.

This case is of interest in connection with the reports in the literature which have described the therapeutic use and value of testicular extracts in male adult impotence. It suggests that such beneficial effects are the probable result of either a gonadal suppressive action on the pituitary or, in some instances, a favorable psychogenic reaction.

It appears that in the full-grown adult the only indispensable sexual function of the testes is that of procreation and that libido and potency are functions of and controlled by the pre-pituitary and the psychic centers.

After puberty and adolescence with the development of the male sexual characteristics, castration need not result in the loss of libido and potency, nor are prominent mental or physical changes a necessary aftermath. Retention of sexual power probably depends to a considerable extent on the subject's pre-operative mental characteristics, type of personality pattern and tendency either to resign himself passively to his sexual defect or else combatively to compensate for it. Neuropsychiatric supervision of these cases should be of considerable value in

9. Terman, L. M., and Miles, C. C.: *Sex and Personality: Studies in Masculinity and Femininity*, New York and London, McGraw-Hill Book Company, 1936.

10. Rowe, A. W.: *Studies of Endocrine Glands: Differential Diagnosis of Endocrine Disorders*, *Endocrinology* 13: 327-362 (July-Aug.) 1929.

11. Carmichael, H. T., and Kenyon, A. T.: *Eunuchoidism: A Psychiatric and Endocrine Study of Six Cases*, *Arch. Neurol. & Psychiat.* 40: 717-742 (Oct.) 1938.

12. Löwenthal, Karl: *Der Eunuchoidismus des Mannes*, *Beitr. z. path. Anat. u. z. allg. Path.* 86: 426-439, 1931.

13. Wagenseil, Ferdinand: *Beiträge zur Kenntnis der Kastrationsfolgen und des Eunuchoidismus beim Mann*, *Ztschr. f. Morphol. u. Anthropol.* 26: 264-304, 1927.

directing the patient's mental readjustment to castration, and it is suggested that when possible such psychotherapy should be instituted preoperatively.

SUMMARY

A 53 year old surgically castrated man retained libido and prowess for thirty years after complete orchidectomy. The patient's physical habitus suggested the feminine distribution of fat and pubic hair. No physical change was noted in the size or appearance of the penis. Tests for testosterone and androsterone gave negative results. Shortly after castration, migraine attacks began and continued, being of a type and character suggesting an unbalanced pituitary hyperfunction.

706 West 168th Street.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

METAPHEN (See New and Nonofficial Remedies, 1939, page 328).

The following dosage form has been accepted:

Medipax Brand of Vaginal Tampon-Suppositories with Metaphen 1:2,000: A product devised to enable prolonged medication to the upper vaginal vault and cervical region by incorporating a metaphen medicated suppository together with a tampon on a single applicator.

Actions and Uses.—The suppository contains 2.25 mg. (0.0375 grain) of metaphen in 4.5 Gm. (75 grains) of glycerogelatin shaped for insertion. After insertion into the vagina the suppository melts at body temperature. The tampon which is contained in the applicator and is composed of surgical cotton $1\frac{1}{2}$ inches wide by $2\frac{3}{4}$ inches long is released by appropriate pressure on the sleeve of the applicator. The tampon swells by taking up moisture, thus holding the medication in contact with the desired parts. A cord is attached to the tampon for convenient removal.

Prepared by Allen Laboratories, Inc., New Brunswick, N. J.

MERTHIOLATE (See New and Nonofficial Remedies, 1939, p. 326).

The following dosage form has been accepted:

Medipax Brand of Vaginal Tampon-Suppositories with Merthiolate 1:2,000: A product devised to enable prolonged medication to the upper vaginal vault and cervical region by incorporating a merthiolate medicated suppository together with a tampon on a single applicator.

Actions and Uses.—The suppository contains 2.25 mg. (0.0375 grain) of merthiolate in 4.5 Gm. (75 grains) of glycerogelatin shaped for insertion. After insertion into the vagina the suppository melts at body temperature. The tampon, which is contained in the applicator and is composed of surgical cotton $1\frac{1}{2}$ inches wide by $2\frac{3}{4}$ inches long, is released by appropriate pressure on the sleeve of the applicator. The tampon swells by taking up moisture, thus holding the medication in contact with the desired parts. A cord is attached to the tampon for convenient removal.

Prepared by Allen Laboratories, Inc., New Brunswick, N. J.

BISMUTH SUBSALICYLATE (See New and Nonofficial Remedies, 1939, p. 141).

The following dosage form has been accepted:

Ampuls Bismuth Subsalsicylate in Oil 0.13 Gm. (2 grains), 1 cc.: Each cubic centimeter contains bismuth subsalsicylate-U. S. P. 0.13 Gm. (2 grains) in sterile olive oil suspension containing 3 per cent chlorobutanol (chloroform derivative).

Prepared by the William S. Merrell Company, Cincinnati, Ohio. No U. S. patent or trademark.

LUMINAL SODIUM (See New and Nonofficial Remedies, 1939, p. 126).

The following dosage form has been accepted:

Luminal-Sodium Tablets, 1 grain.

MERCURIC SALICYLATE (See New and Nonofficial Remedies, 1939, p. 319).

The following dosage forms have been accepted:

Ampuls Mercury Salicylate in Oil 0.065 Gm. (1 grain), 1 cc.: Each cubic centimeter contains mercuric salicylate-U. S. P. 0.065 Gm. (1 grain) in sterile olive oil suspension containing 0.5 per cent quinine and urea hydrochloride-U. S. P.

Prepared by the William S. Merrell Company, Cincinnati, Ohio. No U. S. patent or trademark.

Ampuls Mercury Salicylate in Oil 0.1 Gm. (1½ grains), 1 cc.: Each cubic centimeter contains mercuric salicylate-U. S. P. 0.1 Gm. (1½ grains) in sterile olive oil suspension containing 0.5 per cent quinine and urea hydrochloride-U. S. P.

Prepared by the William S. Merrell Company, Cincinnati, Ohio. No U. S. patent or trademark.

Council on Foods

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT BY DR. COWGILL OF ONE OF THE TOPICS DISCUSSED WHEN CONSIDERATION WAS BEING GIVEN TO THE QUESTION OF THE DESIRABILITY OF ADDING VITAMIN B₁ TO FOODS. PARTLY ON THE BASIS OF THIS REPORT, THE COUNCIL HAS ADOPTED CERTAIN POLICIES WHICH HAVE BEEN REPORTED IN THE JOURNAL FOR AUG. 19, 1939.

FRANKLIN C. BING, Secretary.

THE NEED FOR THE ADDITION OF VITAMIN B₁ TO STAPLE AMERICAN FOODS

GEORGE R. COWGILL, PH.D.

NEW HAVEN, CONN.

The recent isolation and synthesis of vitamin B₁ (thiamin)¹ has placed in the hands of clinicians and students of nutrition alike a most valuable therapeutic agent as well as dietary essential in pure form. Clinical trial of this substance in the United States over a comparatively short period has already yielded results so striking as to warrant consideration of the question of the adequacy of American diets with respect to vitamin B₁. It has been generally recognized that the diets in common use in the Orient and certain other parts of the world where beriberi is endemic are seriously deficient in this factor, but until comparatively recently it has been questioned whether this is true also for the United States and European countries. The recent and remarkable successes attending the use of pure vitamin B₁, often in conditions in which lack of this factor seemed quite unlikely, can be interpreted only as meaning that vitamin B₁ deficiency must be much more widespread in this country than clinicians have believed hitherto. Strauss,² who has reviewed this recent therapeutic use of vitamin B₁, definitely states that "vitamin B₁ deficiency is probably more commonly found in the United States than has been supposed. The observations of Spies and his colleagues,³ who have been studying pellagra, are particularly interesting in this connection. In many of their cases in which nicotinic acid has been provided but the patients allowed to continue on their customary diets the symptoms of pellagra have been relieved but those of beriberi have eventually appeared, thus demonstrating the presence of a B₁ deficiency masked by a more serious shortage of nicotinic acid. Jolliffe⁴ has recently published a clinical evaluation of the adequacy of vitamin B₁ in the American diet. He concludes that the margin of safety against beriberi afforded by American diets "varies from 20 to 80 per cent," depending on the method used in making the evaluation. "A large fraction of our population, particularly those spending per capita less than two dollars per week for food, subsist on diets of borderline adequacy in vitamin B₁." Jolliffe also expresses the opinion that, "while vitamin B₁ deficiency is endemic in the United States, this disease, called beriberi in the Orient, is usually classified here under one of a variety of misleading diagnoses such as 'alcoholic,' 'gestational,' 'diabetic,' 'metabolic,' or 'gastrogenous' polyneuritis" (p. 65).

From the Laboratory of Physiological Chemistry, Yale University.
1. Williams, R. R.: The Chemistry of Thiamin (Vitamin B₁), J. A. M. A. **110**: 727-732 (March 5) 1938.
2. Strauss, M. B.: The Therapeutic Use of Vitamin B₁ in Polyneuritis and Cardiovascular Conditions, J. A. M. A. **110**: 953 (March 26) 1938.
3. Spies, T. D., and Airing, C. D.: The Effect of Vitamin B₁ on the Peripheral Neuritis of Pellagra, J. A. M. A. **110**: 1081-1084 (April 2) 1938. Also personal communication to the author from Dr. Spies.
4. Jolliffe, Norman: A Clinical Evaluation of the Adequacy of Vitamin B₁ in the American Diet, Internat. Clin. **4**: 46-66 (Dec.) 1937.

To students of the physiology of vitamin B₁,⁵ these recent developments are by no means unexpected. The relation of minimum daily requirement to effective curative dose in animals, considered along with such estimations of the probable human requirement as it was possible to make in the absence of trials with the pure vitamin, suggested that with the concentrates available at the time it would be very difficult to demonstrate in any dramatic fashion the value of this vitamin in the treatment and prevention of the less striking features of the beriberi picture. Conservative interpretation of such clinical observations as were made with vitamin concentrates was doubtless to be expected.

The recent changing view of clinicians regarding the serious probability of vitamin B₁ deficiency in this country raises some interesting questions for all students of nutrition and public health. The solution of these questions is of great importance in relation to the general health and welfare of our people.

Let us first consider how much vitamin B₁ human beings should receive. From the data presented in a recent review of the literature bearing on this question⁶ it appears that adults require daily as a minimum approximately 300 to 350 international units (I. U.) of the vitamin, which is equivalent to about 1 mg. of the pure thiamin.⁷ This minimum is equal to about 10 international units per hundred calories daily. Preschool children apparently need as much as 20 to 25 or more international units per hundred calories daily. It is pertinent to consider to what extent these requirements are being met under the dietary conditions prevailing in the United States. If they are being met, what appears to be the factor of safety above these minima afforded by our American diets?

FOOD STATISTICS

In attempting to answer these questions, statistics of food consumption for the nation as a whole may be examined, particular attention being paid to those foods which are low in vitamin B₁ but used in relatively large amounts. The two most important foodstuffs in this connection are the cereals, with their refined products, and sugar.

Cereals constitute the principal source of energy in the world's diet, but the predominance of particular cereals over others in any given part of the world appears to be the resultant of a variety of factors, notably ease of cultivation, cost, purchasing power of the population, custom and taste. As is well known, rice is the staple cereal in the Far East, whereas wheat occupies the dominant position in the United States and Europe. For the years just before the Great War, it appears that the people of the United States secured about 34 per cent of their total calories from cereals; 26 per cent were derived from wheat, which constituted about 75 per cent of the total cereals used.⁸

In table 1 are presented data for consumption of wheat in the United States during certain periods.

From the review of data on world use of cereals prepared by the Mixed Committee of the League of Nations⁹ (see table 1) it is evident that there has

been a steady decline in the food use of bread cereals for a period of years, and this decline appears

to have been greatest in the countries where the great bulk of the cereal consumption consists of wheat. These are, in general, the countries with the highest levels of living; as income rose, there was a partial substitution of more expensive non-cereal foods for wheat. In countries where rye or maize was the principal cereal, there has, on the other hand, been a tendency towards their displacement by wheat [p. 102].

For a person with an average daily energy exchange of 3,000 calories, the wheat consumption for 1929-1934 (table 1) would mean approximately 32 per cent of the calories derived from this cereal. Assuming that the decline in consumption of cereals in the United States has continued to the present year, it does not seem unreasonable to conclude that our population, by and large, secures probably as much as 25 per cent of its calories from wheat and its many products.

Let us consider what this means with respect to intake of vitamin B₁. The roller mill for manufacture of wheat flour was invented by Helfenberger about 1830. The first American rolls to be constructed were installed in Connecticut about 1874. Prior to Helfenberger's

TABLE 1.—Consumption of Wheat and Cane Sugar

Food	Period	Consumption		Yielding About	
		Per Capita		Calo- ries per Day	Per Cent of 3,000 Calories Daily
		Per Year,	Per Day,		
Wheat (Wheat Studies of the Food Research Institute, Stanford Uni- versity, Calif. 11, No. 7, 12, No. 10, 1935)	1894-1899	145.6	399		
	1909-1914	140.2	384		
	1929-1934	100.2	274		
	1821	8.6	9.9	89	1.8
	1850	13.6	37.3	149	5.0
Cane sugar (1821, 1850, 1900 and 1928 Nutrition, ⁹ p. 108, 1931, Mendel, L. B.: J. A. M. A. 99: 117 [July 9] 1932)	1900	30.2	83.8	385	11.2
	1928	47.0	128.8	515	17.2
	1931	49.0	134.2	537	17.9

invention wheat flour was obtained by grinding between stones. According to Baker, Wright and Drummond¹⁰ such a flour represented 81.4 per cent of the original wheat kernel and contained on an average 1.65 international units of vitamin B₁ per gram and about 62 per cent of the total vitamin present in the wheat. In contrast to this, modern wheat flour represents only 72.5 per cent of the kernel and has as low as 0.15 international unit of vitamin B₁ per gram and only about 5.5 per cent of the vitamin originally contained in the cereal. In other words, the modern milling process gives us a product with a vitamin B₁ content about one eleventh of that of the old stone-ground flour. Such a change would not be of much practical importance if the products in question formed only a relatively small part of the dietary. When, however, they furnish as much as 25 or more per cent of the total calories consumed, this tremendous decrease in vitamin B₁ content becomes serious indeed.

Another well known component of the American dietary important in this connection is sugar. Table 1 presents data indicative of the consumption of this food in the United States over a period of years.

In contrast to the decreasing use of cereals there has been a steady rise in the consumption of the highly purified foodstuff cane sugar. No doubt this has been due in considerable measure to the great developments

5. Cowgill, G. R.: The Physiology of Vitamin B₁, J. A. M. A. 110: 805-812 (March 12) 1938.
6. Cowgill, G. R.: Human Requirements for Vitamin B₁, J. A. M. A. 111: 1009-1016 (Sept. 10) 1938.
7. The latest (1938) definition of the international unit specifies that it be equal to 3 micrograms of the pure vitamin. This means that 333 international units is contained in 1 mg. of crystalline thiamin chloride.
8. Wheat Studies of the Food Research Institute 5, No. 4: The Place of Wheat in the Diet, Stanford University, Calif., 1929.
9. Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy, Geneva, 1937. See p. 102 et seq.
10. Baker, A. Z.; Wright, M. D., and Drummond, J. C.: The Nutritive Value of Bread, J. Soc. Chem. Ind. 56: 191-194 (Trans.) 1937.

in the sugar industry making the available supply greater than ever before, but the sweet taste of this product has also played a great role. That sugar is valuable as a source of energy cannot be questioned, but, to the extent that it displaces other foods which may at the same time function as carriers of important nutrients such as minerals and vitamins, this increasing use of sugar is obviously not in the public interest.

The statistical data presented in table 1 indicate that the American people secure something like 42 or more per cent of their calories from these two foodstuffs relatively poor in vitamin B₁ or free of it. The decreasing use of wheat, which is a fact to be considered, cannot be regarded as playing a significant helpful role in this connection, because it is more than offset by the increasing use of sugar. In the decades immediately after the introduction of modern milling processes there was still an appreciable demand for less highly refined wheat products. However, the more refined white flour has steadily gained in popularity because of its many advantages, notably its stability in commerce as contrasted with whole wheat flour, for example, and its whiteness with consequent appeal to the eye, suggestion of greater purity. This last named advantage (?) is similar to that possessed by polished rice, which has proved to be the favored cereal in the Far East in spite of numerous governmental efforts to secure widespread substitution of undermilled rice for it in the attempt to combat beriberi.

The foregoing summary of statistics on wheat and sugar suggests that these foods supply daily at least 42 per cent of the total calories. It will be noticed that I have taken 3,000 calories a day as the base of reference. If smaller figures, 2,700 or 2,500, for example, are used, the percentages become 55 and 60, respectively. If Swanson's treatise on "Wheat and Flour Quality"¹¹ is taken as the authority, the total calories obtained daily per capita from wheat and cane sugar represent about 1,375 calories. This constitutes 45 per cent of a 3,000 calorie total, and 51 and 55 per cent when the daily totals are 2,700 and 2,500 calories, respectively.

In commenting on the significance of these changes in food habits and the effects of milling on the wheat, Jolliffe aptly writes: "It seems, therefore, that a 55 per cent fraction of the calories in the American diet of 1840 containing a minimum of 600 I. U. of vitamin B₁ has been replaced in the contemporaneous American diet by a like fraction containing only about 50 I. U." (p. 52).

Students of nutrition now emphasize a greater use of the so-called "protective foods," which are primarily milk, green vegetables and fruits. These foods are excellent sources of calcium (milk and green vegetables) and vitamin C; however, they do not rate high in vitamin B₁ content. If the American people continue to use wheat and sugar in amounts currently consumed, simple calculation reveals that, in order to secure the 550 international units of vitamin B₁ which has been lost during the past century as a result of refinement in milling of wheat, one would be forced to consume tremendous and impossible quantities of these particular "protective foods." Taking the distribution of foods characteristic of the average American diet described by Sherman¹² as a basis of estimation, Jolliffe⁴ finds that one would have to consume daily a combination of 625

Gm. of fruit, 600 Gm. of potatoes, 880 Gm. of other vegetables and 1,260 cc. of milk. This combination is, of course, impossible because of its bulk. It might be supposed that there are many other foods which could be used to advantage here, but careful study of this point indicates that these "other foods" are rather limited. Thus, an examination of the lists given on pages 236-240 in tables X-XVI of the monograph by Williams and Spies¹³ indicates that only ten foods contain more than 3 micrograms of thiamin per gram of the food. In order to appreciate the significance of these figures, the reader should remember that whole wheat contains on an average about 4.6 micrograms per gram. A more liberal use of other seeds besides those of the cereal plants, notably nuts, and the members of the legume family, such as beans and peas, would constitute a partial solution of the problem. However, these foods are all of them quite concentrated with respect to energy and therefore can be used in this way only to the extent that they replace cereals and sugar. On the other hand, fruits, vegetables and milk, because of their high moisture content, must be ingested in considerable quantity in order to serve as noteworthy sources of calories. Another point is worthy of mention in this connection. Many of the foods that might be considered suffer some loss of the vitamin through poorer methods of preparation in the home, such as, for example, those which involve leaching out into the water used in cooking and then rejection of that water. The operation of this factor cannot be stated quantitatively, but obviously any consideration of it means that the public's intake of the vitamin may be even lower than the foregoing rough estimates.

The discussion thus far has been limited almost entirely to wheat and sugar, and it has been shown that no very satisfactory solution of the problem can be expected by efforts directed toward greater use of the "protective foods" other than whole grains or the germ. It seems unnecessary to belabor the point that, so far as food statistics indicate, the American dietary is not rich in vitamin B₁, as many people have supposed, but too close to the minimum in this respect to be viewed with equanimity.

AMERICAN DIETARIES

Statistical studies of food consumption such as have been discussed constitute only a first approximation answer to the question What do the people eat? More precise information must come from examination of food intake records. Fortunately, data of this sort are available for examination. Stiebeling and Phipard¹⁴ have made extensive analyses of the content, cost and nutritive adequacy of diets of employed wage earners and low salaried clerical workers in four sections of the United States, namely North Atlantic states, Pacific, East South Central and the South:

The study was based on about 4,000 records of a week's food consumption, placed at the disposal of the Bureau of Home Economics through the courtesy of the Cost of Living Division of the United States Bureau of Labor Statistics. The records were collected in 1934-37 as part of a study of income and disbursements for family living.

In their discussion of vitamin B₁, Stiebeling and Phipard state (p. 61):

The average vitamin B₁ content of the diets of these families shows a gradual increase with rising weekly expenditures for food. Expenditures of \$0.63-\$1.24 a person a week brought:

13. Williams, R. R., and Spies, T. D.: Vitamin B₁. New York: Macmillan Company, 1938.

14. Stiebeling, Hazel K., and Phipard, Esther F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities, Circular 117, U. S. Dept. Agric., January 1939.

11. Swanson, C. O.: Wheat and Flour Quality, Minneapolis, Burgess Publishing Company, 1937.

12. Sherman, H. C.: The Chemistry of Food and Nutrition, ed. 4, New York, Macmillan Company, 1932.

diets containing from 280 to 330 international units of vitamin B₁ a requirement unit a day, respectively, in the case of white and Negro families in Southern cities. Less than a tenth of the white families of these cities, but about one third of the Negro families, were spending these amounts for food. The average vitamin B₁ content of their diets was scarcely two thirds of the fairly liberal suggested allowance.

The general reader may desire some comment on the meaning of the term "requirement unit." When dealing with families and other groups instead of individuals, it is obviously desirable both to take account of the requirements of the various individuals in the family and to deal with the family as a unit. The "requirement unit" represents an attempt to deal with this situation. Thus, Stiebeling and Phipard defined their unit as the need of an adult 20 years and over in age, and this requirement was set at 500 international units of B₁ or 1.5 mg. of pure thiamin, and given a value of 1.0 on a requirement scale. For boys 16 to 19 years of age the corresponding figures taken are 600 international units and 1.8 mg., respectively, or a factor of 1.2 on the "requirement scale." For children of other ages the respective figures range downward to those for children under 4 years of age, namely 200 international units, and 0.6 mg., and a factor on the requirement scale of only 0.4. A family consisting of both parents, a 16 year old boy and a 3 year old child would then require 2 plus 1.2 plus 0.4 or a total of 3.6 times the unit requirement, which would be equal to 1,800 units. This could also be expressed as 1,800 units divided by 3.6 requirement units to give "500 units a requirement unit." On this latter basis families can be compared, with the needs of the individual members also given their due consideration.

Another quotation much to the point is the following (p. 63):

Of the entire number of white families participating in this survey, it is estimated that the 25 per cent choosing diets lowest in vitamin B₁ obtained less than 400 international units a requirement unit daily and 75 per cent, 600 or less international units a requirement unit a day. About 10 per cent selected foods furnishing less than 300 international units a requirement unit a day, and about half of the families obtained 500 or more international units of vitamin B₁ a requirement unit a day. . . .

There is probably little danger of serious vitamin B₁ deficiencies if individuals *regularly select*¹⁵ a goodly share of their needed calories from foods that have not been artificially refined or depleted of their vitamin B₁ by the processes of preparation. The relatively high vitamin B₁ value of diets of Southern Negro families, even when weekly food expenditures were low, was due to the fact that they consumed large quantities of whole corn meal, sweet potatoes and pork.

The words I have italicized should be emphasized in this connection because they really mean here that the factor of safety against vitamin B₁ shortage is not large: that these families in question must pay special attention to the matter of proper choice of foods if they are to obtain sufficient quantities of the vitamin. When particular attention must be paid to this matter, success will be determined in considerable measure by the knowledge of vitamin B₁ distribution in foods and the like which the families possess. Although we may pride ourselves on the high literacy rate characteristic of the American people by and large, we cannot but feel most dissatisfied with respect to the possession of detailed knowledge of food values on the part of the great mass of our population.

15. Italics are mine.

Jolliffe⁴ has evaluated these Stiebeling-Phipard dietaries for vitamin B₁ content in two ways and estimated their respective factors of safety against vitamin deficiency. Using my vitamin/calory ratio as the criterion, the average of his calculations of the factor of safety afforded by these particular dietaries proves to be 14.4 per cent, with three of the eighteen groups yielding negative instead of positive values. When the Williams-Spies¹³ thiamin/non-fat calories ratio is used as the basis of judgment, the average proves to be 18.3 per cent, with one group giving a negative value. It is unnecessary to discuss here the relative merits of the two modes of calculation employed, especially when they yield results so nearly the same. Let it suffice to call attention to the fact that these averages are not much above the average variations encountered in numerous biologic phenomena, such as, for example, basal metabolic rate. If, then, these American dietaries, the best averaged in with the poorer ones, afford a factor of safety against vitamin B₁ deficiency only moderately above what is estimated to be the requirement of normal healthy people, and the effects of diarrhea¹⁶ and other fairly common conditions in increasing the amount of vitamin needed are also taken into account, one cannot fail to be impressed with the importance of considering measures for increasing the vitamin B₁ content of American foods. Additional evidence may be reported in support of the idea that many of our American dietaries are not optimal in content of vitamin B₁. Thus, Morgan and Barry¹⁷ were able to show that the addition of B₁ rich materials to the diet of school children was associated with a definite increase in the growth rate; Summerfeldt,¹⁸ and Ross and Summerfeldt¹⁹ have also reported that the addition of vitamin B₁ containing materials to presumably adequate dietaries for children resulted in more rapid growth and improved nutritional status.

In all probability the present shortcomings of American dietaries with respect to vitamin B₁ content have not developed suddenly but are the result of a gradual change proceeding over a period of years. The food statistics that have been reviewed indicate that the per capita consumption of sugar has grown steadily for a century and has remained fairly uniform at a high level for only a few years. Such an increase has undoubtedly operated gradually to diminish the vitamin B₁ of our dietaries. The effect of the developments in wheat milling has been most pronounced since about 1870, with the highly refined wheat flour steadily gaining in use and popularity. I have not been able as yet to secure suitable American data on which to base calculations expressing more precisely this downward trend in B₁ content of dietaries in the United States. However, the conditions in this country have probably been fairly similar to those in England, particularly as affected by the growth of the sugar industry and the changes in the milling of cereals, the two dominant factors under consideration. Baker, Wright and Drummond²⁰ have made estimations of the probable B₁ content of various English diets used as far back as 1615. Table 2 is taken from their paper.

16. Dann, Margaret, and Cowgill, G. R.: Influence of Diarrhea on the Vitamin B₁ Requirement, *Arch. Int. Med.* 62: 137-150 (July) 1938. Cowgill.⁴

17. Morgan, Agnes F., and Barry, Margaret M.: Underweight Children: Increased Growth Secured Through the Use of Wheat Germ, *Am. J. Dis. Child.* 39: 935-947 (May) 1930.

18. Summerfeldt, Pearl: The Value of An Increased Supply of Vitamin B₁ and Iron in the Diet of Children, *Am. J. Dis. Child.* 43: 284-290 (Feb.) 1932.

19. Ross, J. R., and Summerfeldt, Pearl: Value of An Increased Supply of Vitamin B₁ and Iron in the Diet of Children: II, *Am. J. Dis. Child.* 49: 1183-1188 (May) 1935.

It will be noticed that about a hundred years ago (1838) there was some variation with respect to dietaries used in feeding the poor. The Poor Law applicable to the city of London provided a better diet as regards vitamin B₁ than that in force in Dudley Union. The most striking fact of interest in this connection is the observation that the paupers fed under the Poor Law of London in 1838 received approximately twice as much vitamin B₁ as the two highest income groups of London studied in 1937. It is difficult to escape the conclusion that the trend of vitamin B₁ supply over the past century has been definitely downward. If this condition is not now recognized and then made the basis of appropriate action, we may confidently expect to see our population as a whole in the same category as the masses of the Far East, where polished rice is the favored staple used in too great amounts with the consequence of a high average incidence of manifest beriberi. As was pointed out earlier in this paper, many clinicians have already convinced themselves that a dangerous situation in this respect has been reached.

PRACTICAL MEASURES

If the thesis is accepted that current American dietaries are not satisfactory in content of vitamin B₁, the question arises as to what practical measures might

TABLE 2.—Probable B₁ Content of Various English Diets

Date	Diet	Vitamin B ₁ Yielded per Day, I. U.
1615	Suggested diet for seamen.....	640
1670	Soldiers' ration	1,000
1686	Patients in Barts.....	300-700
1782	Parish poor	600-850
1830	Diet of John Dalton.....	1,230
1836	Prisoners, Ipswich prison.....	700
1838	Poor Law, city of London.....	1,060
1838	Poor Law, Dudley Union.....	600
1937	London dietaries: two highest income groups*..	450-550

* Cited by Baker, Wright and Drummond¹⁰ as "Lloyd's data."

be taken to improve them in this respect. It seems unquestioned that we should continue to employ the educational process in every possible way in an effort to disseminate knowledge of food values in the widest possible manner. However, it has already been pointed out that emphasis on greater use of the "protective foods" cannot solve the problem of increased B₁ supply. In this connection the emphasis will have to be placed on greater use of legumes and nuts, but this line of action can be effective only within rather narrow limits because of the high energy value of these foods.

As a free people must necessarily exercise choices when securing their foods, one basic objective of all efforts directed toward improvement of our dietaries should be to see that, with the various foods readily available, it is exceedingly difficult for any one over a reasonable period, whether he knows a great deal about the science of nutrition or not, to make a set of food selections that is seriously in error. Putting the matter the other way, we should aim at making the conditions of food supply such as to yield with the greatest of ease diets that are excellent in every respect.

What lines of action are possible when attempting to deal constructively with this problem? In the educational work emphasis could be laid on greater use of the "undermilled" cereal products, under which heading shall be included whole-meal flour and other fractions, such as middlings. In view of the experience of governmental and health authorities in the Far East dealing with the problem of too great use of polished rice to the exclusion of the undermilled varieties, this

plan of attack would probably be of only limited usefulness. No doubt a certain small fraction of the population will respond to educational efforts emphasizing the high B₁ value of the undermilled cereals, and to this extent such efforts will yield satisfactory returns. The greater part of the population will still find the white highly milled flour possessing the greatest appeal, if past experience is any indication. The development of modern transportation facilities, the necessity of marketing cereals in forms that are stable for long periods and other factors peculiar to our modern complex civilization will, in my opinion, continue to give to white flour a position of prominence in our dietaries sufficiently great to mean essentially a continuance of our basic problem.

The isolation and availability through chemical synthesis of pure vitamin B₁ offers another line of attack. It is possible to add the vitamin to wheat flour in any desired and appropriate amount. Whether this is economically feasible at the present time, I leave to others to decide. No doubt also there are certain technical industrial questions involved here, but it is reasonable to believe that these are amenable to solution by research directed specifically toward that end.

In suggesting that vitamin B₁ be added to cereals, particularly wheat flour, it is pertinent to point out that flour functions essentially as a basic staple food entering into the baking of numerous special products. It is used in the manufacture not only of bread but of cakes, crackers, cookies and the like. There are, of course, many kinds of wheat flour, some suitable for making bread, others more useful for cakes, crackers, cookies and the like. For the purposes of the present discussion the word "flour" may be understood to mean all these highly milled products of the wheat berry regarded as a basic staple class of products. If this basic staple could be made a carrier of vitamin B₁, the entire pastry group of foods would no longer stand out in any dietary as essentially devoid of vitamin B₁, as is now the case. It seems reasonable to believe that through the one act of adding the vitamin to the wheat flours as a group we would increase directly the vitamin B₁ intake of a greater part of our population than could be affected by any other single step. The alternative is to encourage each of the many units of the entire baking industry to add the vitamin to its particular products. It is probably too much to expect any large measure of success in such a campaign.

How much vitamin B₁ should be added to wheat flour and other foods worthy of consideration in this connection? One cannot, of course, be dogmatic in answering this question. However, the following ideas are believed to be worthy of consideration:

Vitamin B₁ is now believed to play a role in energy metabolism, probably in the metabolic transformation of carbohydrate in the body.²⁰ It seems logical, therefore, to consider that any addition of it to a food should be made in some relation to the energy value of that food. This gives a principle applicable to a variety of foods. Another principle applicable to a refined product, wheat flour, for example, is that the vitamin be added in amounts sufficient to make its concentration approximate that present in the original unprocessed food; in the case of wheat flour this would mean adding enough vitamin B₁ to make the flour approximately equal in vitamin content to the original wheat kernel. This might be called the principle of "restoration" to be distinguished from that of "fortification," by which

is meant the addition of vitamin in such amounts as to make the concentration even greater than that of the original natural product or what the most liberal estimate of the human need for substance would indicate to be desirable.

In this connection the problem of addition of vitamin B₁ to purely artificial food mixtures designed to be more or less perfect in a nutritive sense is worthy of mention. It seems obvious that the principle of restoration can hardly apply to such situations, whereas that of securing a desirable value for the vitamin/calory or thiamin/carbohydrate-calory ratio in the final product seems peculiarly appropriate.

Elsewhere⁶ it has been pointed out that the need of adults seems to be not less than about 10 international units of the vitamin per hundred calories; children apparently require amounts ranging from 20 to 25 international units per hundred calories. The wisdom of adding the vitamin to foods in such amounts as to give at least 25 international units per hundred calories would seem to be unquestioned, because this would be bringing the product up to the irreducible minimum for a child and making it a little better than that needed by an adult. The desirability of a higher standard than this is therefore obvious. If the "restoration" of wheat flour and related grain products is taken as our guiding principle, flour would contain approximately twice the minimum for children that has been mentioned. Another point of view, valuable in this connection, relates the amount of vitamin in the "restored" product to the quantity obtained daily when customary amounts of the product are eaten. The effect of a substitution in present dietaries of "restored" flours should be essentially a "restoration" of our present dietaries to those in common use a century ago and discussed earlier in this paper. In quantitative terms this would mean that our average daily diet would contain from about 1,000 to 1,200 international units of the vitamin instead of the present 450 to 550 units.

The question might well be asked: Should wheat flour and related foods ever be given more vitamin B₁ than sufficient to "restore" them to the native cereal from which they were obtained, and if so, what limitation to such "fortification" would be reasonable? In attempting to answer this question one might draw on the scientific literature dealing with the problem of relative requirements for special situations, lactation for example, in contrast to that for mere maintenance of the adult or for normal growth of the young. Studies of lactation in the rat⁶ indicate that, in order to nurse a litter successfully to weaning, the mother rat requires from three to five times as much vitamin B₁ as she requires for her own maintenance metabolism. Mention has already been made of studies indicating that growing children show optimal retention of B₁ when receiving about 25 international units per hundred calories. This may be compared with an estimate of about 10 international units per hundred calories needed by the adult. Here the factor proves to be 2½. Evidently a factor of safety of at least 3 could be regarded as having some scientific justification. From this point of view one is led to the suggestion that the addition to a food product intended for general use of thiamin in such amount as to give 75 international units per hundred calories could be regarded as reasonable, although this concentration would in fact exceed somewhat that characteristic of the whole grains. Perhaps the simplest solution of the question would be to take the highest natural concentration in the class of whole-grain foods as the standard of maximum to apply when

the vitamin is being added to a *general purpose* food. Greater concentrations, representing true "fortifications," could then characterize *special purpose* foods, and in such cases the amount of vitamin to be added could be determined by the particular purpose aimed at in the preparation of the product, and other pertinent considerations.

This principle of securing a desirable vitamin/calory ratio is, after all, not anything really new. Students of nutrition have long related the minimal needs for other factors to the energy yielded by the diet. For example, the requirement of calcium is often stated as being not less than 23 mg. per hundred calories, that for phosphorus at least 44 mg. per hundred calories, that of iron about 0.5 mg. per hundred calories and so on.

As living organisms tend to regulate their food intake to meet their energy needs, probably because the requirement for this factor is so dominant in most situations, it is logical to relate the demands of non-energy yielding nutrients to the caloric need. What may be new in the suggestion made here is the application of this principle to individual foods instead of the dietary as a whole or the person consuming the food. Such a use of this principle appears warranted, particularly when foods are to be manipulated, so to speak, to be modified by addition of special desirable factors, and this is essentially the situation presented by the problem under consideration. The application of this principle, particularly with respect to vitamin B₁, to wheat and other grains and their products now constituting such a large part of the American dietaries would, in my opinion, be definitely in the interest of public health and welfare.

Students of the vitamins are aware that these important dietary factors are now exploited vigorously in the pharmaceutical trade. It is my opinion that the American people should, if possible, obtain their needed vitamins from foods rather than from pharmaceutical preparations. The preparations available in the local drug store should be those desired by the physician in the treatment of special cases which involve vitamin deficiencies. It is certainly not the ideal solution of our basic problem of improving the general nutrition of the American people to advocate that they make greater use of the various vitamin B₁ preparations now available essentially as pharmaceuticals, because the people most in need of the vitamin happen to be those with the least money to spend for necessities. We are thus brought around to the need for improving our important widely available and widely accepted foods. If certain basic energy-rich staples are made the appropriate carriers of the needed vitamins, as was pointed out previously, this single step affects more persons in the desired way than any other that can be devised.

SUMMARY

There are grounds for believing that American dietaries as a whole are unsatisfactory with respect to the content of vitamin B₁. The examination of available food statistics as well as of recently collected American dietaries, the observations of clinicians concerning the high therapeutic value of vitamin B₁ in conditions hitherto not suspected to be due to lack of this factor, and the observations of the value of added vitamin B₁ to the dietaries of many children all support this belief. It is believed that prosecution of a program fostering addition of vitamin B₁ to staple American foods according to the principles discussed in the present report would be definitely in the interests of the public.

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SATURDAY, DECEMBER 9, 1939

The Platform of the American Medical Association

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

SPONTANEOUS PANCREATIC HYPOGLYCEMIA

In THE JOURNAL, ten years ago, appeared a report by Howland, Campbell, Maltby and Robinson,¹ of Toronto, describing a case of dysinsulinism of six years' duration in which there were attacks of coma and convulsions. These attacks were found to be caused by low blood sugar levels and could be warded off by the administration of food. The case was diagnosed as an islet cell tumor of the pancreas; Roscoe R. Graham found and removed a tumor which the authors considered to be a slow growing carcinoma of the islands of Langerhans and from which insulin could be recovered. The patient made a complete recovery. A more recent report by Campbell, Graham and Robinson,² of the same clinic, states that the patient has now been well and free from any disability related to the uncontrolled overproduction of insulin for more than ten years.

The protean manifestations of the hypoglycemia complex have been exhaustively treated by Harris, Whipple, Wauchope and Sigwald. However, unless one becomes, as Harris puts it, "hyperinsulinism conscious," diagnostic errors may yield diagnoses ranging all the way from neurasthenia to epilepsy and brain tumor.

Banting and his associates recognized the dangers which may arise from reducing the blood sugar too far below the normal level. The most commonly observed manifestations of insulin shock are nervousness, trembling, weakness, faintness, hunger which may be agonizing, vertigo, diplopia, mental confusion resembling alcoholic intoxication, excitement, amnesia, dysarthria, sensory and motor aphasia, delirium, coma and convulsions. Harris³ in 1924 conceived of hyperinsulinism or dysinsulinism as a clinical entity and described cases of low blood sugar in which the symptoms were improved by feeding. Hyperinsulinism or hypoglycemia appeared to be the antithesis of hypo-insulinism of diabetes.

In 1927 Wilder⁴ and his associates reported a case of hypoglycemia requiring, at the time of observation, as much as 25 Gm. of dextrose an hour to prevent convulsions. Exploratory operation by William J. Mayo revealed a large nodular pancreas with metastases to the liver. In microscopic studies the cells of this cancer bore a striking resemblance to the cells of the islands of Langerhans. Alcoholic extracts made from the cancer tissue in the liver acted like insulin on injection into rabbits. This was the first conclusive evidence of hyperinsulinism due to tumor of the islands of Langerhans.

1. Howland, Goldwin; Campbell, W. R.; Maltby, E. J., and Robinson, W. L.: Dysinsulinism: Convulsions and Coma Due to Islet Cell Tumors of the Pancreas, with Operation and Cure, J. A. M. A. 93: 674 (Nov. 31) 1929.

2. Campbell, W. R.; Graham, R. R., and Robinson, W. L.: Islet Cell Tumors of the Pancreas, Am. J. M. Sc. 198: 445 (Oct.) 1939.

3. Harris, Seale: The Diagnosis and Treatment of Hyperinsulinism, Ann. Int. Med. 10: 514 (Oct.) 1936.

4. Wilder, R. M.; Allan, F. N.; Power, M. H., and Robertson, H. F.: Carcinoma of the Islands of the Pancreas: Hyperinsulinism and Hypoglycemia, J. A. M. A. 89: 348 (July 30) 1927.

In the next decade the number of cases diagnosed and successfully treated or identified at necropsy increased to about 100; the largest single series were those of Whipple and of Womack and Leary. The cases fall into two groups: (1) those with morphologic changes in the islands of pancreas and (2) those without detectable alterations in the pancreas. The organic changes are of three types: (1) general hypertrophy and hyperplasia of the islands of Langerhans, (2) adenoma and (3) carcinoma. Carcinoma of the islands appears to be rare, not more than thirteen cases being reported in the literature. Islet adenomas, on the other hand, are common and deserve special mention. Frantz and Whipple⁵ compiled twenty-one cases of islet adenomas found at operation and ten at necropsy, to which Womack added fourteen. These unusually small tumors are situated most frequently in the tail and less frequently in the body or the head of the pancreas. The tumors are reddish and are clearly demarcated from the normal pancreatic tissue. They are usually single but may be multiple. Microscopically they consist of beta cells of varying degrees of maturity. While the concentration of insulin in these tumors was found to be from four to forty times that of normal pancreas, the total amount was not equal to that of normal pancreas. The hyperinsulinism or dysinsulinism is probably due to the fact that the production and release of insulin from the islet cells of the adenoma is not under the neurohormonal control which so delicately balances this process in a normal pancreas.

The diagnosis of pancreatic hypoglycemia is made from a careful consideration of the anamnesis and repeated determinations of fasting blood sugar and dextrose tolerance. Sooner or later the patients notice the association between attacks and hunger. The eating of sweet food is most effective in relieving the symptoms. In the differential diagnosis, hypoglycemia due to disturbances of the liver, the hypophysis or the adrenal glands must be eliminated. Dietetic treatment may prove successful in the milder cases and may be tried. Progression of the symptoms, however, justifies surgical intervention. The best results thus far have been obtained in cases of islet adenomas. Womack⁶ states that "clinical surgery offers few examples where the recovery is so complete or so dramatic as from the complete removal of an islet tumor." Resection of the greater portion of the pancreas in cases without pathologic changes has not been as successful. Among the notable exceptions is the remarkable case reported by Graham and Hartmann⁷ in which from 80 to 90 per cent of the pancreas was removed from a baby 1 year of age for chronic hypoglycemia with repeated convulsions and marked retardation in mental development. All the symptoms promptly disappeared and

have not recurred. The mental and physical states of the patient have shown marked improvement since the operation. The pancreatic tissue removed was essentially normal.

INDUSTRIAL UTILIZATION OF DAIRY PRODUCTS

Of the hundred billion pounds of milk produced annually in the United States, 46 per cent is separated to obtain cream. The skim milk which results from this operation contains vast amounts of substances which are of industrial importance and for which new uses are being sought. Skim milk, for instance, is rich in casein and lactose. Similarly, a high percentage of lactose is present in the whey obtained in the manufacture of cheese. Particularly during the last few years a considerable amount of attention has been centered on the industrial utilization of some of the by-products of the dairy industry, and a number of the achievements which have been made in this direction were discussed at a recent symposium.¹

Casein has long been used in the manufacture of various types of adhesives and may also be used to prepare plastic materials such as artificial horn or artificial ivory. A few years ago a process was discovered for converting casein into textile fiber and this new use is now attracting attention in several countries. At present Italian, Netherland and British firms are reported to be engaged in producing casein fiber, and a patent for its production has already been granted in the United States. The European production of casein fiber in 1938 was probably between six and eight million pounds. The high cost of silk induced the development of rayon and, in the same sense, the comparatively high cost of wool has given impetus to a search for cheaper substitutes. In this country there is reportedly a potential annual supply of skim milk of forty billion pounds over and above that now converted into industrial products and, according to investigators in the United States Department of Agriculture,¹ it should be possible for casein fiber to be produced much more cheaply than wool. Whether or not casein fiber will be used extensively in this country as a diluent or extender of wool remains to be seen. Stable knitted rayon is being used for this purpose at present, but casein fiber has the important advantages that it can be dyed with wool dyes and can be laundered by the same methods as wool.

Whey is obtained in large quantities as a by-product both in the manufacture of cheese from whole milk and in the manufacture of casein from skim milk. As improved transportation facilities permit the bringing of more milk to centrally located factories, not only is the farmer deprived of a valuable feed but the disposal

5. Whipple, A. O., and Frantz, Virginia K.: Adenoma of the Islet Cells with Hyperinsulinism, *Ann. Surg.* **101**: 1299 (June) 1935.

6. Womack, N. A.: Hypoglycemia Due to Adenoma of the Islets of Langerhans, *South. M. J.* **27**: 135 (Feb.) 1934.

7. Graham, E. A., and Hartmann, A. F.: Subtotal Resection of the Pancreas for Hypoglycemia, *Surg., Gynec. & Obst.* **59**: 474 (Sept.) 1934.

1. Whittier, E. O., and Gould, S. P.: *Indust. & Engin. Chem., News Edition* **17**: 369, 1939. Smith, L. T., and Claborn, H. V., *ibid.* **17**: 370, 1939. Papers presented as part of the Joint Symposium on the Industrial Utilization of Dairy Products before the Divisions of Agricultural and Food Chemistry and Biological Chemistry at the ninety-seventh meeting of the American Chemical Society, Baltimore, April 4, 1939.

of whey becomes a problem. Cheese factories converted more than a million pounds of whey into powder in 1937, and investigators in the United States Department of Agriculture have already devised a process for separating the whey powder into lactose, a protein-rich concentrate, and a solution rich in vitamin G. The lactose may be used in medicinal preparations and in infant foods as well as in the manufacture of candy. The production of lactic acid by fermentation of the lactose in whey is also a commercial activity at the present time, and the lactic acid thus produced has a wide variety of uses as an acidulant in food products such as fruit essences, extracts, syrups and baking powder. It has even been used recently in effervescent beverages in the place of citric acid. Certain esters of lactic acid may also be converted by suitable treatment into methyl acrylate, for which there is a wide variety of possible uses in the manufacture of plastic materials. It seems probable that in the near future lactic acid will play an increasingly important part in the field of solvents, in plastics, and as an acidulant for beverages and foods.

Important advances have been made in the direction of the utilization of by-products of the dairy industry. These developments are of particular interest as they involve the important nutrient milk. Moreover, some of the by-products may, in turn, be incorporated in certain foods as well as used in the manufacture of pharmaceuticals.

Current Comment

HISTAMINE IN PLATELETS OF RABBITS

From experiments originally intended to demonstrate the changes in blood histamine following vaccine administration, Zon, Ceder and Crigler¹ obtained evidence suggesting that it is the platelets which carry major portions of the blood histamine. The rabbits in the experiment were sensitized to a strain of beta-hemolytic streptococcus of low virulence. Following the intravenous administration of 10 cc. of the killed homologous vaccine to sensitized animals and also to nonsensitized controls, blood samples were withdrawn and platelets, white cells and histamine were determined. There was an almost complete disappearance of granulocytic cells following the vaccine with little change in the total histamine content. Further, there was no increase in plasma histamine, which ruled out any shift in histamine from injured white cells to plasma. It was also shown that the administration of antiplatelet serum caused a significant drop in blood histamine generally paralleling the drop in platelets. Likewise fractional centrifugation of platelet containing plasma removed histamine almost in the same proportion as the platelets. This demonstration of the distribution of histamine should be of importance in future investigations on this interesting blood constituent.

1. Zon, Leo; Ceder, E. T., and Crigler, Catherine W.: The Presence of Histamine in the Platelets of the Rabbit, *Pub. Health Rep.* 54: 1978 (Nov. 3) 1939.

"TIME" MARCHES ON!

In the issue of *Time* for December 4 appeared an article entitled "Misery Harbor," purporting to describe the recent changes in the administration of the Cook County Hospital in Chicago. The title "Misery Harbor" is taken from a series of articles which appeared in the *Chicago Daily Times* following an investigation of the hospital made by that newspaper more than a year ago. The article in *Time* is mentioned here because it is replete with absolute misstatements of fact beyond anything of a similar character published in the field of medicine even in that periodical during recent years. Indeed the article betrays a carelessness almost incomprehensible in a periodical which has in the past frequently gone to extended lengths to secure accuracy.

Briefly there follows a list of statements made by *Time* and thereafter the correct statement:

1. "During the last four years Cook County Hospital has been a battleground for two warring medical factions." There has been no battle between two warring medical factions.
2. "Last week a compromise ended the fight." There has been no compromise.
3. "Dr. Meyer never required the hospital's army of interns to attend postgraduate classes or lectures." Lectures and conferences for interns have been held for at least ten years.
4. "The American Medical Association . . . believes that all interns should taper off into actual practice with at least eighty hours of medical lectures during internship." No specific number of hours of instruction has ever been mentioned, much less required, by the Council on Medical Education and Hospitals.
5. "Consequently, four years ago, the A. M. A. dropped Cook County Hospital from its list of approved hospitals . . ." Obviously the number of lecture hours was in no wise involved.
6. "Over this point Cook County's Dr. Meyer and A. M. A.'s education secretary, Dr. Irving Samuel Cutter . . ." Dr. Irving S. Cutter is not the A. M. A.'s education secretary; he is Dean of Northwestern University School of Medicine.
7. ". . . thus automatically cutting off Dr. Meyer's supply of interns from topflight medical schools." At no time has the County Hospital failed to obtain interns from the four recognized medical schools of Chicago. No others are eligible for appointment.
8. ". . . A. M. A. last spring brought public opinion to bear." At no time has the A. M. A. made any attempt to influence public opinion concerning the County Hospital. It has studiously refrained from comment upon the situation.
9. "An A. M. A.-inspired citizens' committee . . ." The A. M. A. had nothing whatever to do with the "Citizens' Committee" which was appointed by the Board of County Commissioners upon the recommendation of a committee of hospital experts previously employed by the County Board to investigate and report upon conditions at the County Hospital.
10. Said committee ". . . hinted that the hospital might be reinstated on the A. M. A.'s list if a new director acceptable to the A. M. A. were chosen." As stated above, the Citizens' Committee had no connection whatever with the A. M. A. and therefore could not and did not claim to represent it.
11. "(2) Cook County was promised reinstatement on the A. M. A.'s list some time around Jan. 1; . . ." No such promise was given.

Immediately on the appearance of this article a telegram was sent to *Time* calling attention to some of these inaccuracies. The inaccuracies are all the more unfortunate because it would have been exceedingly simple merely by the use of the telephone, since *Time* is printed in Chicago, to secure the facts. It will be interesting to see how far *Time* goes in its correction.

ORGANIZATION SECTION

THE SIXTEENTH DECENNIAL CENSUS IN 1940

PREPARED ESPECIALLY FOR THE JOURNAL BY THE BUREAU OF THE CENSUS

There is one division of the Bureau of the Census with which every doctor in America who has ever lost a patient or attended at the birth of a new one has had contact, whether he knows it or not, and that is the Division of Vital Statistics. Eventually, through one means or another—state bureaus of public health, usually—every birth and death certificate issued in America reaches the office of the division, where, along with the millions of others of its kind, it is added to the records from which our national birth and death rates are computed, the incidence of death from certain major diseases, which the division calls "The Killers," is ascertained, the frequency of death by accident, and what type of accident, is figured and a dozen or so other enormously valuable sets of vital statistics are acquired, on the basis of which state boards, county organizations, hospitals, medical associations and individual doctors themselves can plan medical campaigns, campaigns for public health and safety, and budgets for sanitary and institutional improvements.

But the great ten year census of population, the sixteenth such, to begin April 1, 1940, will add a large amount of invaluable data to the files of the medical profession. And along with it, the biennial census of manufactures and a similar one of business, both of which begin January 2 of the coming year, include statistics of a different type which are also of real value to the doctor.

Perhaps the most interesting one of the specific questions being asked in the census schedules next year is that which is being put to the druggists of this country on the questionnaire of the business census. Druggists and pharmacists are being asked what the dollar volume of their sales was in the form of doctors' prescriptions. That figure, alongside the one giving the total sales of "drugs, medicines, chemicals, compounds," will give the physician an accurate picture of the comparative amount of money being spent for proprietaries and for prescriptive medicines. These data will be broken down into state figures and when possible into figures for large cities. A further question to be asked, of some interest to the medical profession, is on the number of registered pharmacists employed. The need for skilled chemists in the average drug store is known to all physicians, and figures on the pharmacists' profession may have a tendency to increase the quality and quantity of trained personnel in this field.

The Census of Business will tabulate all drug stores by states, counties and cities and towns of 2,500 population or more. They will be listed in two main groups—those with soda fountains and those without. Each will be asked to report on the sales of various kinds of commodities sold and to give inventory totals for the beginning and close of 1939.

The Census of Manufactures, which will be taken concurrently with the business census, will present important national, state and city totals on the production of drug grinding, drugs and pharmaceuticals, biologicals and proprietary medicines. Data on this type of manufacture will be presented only by states, but

important totals on the production of major specific commodities in the drug industry will be presented in such a fashion that the medical profession will be able to draw material conclusions on trends in medication in this country. Included here also will be a breakdown between prescriptive and proprietary drugs and medicines.

The Census of Manufactures will also present valuable tables on the production of surgical appliances, rubber goods and other accessories of the doctor and will thus give something of an index of the state of health of the medical and surgical professions as a whole, and changes and trends in the use of various standard appliances and materials.

But the most important of all the censuses to be taken in 1940, for the country as a whole as well as for the physician, will be the sixteenth Decennial Census of Population. This will be the one hundred and fiftieth anniversary of the first population census in America, and, partially in celebration of the event, an effort has been made to have the census schedules more comprehensive, more scientific and more generally useful to every type of person or profession interested in people than ever before. The census itself is a task large enough to stagger the imagination. More than 130,000 enumerators will be employed for a period averaging one month—the month of April—and will be trained in the technics of census taking by 560 district supervisors. To synchronize and supervise operations as a whole, 105 area supervisors will be located in as many key cities to serve as courts of appeal and general managers of the whole enormous project.

Vitally important will be the social, economic and scientific results of the tabulations of specific answers to the various questions on the population census schedules; and it is here that the interests of the medical profession are closely involved. There are two major ways in which the population census is of importance to all physicians:

The first concerns the profession itself. The 1940 census will show, with a high degree of accuracy, exactly what the distribution of doctors is throughout the country. The figures will be presented by states, by cities of 100,000 and over and by cities of from 25,000 to 100,000 and will give the exact numbers of physicians and surgeons, osteopaths, nurses, veterinary surgeons and dentists, as well as such "semiprofessional" classifications as chiropractors, "healers, not elsewhere classified," technicians and laboratory assistants, and physicians', surgeons' and dentists' assistants. By a careful study of these data individual practitioners, state and county medical associations, hospitals and state and municipal public health groups can arrive at sound conclusions concerning the number of doctors in particular areas and the need for more such professional men, if any. The serious problem of the unequal distribution of medical men throughout the country can thus be scientifically approached by means of the census data.

Figures of this sort can obviously be of enormous value not only to the groups that have been named but

to the country's legislative bodies in their attempt to establish higher types of requirements for medical practice and to supply their areas with more ample institutional quarters.

The other part of the population census of especial interest to the medical profession is the general data on distribution of population itself, with especial emphasis on sex and age differentiations. These compilations draw into the picture problems of a broader social interest than those dealing specifically with the profession. The 1940 census will present accurate figures, for instance, on the extent of the decline in the birth rate in the United States and the consequent increase in the number of aged persons. Resulting from this may be many changes of decision on the part of young students in medical schools who might have decided to take up obstetrics or allied branches of medicine or surgery but who will feel that the decline in the birth rate may have catastrophic results on their practice as the trend increases and the number of babies born drops. Hospitals and sanatoriums may find such figures of value in case they plan any expansion, for, as the birth rate declines, the rate and number of aged persons increases, and the need for old age homes and for hospitals devoted to the care of diseases of the aged increases over and above the need for lying-in hospitals.

This whole problem of a declining birth rate is, of course, one of national importance, which has reverberations far beyond the medical profession alone. Similarly the question of the trends in population shift are countrywide in significance, in addition to having a very definite bearing on the question of distribution of medical services. There seems recently to have come a stop to the tendency of people to move to the cities from the farm, but it is impossible to tell, without the data from the 1940 census, how large or how significant this change of trend is.

There are naturally many specific problems in the medical profession on which the census cannot touch, such as professional standards and scientific advances

in surgical technics and the materia medica. Material of this sort is the specific province of the American Medical Association, and its data are more complete, more accurate and more up to date than any similar figures could be when taken on a broad population basis. But it remains that the largest problems confronting the profession are those which are dealt with by the Bureau of the Census in its forthcoming decennial census and in the Division of Vital Statistics in its frequent releases on causes of death, hospital statistics, birth registration and so on.

Certainly if there is one government department of supreme value to physicians as a whole, it is the Bureau of the Census. If all members of the profession will remember this when the census enumerators call on them sometime in April and cooperate to the best of their ability in the filling out of the schedules promptly and accurately, they can be assured that the resultant data will be just that much more valuable to them, once they are compiled and published. And if any of the questions seem to the individual physician to be somewhat personal and private in nature, he should remember that all information collected by the enumerators is held strictly confidential by them and by the statisticians and population scientists in Washington; that they are under oath never to reveal any of the information which goes through their hands either to individuals or to any society, association or government department whatsoever; and that Congress has made the answering of these questions obligatory on the individual, in an effort to assure the country as a whole of accurate, complete and therefore socially valuable statistics concerning the people of America.

With the cooperation of the medical profession freely and willingly granted to the census enumerators, doctors can be assured that the results of the 1940 decennial census will be of such a nature as to aid them greatly in their personal affairs, their local and state problems, and the national problems of health as a whole.

WOMAN'S AUXILIARY

Colorado

The annual meeting of the auxiliary to the Colorado State Medical Society was held in Colorado Springs October 5-7. Dr. H. E. Harms was speaker at the luncheon meeting, which was attended by 120 auxiliary members and guests. More than eighty members attended the first autumn meeting of the auxiliary to the Denver County Medical Society, which was held at the Denver General Hospital October 18.

Florida

The Palm Beach Medical Society and the auxiliary entertained doctors and their wives who attended the third annual meeting of the Southeast District Medical Society in West Palm Beach October 12. An auxiliary to the district medical society was organized, and Mrs. H. A. Leavitt, Miami, was elected president. Speakers at the meeting were Mrs. L. C. Ingram, president of the auxiliary to the Florida Medical Association; Mrs. Leigh Robinson, chairman of the *Hygeia* committee, and Mrs. J. W. McMurray, chairman of the exhibit committee.

Illinois

Mrs. Charles C. Winning, president of the auxiliary to the Illinois State Medical Society, spoke on auxiliary activities at a meeting of the auxiliary to the Vermilion County Medical Society in Danville October 3 and at a meeting of the auxiliary to the Logan County Medical Society in Lincoln October 26.

Group hospital insurance was discussed by Enoch J. Brand at a joint meeting of the Adams County Medical Society and its auxiliary in Quincy October 9. The auxiliary to the Knox County Medical Society met at the Galesburg Club, Galesburg, October 20. Articles from *THE JOURNAL* on the national health program were read, and plans were made for distributing *Hygeia* in the county.

The auxiliary to the Will-Grundy County Medical Society met in Joliet October 10. Reports were given on articles published in *Hygeia* and the *Illinois Health Messenger*. Members were asked to study editorials and sections devoted to medical economics in *THE JOURNAL* and the *Illinois Medical Journal*.

Mrs. W. J. Wanninger, chairman of the *Hygeia* committee of the auxiliary to the Illinois State Medical Society, addressed a group meeting of the auxiliary to the Chicago Medical Society at the home of Mrs. William D. Cutter October 16. Mrs. Wanninger emphasized the importance of placing *Hygeia* in the schools and reading rooms of every community in Illinois. Dr. Charles Papik discussed "An Old Age Plan for Doctors and Their Wives" at a group meeting of the auxiliary to the Chicago Medical Society at the Englewood Hospital.

Members of the Irving Park group of the auxiliary to the Chicago Medical Society met at the Municipal Tubercular Sanitarium, September 26. Addresses were given by Drs. Henry C. Sweeney, Richard M. Davison and Meyer Lichtenstein, members of the staff of the Sanitarium.

ORGANIZATION SECTION

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Iowa
The board of directors of the auxiliary to the Iowa State Medical Society met in Des Moines September 22; Mrs. Edward A. Hanske, Bellevue, is president. Mental hygiene is the topic of study for the year. The Speakers' Bureau, the Hygeia clipping bureau and copies of radio broadcasts on health will be sent by the Committee on Public Relations for its work during the year.

Louisiana
The auxiliary to the Caddo Parish Medical Society met in Shreveport October 11. Mrs. S. M. Blackshear, president of the auxiliary to the Louisiana State Medical Society, spoke on the aims and accomplishments of the state auxiliary. Mrs. Blackshear was speaker also at the first quarterly meeting of the auxiliary to the Lafayette Parish Medical Society in Lafayette October 19. Mr. Gung-Hsing Wang, Chinese vice consul, spoke on "The International Situation Through the Chinese Window" before the auxiliary to the Orleans Parish Medical Society in New Orleans October 11. A committee was formed to do extra work for the Red Cross and to assist in raising funds for the Community Chest.

Dr. John Pracher, president, Ouachita Parish Medical Society, addressed the members of the parish auxiliary at a meeting in

Tennessee
Monroe October 12 on the subject "Blood Transfusion." The auxiliary to the Second District Medical Society met in Norco October 17; Mrs. S. M. Blackshear addressed the members. The wife of every member of the St. Tammany Parish Medical Society is a member of the auxiliary.

The board of directors of the auxiliary to the Tennessee State Medical Association met in Nashville September 29. Following the business session and luncheon, Mrs. Matt B. Murfree, of Murfreesboro, president of the auxiliary, read "The Eulogy of the Doctor," written by Robert Louis Stevenson. The annual social meeting of the Knox County Medical Society and its auxiliary was held September 16 at the home of Dr. and Mrs. J. B. Neil. About 100 physicians and their wives were in attendance.

Wisconsin
More than 125 members and guests attended a meeting of the auxiliary to the Milwaukee County Medical Society in Milwaukee October 13. Prof. Harold Ehrensperger of Northwestern University, Evanston, Ill., spoke on "Drama and Propaganda."

OFFICIAL NOTES

THE NEW YORK SESSION

Section Representatives to the Scientific Exhibit
The various sections of the Scientific Assembly have appointed representatives to the Scientific Exhibit to assist and advise in the procurement and selection of exhibits for the New York session, June 10-14, 1940. The following appointments have been made:

Practice of Medicine—Fred M. Smith, Iowa City.
Surgery, General and Abdominal—Grover C. Penberthy, Detroit.
Obstetrics and Gynecology—H. Close Hesselstine, Chicago.
Ophthalmology—Georgiana Dvorak Theobald, Oak Park, Ill.
Laryngology—Arthur F. Abt, Chicago.
Pediatrics—Daniel S. Cunningham, New York.
Pharmacology and Therapeutics—Wallace M. Yater, Washington, D. C.
Pathology and Physiology—F. W. Konzelmann, Philadelphia.
Nervous and Mental Diseases—F. P. Moersch, Rochester, Minn.
Dermatology and Syphilology—Hamilton Montgomery, Rochester, Minn.
Preventive and Industrial Medicine and Public Health—Paul A. Davis, Akron, Ohio.
Urology—John H. Morrissey, New York.
Orthopedic Surgery—Mather Cleveland, New York.
Gastro-Enterology and Proctology—Sara M. Jordan, Boston.
Radiology—S. W. Donaldson, Ann Arbor, Mich.

Application blanks for space in the Scientific Exhibit may be obtained from the section representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, Ill.

RADIO BROADCASTS

The seventh season of broadcasting by the American Medical Association over the facilities of the National Broadcasting Company and affiliated stations is now under way with programs scheduled each Thursday at 4:30 p. m. eastern standard time (3:30 central standard time, 2:30 mountain time and 1:30 Pacific time). The program is on the Blue network of the National Broadcasting Company, the key station of which is WJZ, New York.

It is impossible to publish a list of topics in advance when programs are developed from last minute proof pages of THE JOURNAL. It is possible to say that future programs under consideration involve one each dealing with progress in medicine, rabies, infantile paralysis, maternal and child health, hospitals, medical education and industrial health. These programs will be as appropriate as possible to the season at which greatest interest in these topics is manifested. The programs on hospitals, medical education and industrial health will correspond with publication dates of special numbers of THE JOURNAL devoted to these topics. The program on medical progress will be broadcast December 28. The programs on maternal and child health will be a part of the spring series.

A special program in cooperation with the National Foundation for Infantile Paralysis, Inc., and the Committee for the Celebration of the President's Birthday is scheduled to appear as the regular program dated January 11. Lists of radio stations which have signified their intention of broadcasting Medicine in the News, according to information received from the National Broadcasting Company, were published in THE JOURNAL, December 2, page 2065.

EDUCATION AND LICENSURE

The thirty-sixth Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held at the Palmer House, Chicago, Feb. 12 and 13, 1940. The Federation of State Medical Boards of the United States will participate in the congress. Topics and speakers are as follows:

Report of the Council on Medical Education and Hospitals.
Ray Lynnan Wilbur, M.D., LL.D., Chairman, Stanford University, Calif.
(Subject to Be Announced.)
Alan Gregg, M.D., Director, The Medical Sciences, Rockefeller Foundation, New York.
Professional Education.
C. S. Boucher, Ph.D., Chancellor, University of Nebraska, Lincoln.
The Goal of Medical Education.
Irvin Abell, M.D., Vice Chairman, Board of Regents, American College of Surgeons, Louisville, Ky.
Graduate Work in Medical Areas.
George D. Stoddard, Ph.D., Dean, Graduate College, State University of Iowa, Iowa City.
Trends in Liberal Arts Education.
George A. Works, Ed.D., Professor of Higher Education, Department of Education, University of Chicago.
The Place of Malignant Disease in the Medical Curriculum.
Ludvig Hektoen, M.D., LL.D., Executive Director, National Advisory Cancer Council, Washington, D. C.
Medical Education—1905 to 1940.
Morris Fishbein, M.D., Editor, JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Chicago.
(Subject to Be Announced.)
Irving S. Cutter, M.D., LL.D., Dean, Northwestern University Medical School, Chicago.
The Work of the National Board of Medical Examiners During Its First Quarter Century.
Louis B. Wilson, M.D., Director Emeritus, Mayo Foundation for Medical Education and Research, Rochester, Minn.
Program for the Instruction of Interns.
Nathan B. Van Eetten, M.D., President-Elect, American Medical Association, New York; Nathan Davis, M.D., New York.
The Recognition of Professional Aims in the Teaching of the Fundamental Medical Sciences.
M. B. Visscher, M.D., Ph.D., Professor of Physiology, University of Minnesota Medical School, Minneapolis.
Role That a Children's Hospital Should Play in the Community.
Alan Brown, M.D., Professor of Pediatrics, University of Toronto Faculty of Medicine, Ontario.
Licensing the Professions.
Miss Frances P. De Lancy, Department of Political Science, West Virginia University, Morgantown.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meetings.—At a meeting of the Third Councilor District Medical Society in Stuttgart October 26 the speakers included Drs. Clyde D. Rodgers, Little Rock, on "Puerperal Disorders in Obstetrics"; Silas C. Fulmer, Little Rock, "Hypertension"; William C. Chaney, Memphis, Tenn., "The Medical Man and His Neurologic Problems," and Henry T. Smith, McGehee, "The Future of Organized Medicine."—The Second Councilor District Medical Society was addressed in Searcy October 19 by Drs. Rufus B. Robins and Samuel A. Thompson, both of Camden, on "Some Remarks on Head Injuries" and "Heart Problems in the Smaller Centers" respectively. Dr. Albert S. Buchanan, Prescott, president of the state medical society, also spoke.—The First Councilor District Medical Society was addressed at Paragould October 17 among others by Drs. Ralph M. Sloan, Jonesboro, on "Premature Separation of the Placenta"; Charles S. Paddock, Memphis, Tenn., "Pyelitis of Pregnancy," and Neuton S. Stern, Memphis, "Acute Angina."

CALIFORNIA

Personal.—Dr. Ruggles A. Cushman has retired as superintendent of the Mendocino State Hospital, Talmage; he served as assistant superintendent of the hospital from 1904 to 1910 and had been superintendent since 1932.

Society News.—At a meeting of the Riverside County Medical Association in Riverside recently Dr. William E. Gardner discussed "Obstructions in Urology."—Among others, Dr. Paul A. Gliebe, San Francisco, spoke on "Psychiatry and the General Practitioner" before the San Joaquin County Medical Society in Stockton recently.—Dr. Emile F. Holman, San Francisco, addressed the San Diego County Medical Society November 14 on "Arteriovenous Aneurysm, Experimental and Clinical Considerations."—Dr. Anton S. Yuskis discussed "Embolie Manifestations of Heart Disease" before the San Diego Galen Club October 24.—At a meeting of the Los Angeles Surgical Society November 10 the speakers were Drs. Ralph T. Richards, Salt Lake City, on "Use of Oxygen and Carbon Dioxide in Surgery"; Verne C. Hunt, "Total Gastrectomy," and Lowell S. Goin, "Observations on Refrigeration Therapy for Malignant Disease."

GEORGIA

Special Society Election.—Dr. Robert L. Rhodes, Augusta, was recently elected president of the Georgia Industrial Surgeons' Association. Other officers are Drs. Richard E. Newberry, Atlanta, vice president, and John W. Simmons, Brunswick, secretary.

Personal.—Dr. Robert C. Pendergrass has been appointed director of a newly organized cancer clinic in Americus.—Dr. Jack R. McMichael, Quitman, has been appointed a member of the state board of health.—Dr. Clarence L. Ayers, Toccoa, has been appointed a member of the state board of health for a six year term.

Annual Pediatric Meeting.—The Georgia Pediatric Society will hold its annual scientific session in Atlanta December 16. The speakers will include Drs. George M. Lyon, Huntington, W. Va., on "Meningococcic Meningitis and Its Management" and "Purulent Meningitis Due to Other Than the Meningococcus"; Harry Bakwin, New York (subjects not announced), and Charles F. McKhann, Boston, "Poliomyelitis" and "Progress in the Control of Respiratory Infections." Dr. Lewellyn H. Muse, Atlanta, is president of the society and Dr. Don F. Cathcart, Atlanta, secretary-treasurer.

ILLINOIS

Society News.—Dr. Oliver E. Van Alyea, Chicago, discussed "Irrigation of the Frontal and Maxillary Sinuses" before the Rock River Valley Eye, Ear, Nose and Throat Society in Rockford November 21.—Dr. Frederick A. Jostes, St. Louis, discussed "Backache: A Manipulative Treatment Without Anesthesia" at a meeting of the Adams County Medical Society in Quincy November 13.

Chicago

New Position at Cook County Hospital.—Dr. Marshall Davison, chairman of the surgical division of Cook County Hospital, has been appointed medical director of the hospital, a newly created position. In this capacity Dr. Davison will coordinate and correlate activities of the staff and have jurisdiction over all medical and surgical work at the hospital. Dr. Karl Meyer will continue as medical superintendent. Dr. Davison graduated at the University of Illinois College of Medicine in 1920. He is assistant professor of surgery at Northwestern University Medical School.

INDIANA

Changes in Health Officers.—Dr. Wendell C. Anderson, Mentone, has been appointed director of the district health department, covering Dubois, Spencer, Orange, Crawford and Perry counties, with headquarters in Huntingburg. He succeeds Dr. Chester A. Hicks. Dr. Lewis C. Robbins, formerly of Baltimore, has been placed in charge of the district health unit covering Monroe, Brown and Lawrence counties, with headquarters in Bloomington. He succeeds Dr. Henry G. Steinmetz, who has received a fellowship in public health at Johns Hopkins University.

District Meetings.—At a meeting of the Thirteenth District Medical Society November 8, Laporte, Drs. Fred W. Bailey, St. Louis, among others, discussed diagnosis and treatment of nonpenetrating intra-abdominal injuries, and Edwin M. Miller, Chicago, treatment of severe fractures of the elbow in children.—The Seventh District Medical Society was addressed in Martinsville November 15 by Drs. Carl P. Huber, Indianapolis, on "Toxemias of Pregnancy"; Maurice L. Blatt, Chicago, "Care of the Premature and Newborn Infant"; Robert M. Moore, Indianapolis, "Some Helpful Clinical Observations in Angina Pectoris"; Karl R. Ruddell, Indianapolis, "Acute Appendicitis." Dr. M. Herbert Barker, Chicago, addressed the dinner session on "Management of Pneumonia in Children and Adults."

KANSAS

Lectures on Medical History.—The Kansas University School of Medicine, in commemoration of the opening of its new library and museum of medical history, is presenting a series of lectures on medical history. Dr. Sanford V. Larkey, librarian of the William H. Welch Memorial Library, Johns Hopkins University School of Medicine, Baltimore, gave the first lectures October 9 on "Primitive Medicine" and "Egyptian Medicine." Other lecturers include:

Dr. John Farquhar Fulton, New Haven, Conn., January 15, History of Physiology.
Dr. Henry E. Sigerist, Baltimore, March 4, Methods of Medical History and the Future of Medicine in the Light of History.
Chauncey D. Leake, Ph.D., San Francisco, March 11 (date tentative), History and the Development of Therapeutic Drugs and the History of Anesthesia.

MARYLAND

University News.—Dr. Charles Edward Smith, associate professor of public health and preventive medicine, Stanford University School of Medicine, San Francisco, delivered a public lecture at the Johns Hopkins School of Hygiene and Public Health, Baltimore, November 7, on "Epidemiology of Acute Coccidioidomycosis with Erythema Nodosum ('San Joaquin' or 'Valley Fever')." This was one in the series of the De Lamar Lectures in Hygiene.

Society News.—A symposium on Rocky Mountain spotted fever was presented before the Baltimore City Medical Society November 3 by Drs. Thomas Nelson Carey, Charles H. Halliday and Rolla E. Dyer, U. S. Public Health Service. At a day and night meeting November 17 Drs. Warfield M. Firor and George W. Thorn discussed "The Modern Treatment of Addison's Disease" and Dr. Edward S. Stafford, "Mortality from Appendicitis."—Dr. William S. Love Jr., Baltimore, discussed symptomatology, diagnosis and treatment of coronary thrombosis before the Harford County Medical Society in Bel Air recently.

Study of Hearing of School Children.—A study of selected school children to detect impaired hearing will be carried out in the Eastern Health District, according to Baltimore *Health News*. The work will be done under the supervision of Dr. Samuel J. Crowe, adjunct professor of laryngology and otology, Johns Hopkins University School of Medicine, Baltimore, and his staff in collaboration with the departments of education and health and the Eastern Health District. The study will involve careful examination, including

an audiometric test, of 1,000 or more school children between the ages of 8 and 12. When found necessary, arrangements for adequate treatment will be made after consulting and receiving approval from the children's parents and family physicians.

MASSACHUSETTS

Conference on Physical Medicine.—The New England Society of Physical Medicine held a clinical conference November 8-10 at Boston and the Massachusetts Institute of Technology, Cambridge, November 10. Among the speakers were:

Dr. Harold E. Himwich, Albany, N. Y., Nitrogen Therapy, Physiologic Aspects in Schizophrenia.
Drs. Charles W. McClure and Isaac R. Jankelson, Boston, Gastroscopy.
Dr. Temple S. Fay, Philadelphia, Observations on Human Refrigeration.
Drs. Curtis T. Prout, Arlington Heights, Mass., and John G. Gibson II, Boston, Fever Therapy.

There were symposiums on galvanism and the sinusoidal currents, high frequency currents, phototherapy and massage and corrective exercise. At the banquet, Harold E. Edgerton, Ph.D., discussed "Seeing the Unseen with Stroboscopic Photography" and George R. Harrison, Ph.D., "Modern Physics and the Modern Physician." Dr. Henry A. Tadgell, Wrentham, is president of the society and Dr. William D. McFee, Boston, secretary.

MISSISSIPPI

Society News.—The Northeast Mississippi Thirteen Counties Medical Society was addressed recently, among others, by Drs. James A. Watt, Aberdeen, on "Migraine, Its Present Day Concept and Treatment"; Claud F. Gilbert, Corinth, "Pre-natal Care"; Luther L. McDougal Jr., Paris, Texas, "Feeding a Normal Infant," and Cecil D. Gaston, Birmingham, Ala., "Hemorrhoidectomy, Essentials in the Prevention of Postoperative Pain."

Health Department Activities.—Full time health departments will soon be established in Marion, Lowndes, Tate, Noxubee and Newton counties to bring the total of full time health units in the state to forty-four, newspapers announce. Dr. Robert H. Bostwick Jr., Indianola, has been made director of the Union County health department succeeding Dr. Edwin M. Butler, Liberty, who plans to enter private practice. Dr. James P. Ward, Charleston, director of Tallahatchie County, has been appointed director of the Washington County health department, effective October 15, succeeding Dr. Benjamin F. Hand Jr., who resigned to engage in private practice in Greenville, it is reported. Dr. Everett W. Ryan, Canton, formerly director of the Madison County health unit, is being transferred to Charleston to direct the Tallahatchie department.

MISSOURI

Personal.—Dr. Henry H. Sweets Jr., Louisville, Ky., has been appointed to the staff of the University of Missouri School of Medicine, succeeding Dr. James H. Peers, who recently resigned as assistant professor of pathology. Dr. Charles Wesley Burrill, Kansas City, said to be the oldest living member of the Jackson County Medical Society, was honored by friends October 21 in observance of his ninety-fourth birthday.

Society News.—At a meeting of the St. Louis County Medical Society November 22 the speakers were Drs. Peter Heinbecker on "The Surgical Treatment of Hypertension"; Nathan A. Womack, "Recent Advances in the Knowledge of Cancer," and Robert Elman, "Surgical Treatment of High Intestinal Obstruction in Infants."—Dr. William S. McCann, Rochester, N. Y., will address the Kansas City Academy of Medicine December 15 on "Modern Trends in the Study of Kidney Disease." Dr. Harold E. Himwich, Albany, N. Y., discussed "Brain Metabolism" before the academy November 17.—Dr. Oscar V. Batson, Philadelphia, addressed the Kansas City Society of Ophthalmology and Otolaryngology December 7-8 during its postgraduate session on anatomy.

Neuropsychiatrist Honored.—A meeting of the St. Louis Medical Society October 24 was held in honor of Dr. William W. Graves, professor and director of the department of neuropsychiatry, St. Louis University School of Medicine, St. Louis. At this time he was presented with a certificate of merit and a gold medal. The award of merit points out that Dr. Graves' work "resulted in new approaches to the qualitative evaluation of inherited variations in relation to the inherited predisposition of human constitution, expressed in inherited predisposition to health or disease, and in inherited capacity for education, for adaptability, and for longevity." The society has conferred this

honor on only two previous occasions: In 1927 to Dr. Evarts A. Graham and his associates, Drs. Glover H. Copher, St. Louis, Warren H. Cole, now of Chicago, and Sherwood Moore, St. Louis, for their work in cholecystography, and in 1935 to Edward A. Doisy, Ph.D., for his achievements in hormone chemistry and physiology.

NEVADA

Changes in State Board.—New members of the Nevada State Board of Medical Examiners are Drs. Frederick M. Anderson, Carson City; John Vernon Cantlon, Reno, and George R. Magee, Yerington. Drs. Robert P. Roantrce, Elko, and Ralph A. Bowdle, East Ely, continue as members. Dr. Roantrce is president and Dr. Anderson is secretary.

NEW YORK

Personal.—Dr. John Maxwell Chamberlain, formerly of Ann Arbor, Mich., has been appointed principal thoracic surgeon on the staff of the division of tuberculosis in the state department of health, Albany.—Dr. James Bernard Lawler, Vernon, has been appointed health officer of the township, except the city of Sherrill, succeeding Dr. Gary M. Lewis, who had served for sixty years except for a short period.

Society News.—Mr. J. George Crownhart, executive secretary, State Medical Society of Wisconsin, Madison, addressed the Medical Society of the County of Westchester at White Plains at its annual meeting November 21 on "Sickness Insurance in Europe."—Dr. Carl Eggers, New York, addressed the Medical Society of the County of Albany November 15 on "Carcinoma of the Breast."—Dr. John S. Lawrence, Rochester, addressed the Rochester Pathological Society November 14 on "Toxic Effects on the Blood of Sulfanilamide and Allied Drugs."—Dr. Walter C. Alvarez, Rochester, Minn., addressed the Rochester Academy of Medicine November 1 on "The Patient Who Remains Sickly in Spite of Long and Strenuous Treatment."—Dr. Jesse G. M. Bullowa, New York, addressed the Dutchess County Medical Society, Poughkeepsie, November 8 on "The Appropriate Treatment for the Pneumonias—Individualizing the Case."—Drs. John E. Free and Jay E. Meeker, Ogdensburg, addressed the Medical Society of the County of St. Lawrence in Potsdam November 2 on "Surgery of the Chest" and "Delivery of the Occiput Through a Presenting Cervix" respectively.

New York City

New Officers of Rockefeller Institute.—Dr. Warfield T. Longcope, Baltimore, was elected president of the board of scientific directors of the Rockefeller Institute for Medical Research at a meeting October 28. He succeeds the late Dr. Charles R. Stockard. Dr. Ross G. Harrison, New Haven, Conn., was elected a member of the board.

Society News.—A symposium on empyema was presented before the Brooklyn Thoracic Society November 24 by Drs. William H. Field, Henry W. Louria, Herbert C. Maier and Harry B. Reibstein.—At the first fall meeting of the International Spanish-Speaking Association of Physicians November 10 the speakers were Drs. Felipe Carranza, Buenos Aires, on "Treatment of Cancer of the Rectum"; Irving W. Potter, Buffalo, "Prevention of Maternal Deaths," and Nathaniel M. Levin, Philadelphia, "Speech Following Radical Removal of the Larynx."

Dr. Rose Honored.—Mary Swartz Rose, Ph.D., professor of nutrition, Teachers College, Columbia University, received the annual award of the Associated Grocery Manufacturers of America at the recent annual convention in New York. Dr. Rose was honored, the citation said, in recognition of her contributions to the science of nutrition, the part she has played in the dissemination of scientific information concerning foods, her authorship in this field and her outstanding career as a teacher of others who teach nutrition. Dr. Rose is a member of the Council on Foods of the American Medical Association.

Lectures to the Laity.—The New York Academy of Medicine began its fifth annual series of lectures to the laity November 30 with an address by Dr. Abraham Myerson, Boston, on "The Inheritance of Mental Disease." The series will continue as follows:

Dr. Richard H. Hutchings, Utica, N. Y., The Ascent from Bedlam, December 28.
Dr. Paul Reznikoff, New York, The Story of Our Knowledge of the Blood, January 25.
Drs. Chevalier Jackson and Chevalier L. Jackson, Philadelphia, The Romance of Bronchoscopy, February 29.
Dr. Thomas M. Rivers, New York, The Story of the Viruses, March 28.
Dr. Perrin H. Long, Baltimore, Chemical Warfare Against Disease, April 25.

Knapp Hospital Merged with Columbia.—Announcement is made of the merger of the Herman Knapp Memorial Eye Hospital with the Columbia-Presbyterian Medical Center. The hospital activities and care of patients now carried on by the Knapp Hospital at 500 West Fifty-Seventh Street will be taken over by the Presbyterian Hospital and the Vanderbilt Clinic. The hospital's assets and funds will be conveyed to Columbia and will be administered as the Knapp Memorial Foundation in Ophthalmology, the income of which will be used for graduate study, teaching and research in ophthalmology. The Herman Knapp Memorial Eye Hospital was founded in 1869 by Dr. Knapp as the New York Ophthalmic and Aural Institute. In 1909 Dr. Knapp was succeeded as executive surgeon by his son Dr. Arnold Knapp, and in 1913 the hospital became the Herman Knapp Memorial Eye Hospital with a new building situated near Columbia University College of Physicians and Surgeons. More than 800,000 patients have been treated at the hospital, 730,000 in the outpatient department and 70,000 inpatients, 76 per cent of whom were treated free, it was stated in the announcement. Dr. Herman Knapp was professor of ophthalmology at the University of Heidelberg, Germany, before he came to the United States in 1868. He died in 1911.

OHIO

The Annual Lower Lecture.—The second annual Lower Lecture of the Academy of Medicine of Cleveland was delivered November 17 by Dr. George H. Whipple, Rochester, N. Y., in the Cleveland Medical Library auditorium. Dr. Whipple's subject was "Hemoglobin Building in Anemia with Particular Reference to Iron."

Toledo University Institute.—The Sixth Annual Postgraduate Day of the Medical Institute of Toledo University was held November 3. The lecturers were Drs. Willard O. Thompson and Harry E. Mock, Chicago, who made three addresses each. Dr. Thompson's subjects were: "Treatment of Undescended Testes and Hypogonadism," "Treatment of Addison's Disease" and "Treatment of Toxic Goiter." Dr. Mock's were: "Treatment of Injuries with Special Attention to Lacerations and Tendon Sutures," "Treatment of Shock" and "Treatment of Head Injuries."

Personal.—Dr. Elmer G. Horton, who recently retired as clinical professor and chairman of the department of pediatrics at Ohio State University College of Medicine, Columbus, was honored at a dinner October 19 attended by 270 Ohio physicians and guests. Mr. Horace S. Kerr, Columbus attorney, was toastmaster, and the speakers included William McPherson, LL.D., acting president of the university, Drs. Elijah J. Gordon, John W. Wilce and Harry E. LeFever.—Dr. William K. Ruble, Wilmington, health commissioner of Clinton County since 1921, has retired.—Dr. Albert Graeme Mitchell, Cincinnati, has been appointed a member of the committee on education of the National Foundation for Infantile Paralysis.

PENNSYLVANIA

Outbreak of Scarlet Fever.—Schools were closed November 14-27 in Chester because of an outbreak of scarlet fever. More than sixty cases had been reported up to November 16. Seven of the patients were adults.

Postgraduate Day in Harrisburg.—A Postgraduate Day was held at the Harrisburg Academy of Medicine, Harrisburg, November 16, with the following speakers:

- Dr. Charles C. Higgins, Cleveland, Management of Patients with Renal Lithiasis.
- Dr. Alexander H. Colwell, Pittsburgh, Intrathoracic Tumors.
- Dr. Randle C. Rosenberger, Rahns, Interesting Facts Concerning Viruses and Viral Diseases.
- Dr. George P. Müller, Philadelphia, Surgical Treatment of Peptic Ulcer.

After a dinner at the Harrisburg Country Club Dr. Colwell spoke on "The House in Order" and Dr. Rosenberger, "Students I Have Met, or Trials and Tribulations of a Teacher."

Philadelphia

Personal.—Detlev W. Bronk, Ph.D., director of the Eldridge R. Johnson Foundation for Medical Physics and of the Institute of Neurology, University of Pennsylvania School of Medicine, has been appointed managing editor of the *Journal of Cellular and Comparative Physiology* of the Wistar Institute of Anatomy and Biology. He succeeds Edmund Newton Harvey, Ph.D., Princeton University, Princeton, N. J.

Medical Economics and Health.—The Philadelphia County Medical Society held a "health and medical economics night" November 8 with the following speakers: Dr. John J. Shaw, state secretary of health, on "Activities of the Department of Health of the Commonwealth of Pennsylvania"; Hon.

J. William Ditter of Montgomery County, "The Congressman Looks at the Doctor," and Dr. Arthur C. Christie, Washington, D. C., "The Physician's Responsibility for Medical Progress."

Annual Women's Cancer Forum.—The annual cancer forum under the auspices of the Women's Auxiliary of the Lankenau Hospital Research Institute was held at the Bellevue-Stratford November 28-29. The auxiliary was assisted by District No. 1 of the Pennsylvania State Nurses Association, with the cooperation of various health and medical organizations. Several groups presented exhibits on facts and research into the cancer problem. One session, was devoted to seminars led by physicians interested in special phases of cancer. Among out of town speakers was Harold S. Burr, Ph.D., New Haven, Conn., on "Electricity in Cancer."

Pittsburgh

Hospital News.—Montefiore Hospital held its annual "Scientific Day" November 18 with Dr. Charles R. Austrian, Baltimore, as the guest speaker. Short papers and cases were presented at the hospital during the day and Dr. Austrian spoke in the evening at the Concordia Club on "Diagnosis and Treatment of Chronic Nontuberculous Pulmonary Infections."

Society News.—Speakers before the Pittsburgh Urological Association November 13 were Drs. Isaac L. Ohlman, on "Carcinoma of the Ureter"; David H. Ruben, Washington, Pa., "Carcinoma of the Ureter; Ten Year Cure" and Howard L. Tolson, Cumberland, Md., "Prostatic Resection with a Modification of Young's Punch."—At a meeting of the Pittsburgh Surgical Society November 17 the speakers were Drs. John W. Shirer on "Preliminary Report on Peritoneoscopy; A New Diagnostic Method for Diseases of the Abdominal Cavity"; Dominic N. Di Silvio and Morris A. Slocum, "A Survey of 695 Herniographies," and John W. Fredette, "Chronic Dislocations of the Shoulder Joint with Special Reference to Technic of Operation for Repair."

RHODE ISLAND

Changes in Hospital Superintendents.—Dr. Dennett L. Richardson has resigned as superintendent of the Charles V. Chapin Hospital, Providence, to become superintendent of the Rhode Island Hospital, Providence, effective January 1. Dr. Richardson will succeed Dr. William O. Rice, who has resigned to take up other work.

Society News.—Drs. Champ Lyons, Boston, and Samuel Morein addressed the Providence Medical Association November 6 on "Chemotherapy and Immunology of Pyogenic Infections" and "Newer Aspect of the Medical Treatment of Gastric and Duodenal Ulcers" respectively. Dr. Allen Greenwood, Boston, was the speaker October 2 on "Eye Diseases Related to General Medicine and Surgery."

Course in Psychiatric Nursing.—The Emma Pendleton Bradley Home, East Providence, announces a postgraduate course in the practical nursing care of neuropsychiatric disorders of childhood. The course will run through twelve weeks beginning the first of January, April, July and October and will be limited to two nurses for each period. Details may be obtained from Dr. Arthur H. Ruggles, superintendent; Dr. Charles Bradley, medical director, or Kathleen Thornton, R.N., director of nursing. The Bradley Home is a fifty bed hospital dealing exclusively with neurologic and behavior disorders of children under 13 years of age.

TENNESSEE

Monument to a Family Doctor.—A monument to the memory of Dr. William P. Moore Jr., Portland, Tenn., who served the community for about fifty years, was unveiled October 29. The memorial was erected through the contributions of his patients and friends and dedicated with an address by Dr. William D. Haggard, Nashville. Dr. Moore died in 1932, aged 75.

Personal.—Dr. Bedford F. Peterson, assistant superintendent of the Eastern State Hospital, Knoxville, has been appointed superintendent of the Western State Hospital near Bolivar, it is reported.—Dr. William D. Martin, head of the division of criminal insane at Central State Hospital, Nashville, has been appointed superintendent of the Eastern State Hospital, Knoxville; he succeeds Dr. Oscar S. Hauk, who was transferred to the central institution as superintendent.

Conference of Southern Pathologists.—The Sixth Conference of Southern Pathologists was held at the University of Tennessee College of Medicine, Memphis, November 20. The speakers were Drs. William R. Mathews, Shreveport, La., on

"T. Charles W. Duval, New Orleans, and Bacteriology as One Subject" and Washington, D. C., "The Present Day Status of Clinical Pathology and Problems of the Clinical Pathologist," and Ernest W. Goodpasture, Nashville, unusual infections of the intestine. Orren W. Hyman, Ph.D., dean of the medical school, spoke at the luncheon, and the group was entertained at dinner by Dr. Harry C. Schmeisser.

Regional Meeting.—The Middle Tennessee Medical Association held its semiannual meeting in Springfield November 16 with the following speakers, among others:

- Dr. Nathaniel S. Shofner, Nashville, The Factors of Safety in Thyroid Surgery.
- Dr. Robert B. Gaston, Lebanon, Pelvic Endometriosis.
- Dr. Albert Weinstein, Nashville, Experiences with the Use of Sulfanilamide in the Treatment of Undulant Fever.
- Dr. Roscoe C. Kash, Lebanon, Observations on the Transmission of Infantile Paralysis.

TEXAS

Dallas Clinical Conference.—The Dallas Southern Clinical Society announces the following speakers for its twelfth annual Spring Clinical Conference to be held March 11-14 at the Hotel Adolphus:

- Dr. Marion A. Blankenhorn, Cincinnati, medicine.
- Dr. Chester S. Keefer, Boston, medicine.
- Dr. Warren H. Cole, Chicago, surgery.
- Dr. Frank E. Adair, New York, surgery, tumors.
- Dr. Clay Ray Murray, New York, fractures, traumatic surgery.
- Dr. John W. Harris, Madison, Wis., obstetrics and gynecology.
- Dr. Meredith F. Campbell, New York, urology.
- Dr. Frank E. Stevenson, Cincinnati, pediatrics.
- Dr. Tracy B. Mallory, Boston, pathology.
- Dr. Walter A. Fansler, Minneapolis, proctology.
- Dr. Parker Heath, Detroit, ophthalmology.
- Dr. Millard F. Arbuckle, St. Louis, otolaryngology, bronchoscopy.

District Meetings.—The Panhandle District Medical Society met recently in Lubbock with Dr. John W. Ames, Denver, as guest speaker on the scientific program on "Diagnosis of the More Common Skin Affections in Infants and Children," and in the evening on "A Close-up of Dictators."

—The Fourth District Medical Society held its annual meeting in Brady in October. Among the speakers on the scientific program were Drs. Oren H. Chandler, Ballinger, on "Liver Extract as a Therapeutic Agent"; Samuel Foster Moore Jr., San Antonio, "Newer Concepts in Estrogenic Therapy"; Victor E. Schulze, San Angelo, "Experiences in the Use of Sulfapyridine in Pneumonias," and Joseph F. McVeigh, Fort Worth, "Abnormal Cardiac Rates and Rhythms." Dr. Leopold H. Reeves, Fort Worth, president of the State Medical Association of Texas, spoke on "Present Day Problems of Organized Medicine" and Dr. Samuel E. Thompson, Kerrville, on "Socialized or Governmental Medicine."

WASHINGTON

New Health Officers.—Dr. Thomas H. Biggs, Chehalis, has been appointed district health officer for Grant and Douglas counties in Oregon and Dr. John B. Porter, formerly of Omaha, Neb., county health officer for Kitsap County to succeed Dr. Thomas C. Baldwin, Port Orchard.

State Health Survey.—Adolph J. Roth, Dr.P.H., formerly assistant professor of bacteriology and public health at Washington State College, Pullman, has been selected to conduct a health education survey under the auspices of the public health committee of the State Planning Council, according to *Northwest Medicine*. The survey is preliminary to establishment of health education recommendations for the public schools and state educational institutions.

WISCONSIN

Director of Mental Hygiene Appointed.—Dr. Gilbert E. Seaman, superintendent of the Winnebago State Hospital, has been appointed acting director of the division of mental hygiene in the new state department of public welfare established by the 1939 legislature. Morris G. Caldwell, Ph.D., Lexington, Ky., was appointed director of corrections.

Society News.—Drs. Willard L. Wood, Chicago, and Stanley J. Seeger, Milwaukee, addressed the Medical Society of Milwaukee County November 10 on "Arthritis" and "Some Technical Points in Pediatric Surgery" respectively.—A symposium on biliary surgery was presented before the Milwaukee Society of Clinical Surgery November 28 by Drs. Max Thorck, Chicago, and Armand J. Quick and William J. Carson, Milwaukee.

GENERAL

Sedgwick Medal Awarded to Dr. Parran.—The Sedgwick Medal, awarded annually by the American Public Health Association for distinguished service in public health, was presented at the recent annual meeting to Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, Washington, D. C. The presentation was made by Dr. Milton J. Rosenau, director of the division of public health, University of North Carolina School of Medicine, Chapel Hill.

Congress on Pediatrics Postponed.—The American officers of the Fifth International Congress of Pediatrics, which was scheduled to be held in Boston Sept. 3-5, 1940, have decided that the international situation is such at present that it seems advisable to postpone the congress to an indefinite date. Dr. Henry F. Helmholz, Rochester, Minn., is president of the congress, Dr. Kenneth D. Blackfan, Boston, general secretary, and Dr. Charles F. McKhann, Boston, assistant secretary.

Radiological Society Meeting.—The annual meeting of the Radiological Society of North America will be held in Atlanta December 11-15 at the Atlanta-Biltmore Hotel, under the presidency of Dr. Raymond G. Taylor, Los Angeles. Refresher courses are to be conducted each morning throughout the week from 8:30 to 10:30. General sessions will be held in the mornings and separate sessions for diagnostic and therapeutic subjects in the afternoons. Dr. Francis Carter Wood, New York, will deliver the Carman Lecture Tuesday evening December 12 on "The Biological Effects of Radiation."

Infantile Paralysis Campaign.—The 1940 campaign for funds to fight infantile paralysis will again have two principal features, celebrations in honor of President Roosevelt's birthday, January 30, and the "March of Dimes," according to an announcement of the Committee for the Celebration of the President's Birthday. Mr. Keith Morgan, New York, is again national chairman and has appointed chairmen for all the states and territorial possessions. The celebrations will include dances, parties and entertainments of all kinds. A special feature will be the "March of Sports," a series of sports events under the general direction of Grantland Rice. The funds will be distributed on the same plan as last year, one half to the National Foundation for Infantile Paralysis and the other half to the localities where the money is raised.

Laboratory Directors Reorganize.—The Conference of Laboratory Directors, meeting during the annual convention of the American Public Health Association in October, changed its name and expanded under a new constitution and by-laws. The new name is Conference of State and Provincial Public Health Laboratory Directors. Full membership is limited to directors of official public health laboratories, while associate membership has been made available to the responsible assistants of directors of state and provincial laboratories and to the directors and responsible assistants in municipal and other official public health laboratories in the United States and Canada. Friend Lee Mickle, Sc.D., Wethersfield, Conn., was elected president; Mr. L. F. Ey, Columbus, Ohio, vice president, and Miss Katherine E. Cox, Charleston, W. Va., secretary.

Special Society Elections.—Dr. Gerald H. McMahon, Detroit, was elected president of the International Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions at the eighteenth annual meeting in New York in October. Dr. William M. Doody, Jersey City, N. J., was named vice president and Dr. John J. White, New York, secretary.—Dr. H. Earle Conwell, Birmingham, Ala., was elected president of the Clinical Orthopaedic Society at its recent annual session in Oklahoma City and Little Rock, Ark. Dr. Conwell was formerly secretary-treasurer of the society. Other officers are Drs. Charles A. Stone, St. Louis, vice president, and Myron O. Henry, Minneapolis, secretary-treasurer. The next annual session will be held in Milwaukee and Madison, Wis.—Dr. Jennings C. Litzberg, Minneapolis, was elected president of the Central Association of Obstetricians and Gynecologists at the annual meeting in Kansas City, Mo., in November. Drs. Thomas B. Sellers, New Orleans, and Edward P. Allen, Oklahoma City, were elected vice presidents and Dr. William F. Mengert, Iowa City, secretary. The 1940 convention will be in Indianapolis.—Dr. Leon Banov, Charleston, S. C., was chosen president of the International Society of Medical Health Officers at the annual meeting in Pittsburgh October 16; other officers are Drs. James R. Roberts, Hamilton, Ont., Canada, and Angel de la Garza Brito, Mexico City, vice presidents, and Dr. Irl C. Riggan, Richmond, Va., secretary-treasurer.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 4, 1939.

The Treatment of Air Raid Casualties

The organization for the treatment of the large number of air raid casualties expected among civilians has been described in previous letters. As no such raids have occurred we have had no experience with the arrangements, but the recent civil war in Spain seems to show that some modification is desirable. A well attended meeting of the Royal Society of Medicine was addressed by Dr. Trueta, formerly director of the department of surgery of the General Hospital of Catalunya, Barcelona, on the organization of hospital services for casualties due to the bombing of cities. He said that the numerous air raids on Barcelona had led the medical authorities to alter their organization as experience demanded. When it was found that first aid posts separate from the hospitals delayed complete treatment and increased mortality, they were abandoned. The wounds caused by the explosion of heavy bombs were severe and only few of the injured survived. Transportation was difficult, for movement increased shock and hemorrhage. Dispatch to the nearest hospital for complete treatment was the only measure that could save life. Those injured in the collapse of buildings from explosions also needed immediate assistance and even then the mortality was high. Persons should receive hospital treatment within two hours of the injury. Trueta strongly urged that first aid posts should be located in the hospitals. More than 30 per cent of the patients needed operation, and whatever facilitated rapid admission to a hospital contributed to success. The immediate intervention of the surgeon was the only useful form of first aid other than the application of a tourniquet for excessive bleeding. The application of splints, bandages and other forms of first aid at isolated posts was not only useless but dangerous because it delayed surgical treatment. A perfect circulation of ambulances was necessary. The casualties should be classified into five groups: (1) those who required immediate operation and who could not be sent out immediately; (2) those who required immediate operation and could be evacuated immediately; (3) those who needed immediate treatment and rest without operation and could not be evacuated; (4) those who after first aid could be transferred to the base hospital; (5) those who could go home after first aid.

In the classification room a colored card should be attached to each injured person. The director of the classification unit should know the number of surgeons and operating tables available and the specialty of each, so that the cases might be distributed according to capacity and with some regard to the pressure on each operator. Trueta's address made a great impression. It was thought that his principles would revolutionize treatment in air raid casualties.

Dispensing with Foreign Pharmaceutic Products

Many of the pharmaceutic products used in this country are of foreign origin, especially German. We must now depend on our own resources, which are greater than has been generally realized. During recent months, steps have been taken to meet any possible deficiency. The Association of British Chemical Manufacturers has published a long schedule showing that a British product equivalent to almost every foreign one is available. This should not be difficult, as most of the extensively advertised foreign preparations are only chemical substances masquerading under a proprietary name. The British ones are claimed as having the same essential composition as

the foreign or as having similar therapeutic properties and capable of replacing the foreign products. One firm has made arrangements to obtain supplies manufactured in the United States when its present foreign supply, which is considerable, has been exhausted.

Hospital for War Blinded Men

Before the outbreak of war it was decided at a conference between representatives of the fighting services, the Ministry of Pensions and the Ministry of Health to convert the convalescent home of St. Dunstan's Hospital into a war hospital for those who may be blinded in the present war. St. Dunstan's is known throughout the world for its care of those blinded in the great war. It was founded by Sir Arthur Pearson, a journalist who had become blind. The new hospital is situated on the downs near Brighton and has accommodations for 200 cases. It contains a small but perfectly equipped operating room in a part of the hospital erected at a cost of \$35,000, thanks to the generosity of Lord Nuffield. A staff from Moorfields, the principal ophthalmic hospital in the empire, is in residence. Plans are in hand to extend the hospital, if the need arises, and to enlarge the present school so that all the young blinded men may learn to read with their fingers, to typewrite, to look after themselves and to walk alone. The blinded men of the great war will hold out a helping hand to the young men who will join their ranks and take an active part as lecturers and teachers. There will be workshops and lecture rooms where trades, handicrafts and professions will be taught. The government will provide pensions for those blinded in the war and, as in the last war, St. Dunstan's will help them to recreate their lives. Of the 2,750 who were treated here, 2,000 are still alive.

The Evacuation of Sanatoriums for Tuberculosis

The council of the National Association for the Prevention of Tuberculosis has called attention to the danger of the evacuation of sanatoriums and hospitals for tuberculosis, which has taken place all over the country as part of the scheme to provide hospitals for the wounded. The patients have been distributed in their homes and many of them are infective to others. The council says that an infective case of pulmonary tuberculosis may in time cause as much harm as a bomb. Cases are known in which, after previous warning, a sanatorium has been evacuated at forty-eight hours' notice, and the council asks whether many of the beds might not still be used for tuberculous patients and evacuation done when the necessity arises. Another point is that tuberculosis will undoubtedly occur in members of the fighting forces, for whom sanatoriums should be available to the greatest possible extent.

PARIS

(From Our Regular Correspondent)

Oct. 29, 1939.

The Prognosis in Chronic Ascites

Cirrhotic ascites is rarely curable. Cases regarded as cures are generally remissions of long duration. Kervarec recently described before the Société de médecine de Paris the case of a woman aged 50 suffering from hypertrophic cirrhosis with ascites and enormous edema. She had undergone fifty-four punctures within eighteen months, in the course of which 779 quarts of peritoneal fluid were drained. The ascites had not reappeared for nine years. She had pneumonia in 1935 but in spite of hypertension (230/130) her condition was satisfactory. The prognosis of recent cirrhosis is more favorable than that of older cases, and the hypertrophic type heals more frequently than the atrophic. Icterus seriously aggravates the situation. Three kinds of symptoms signify the cure or evolu-

tion of ascites: First, the more or less rapid disappearance of portal hypertension is a factor which permits an improved outlook. Furthermore, the restoration of a normal relation between the blood serum and erythrocytes indicates a return to equilibrium in protein metabolism. In the third place, biologic tests show the persistence of hepatic insufficiency even after improvement that looks like a cure. Maillard's coefficient (Lanzenberg's acidosis coefficient) and urobilinuria remain quite high. On the other hand, experimental tests for galactosuria remain satisfactory.

The Rickettsias

In a recent session of the Société de pathologie exotique, Paul Giroud and R. Pauthier reproduced specimens of conjunctival cells in which it was difficult to distinguish the Rickettsias of classic morphology from the bacteria modified by phagocytosis, clearly a potential cause of error for those who study the connection between trachomas and Rickettsias. At the same meeting Etienne Burnet voiced his skepticism of the role the Rickettsias play in the study of trachomas. He believes that the trachoma agent is a corpuscular virus of the same type as those of psittacosis and acute lymphogranuloma, a point of view derived from the descriptions of Halberstadter and Prowasek. The recently described Rickettsias cannot be accepted, at least as Rickettsias. They differ too much from the micro-organisms for which this name was coined. Either they are not Rickettsias at all or they belong to a species other than those whose presence in typhus has been ascertained. Weigl, on the other hand, has proved that Rickettsias of the type of rocha limae have nothing to do with trachoma. The transmission of "Rickettsia-like bodies" recently achieved by Cuénod and Nataf from louse to louse or from louse to man and monkey seems to indicate that these bodies, whatever name they should bear in the nomenclature, are indeed trachoma agents (THE JOURNAL, November 25, p. 1977).

BERLIN

(From Our Regular Correspondent)

Nov. 4, 1939.

Strangulation of Intellectualism

The "scientific academies of the national socialist alliance of German university instructors" constitute the chief weapon which the national socialist party has created to transform the universities. The three existing academies of this kind, in Göttingen, Kiel and Tübingen, recently held their annual session in Munich, "capital of the movement," as it is now officially designated. Dr. Schultze, its leader, who was previously unknown, declared that "the alliance is the appointed trustee of the national socialist party at the universities to see that universities and scholarship are not only painted brown but really made over to fit the pattern of national socialism." In the official opening address of the Bavarian government, the demand was made that "scholarship should serve life and that the national socialist party was today's life. Whatever stood aloof from it was doomed to die and be destroyed, even if still arrayed in ostentatious garments." Schultze had also this to say: that the present struggle of scholarship was to liquidate the ideas of a defunct past generation that had corrupted German thinking. All dominant ideas of the past, medieval dogmatic theology as well as the rationalism of the Enlightenment, had one thing in common; namely, they were of foreign origin. In the middle ages the Germans had learned to feel fear; the Enlightenment, on the other hand, had merely supplied the new ideas of equality and freedom, the former contrary to nature, the latter knowing no restraint. German scholarship, he said, had failed the people because it had emphasized objectivity so much that race, life, country and "weltanschauung" had been lost sight of. The German uni-

versity of the last years was not to be compared with that of former years. He concluded with the statement that "German scholarship and German universities would become either thoroughly national socialist or cease to exist."

Another glimpse into how German cultural life is molded and reconstructed to serve Nazi purposes can be caught from Goebbels's remarks in keeping with his recent utterances on the "intellectuals." He delivered a speech in Berlin's palace of sports on the occasion of a district student gathering, in which he discussed the relation of the intellectual worker to the people and, in particular, the distinction between intelligence and intellectualism. He inveighed against the intellectualist, meaning, chiefly, university teachers and specialists who did not sufficiently bend the pregnant hinges of their knees to nazism, in whom reason had overgrown character and knowledge had destroyed faith. He called them "strolling scholars of our social life," representing not the upper ten thousand but the lower ten thousand, against whom one had to protect oneself. Perhaps it is, he said, the highest political duty to obey faithfully even when reason and knowledge from the point of view of the individual directs a different course. Of course, many of the older generation would regard this demand as impossible. However, the majority of the German people already possessed this discipline. German students should consider it their great political obligation to help achieve the fulfilment of this ideal. Intellectualism would then die a natural death. It was the duty of every intellectual worker, as of every other German, to obey Hitler. Utterances such as these by men high in the council of the totalitarian party on cultural life and the universities naturally affect also physicians and the pursuit and practice of medicine.

Control of the Use of Alcohol and Tobacco

The fight on alcohol and tobacco has been repeatedly reported in these columns (see THE JOURNAL, August 3, p. 1144). Lack of uniform regulations seems to have made necessary the creation of a "government bureau against the dangers of alcohol and tobacco," the administration of which was assumed by Dr. Conti, government health leader. It takes over the functions discharged previously by the government work union for combating alcoholism and by the organizations associated with it. The new bureau will also deal with the control of opiates and hypnotics. Its activities will include publicity and propaganda, the training of workers, the support of the internal administration of the related bureaus and the systematic organization and guidance of activities in relation to all persons who are ill and endangered. Furthermore, the bureau is to promote the production of sweet cider and all nonalcoholic beverages.

The regulation has been put in force recently in Germany prohibiting, in the advertising of tobacco merchandise and alcoholic beverages, reference in any form or fashion to what might create a public impression that hygienic values were connected with the use of tobacco and alcohol. Smoking is prohibited in government bureaus; similar prohibitions concern the army. Moreover, the head of Berlin's police department has requested automobile drivers to refrain from smoking because it increases traffic hazards. This police order will create criminal negligence for drivers who are involved in a collision while engaged in smoking.

According to official statistics, the consumption of beer increased in 1938 by about 4,250,000 hectoliters (1 hectoliter equals 26.4 U. S. gallons) to a total of 46,940,000 hectoliters, equivalent to a per capita increase from 62.9 to 68.8 liters, and the consumption of brandy by 65,000 hectoliters to a total of 327,000 hectoliters; that is, to 1.21 liters per capita of population. In general the increased buying power on the part of the public was accompanied with increased consumption of stimulants. The use of cigarets rose from 609 to 676 per

capita, that of coffee from 2.1 to 2.3 Kg. A decrease was noticed only in the consumption of wine, after the considerable surplus of the record vintages of 1934 and 1935 had been gradually consumed.

Prophylaxis Against Infection in Children's Homes

New directions have been officially released for the more effective protection of children sent away for recreational purposes. Before children are admitted in recreational homes or in private families they are to be medically examined twice, once about two months, the second from one to two days, before departure. At the same time, active vaccination against diphtheria of all children is recommended, the first about two months, the second a month before departure. Immediately on arrival the children should again be medically examined. All suspected children should be segregated until clarification of the diagnosis. Furthermore, all children are to be examined at least once a week during this vacation sojourn by a physician or a trained assistant for infectious diseases. The same precautionary examinations apply to the personnel of the homes and must be performed once every four weeks.

Students Conscripted into Harvest Fields

German students had to work in the harvest fields this year. The universities shortened the summer semester to enable the harvesting for the benefit of the eastern section of the country. The work period lasted from four to six weeks. All students had to serve no matter in what semester they were enrolled or for what course of studies they were registered. The only exemption allowed was the need of urgent preparations for an examination or some similar necessity. As Dr. Scheel, student leader for the reich, declared in his proclamation, it was the duty of German students to help secure their daily bread and make secure their frontiers and to feel enthusiasm for the fuhrer and the German people. Every student was furnished with a work certificate, which he had to present when enrolling for the winter semester. Female students had to assist farm women or conduct harvest kindergartens for young children of peasants in the day time, while their parents were at work. At the end of July, 46,000 students were engaged in eastern Germany in agricultural or harvest work. They were protected by sufficient insurance against sickness and accidents.

Statistics of the Sick Funds

At the suggestion of the reich's public health department, a uniform system of voluntary statistics has been organized for the sick funds. The statistical department of the reich has just published the first results covering the year 1937. Eighty-seven sick funds, with a membership of 4,380,000, reported 1,090,000 male and 680,000 female illnesses. Exclusive of accidents and injuries caused by external agencies, the diseases of men that involved inability to work and loss of working days appeared in the following frequency: influenza 9.1 per cent, muscular rheumatism 5.1 per cent, bronchitis 4.4 per cent, furuncles, abscesses and so on 3.8 per cent, gastric diseases exclusive of ulcers 3.6 per cent, gastric and duodenal ulcers 3.4 per cent, organic cardiac diseases 3.2 per cent. Influenza, accounting also in the case of women for the greatest loss of working days, is represented by 9.6 per cent. Next in order are tonsillitis, pharyngitis and kindred inflammations with 4.5 per cent, organic cardiac diseases with 3.8 per cent, bronchitis with 3.5 per cent and neurasthenia and neuroses with 3.4 per cent.

Medical Training and Appointments

As reported in THE JOURNAL April 8, page 1401, a new medical curriculum has been decreed. Corresponding regulations governing appointments have now likewise been issued. Medical education has been reduced from eleven to ten semesters. The so-called practical year, which one had to serve after com-

pleting the final examinations in order to secure an appointment, has been abolished, effective April 1, 1940. The training course is now organized as follows: It begins with a course of six months attending and nursing patients before beginning university studies. The purpose is to eliminate the unfit. Pre-clinical studies follow in order and continue through four semesters. Successful completion is evidenced in preliminary examinations covering zoology, botany, chemistry, physics, anatomy and physiology. During the vacation periods of the two years the student must work six weeks either in a factory or on a farm. Clinical studies last six semesters. During the vacations, medical students are required to serve twice for three months each as hospital attendants. Provisions have been made so that students may take the state examination within four weeks (formerly it occasionally took six months). On passing the state examination, one is at once granted an appointment. The right to private practice is not allowed, however, until the young physician has served an obligatory year of internship in a hospital and a fourth of a year as assistant or substitute of a sick physician with a rural practice. Students unable to bear arms and female medical students must serve in the German Red Cross or do health welfare work in connection with the Hitler youth movement.

Organization of Committee to Combat Rheumatism

Professor Reiter, president of the public health department of the reich, has organized a committee of specialists to plan measures for protection against rheumatic diseases. Special attention is to be given to the early treatment and timely care of rheumatic persons. It is planned gradually to create effective organizations throughout the nation.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 8, 1939.

Control of the Flying Doctor Service

The Australian Inland Mission Board of the Presbyterian church recently handed over control of the "flying doctor" services at Cloncurry (Queensland) to the Australian Aerial Medical Services. Queensland is the last of the states to register an association not for profit to form a link in a chain of aerial medical services conducted by this organization throughout Australia. The "flying doctor" scheme, as developed originally by the Australian Inland Mission at Cloncurry, is now well established as the most efficient way in which our "outback" settlers may be brought within reach of medical aid. Its development will stand for all time as a monument to Rev. John Flynn, whose dream it was. He realized the terrible isolation when illness or accident overtakes these people. He was familiar with the tragic stories of infants who had died in their mothers' arms on the heart breaking journey of hundreds of miles to the nearest doctor; of the men who, gravely injured in the course of their work, were faced with death where they lay from lack of skilled attention or being killed by the awful journey to a hospital over rough bush tracks. He realized how men shrank from the risk of taking a wife and children out there, with the result that much of our outback is inhabited by men alone. Without the influence of white women and children there seems inevitably to be a decline in those cultural and moral standards which are essential to satisfactory permanent settlement of our back country.

Mr. Flynn's inspiration to use an airplane as a means of transport and wireless as a means of communication between these outback people and their doctor is well known. The amazing thing about it is the clarity of that inspiration, conceived at a time (about 1912) when airplanes were unreliable and unsafe and wireless sets—especially transmitters—were hopelessly expensive and intricate. The airplane was improved

by commercial enterprise, and after years of experiment the wireless problem yielded to the genius of Alfred Traeger, encouraged and supported by Mr. Flynn and the Australian Inland Mission. At last in May 1928 the first aerial medical service base at Cloncurry, was formed. Since that time the Cloncurry base has gone forward steadily, meeting and conquering its difficulties as they arose and building up a tradition of service which holds the admiration of all who know it. It was found that the Cloncurry base could efficiently cover an area of 400 miles radius, that is, an area almost as large as New South Wales. So vast, however, is the sparsely settled part of Australia that there still remained thousands of isolated settlers far beyond the range of the mantle of safety spread by that base. It was obvious that at least six bases would be necessary to serve the whole of Australia's frontiers. A larger organization of national character was therefore formed to undertake the establishment of these bases. It was christened "Australian Aerial Medical Services." Under its auspices other bases have come into being and much valuable work has already been done in those areas.

The heart of an aerial medical service base is the mother radio station, situated close to the flying doctor's home. These stations are fairly powerful and send out excellent signals in voice so that the outback people listen to it just as easily as one does to a broadcast program. Scattered round the mother station are numerous pedal sets, the ingenious "transceivers" invented and built by Mr. Traeger. These small stations derive their main power from a generator driven by bicycle pedals and with them the owners are able to send clear signals in voice from distances of 700 miles and more. They have in reserve a remarkable instrument called an automatic transmitting keyboard for sending Morse code when atmospheric conditions are not suitable for voice. They are all thus kept in constant communication with the mother station and the doctor. Constantly at the disposal of the doctor is an airplane especially adapted to carry a patient on a stretcher in the cabin. The ambulance plane also carries wireless and so keeps the doctor in touch with his base and the rest of his large "practice" while he is out on a flight.

Several avenues of service are available with such organization: 1. Detailed advice as to treatment not only sets anxious hearts at rest in cases of minor illness but, when applied early, often prevents a major illness from developing. 2. A prompt call to the doctor, early diagnosis and quick, comfortable transport to a hospital, where efficient treatment can be given, are saving several lives each year in each of the areas now covered by the Aerial Medical Service. 3. Not the least valuable of these avenues involves no active work at all. The very presence in the district of the Aerial Medical Service base, able and willing to help in time of need, brings the outback people a sense of security hitherto unknown to them. 4. Wireless has broken down the isolation of the bush. Lonely women who do not see another white woman for months at a time can now converse in voice with their next door neighbor a hundred miles away. The receivers are used to receive broadcast programs and bring the news of the world to the most remote homes in the continent.

The Aerial Medical Service is rapidly developing in the back country a network of efficient communication and aerial transport facilities, such as landing ground and gasoline supplies—an interesting by-product of the purely medical work which is its mainspring.

Hydatid Disease in New Zealand

For nearly fifty years Sir Louis Barnett, emeritus professor of surgery, University of Otago, and chairman of the New Zealand Hydatid Research Committee, has concerned himself with an investigation of the high prevalence of hydatid disease in New Zealand. Now he has published in the *New Zealand*

Medical Journal a further report on the incidence of the disease and the progress of the prevention campaign. The figures for 1938 are slightly better than those for 1937, but it is not yet permissible to claim a definite diminution of hydatid incidence in New Zealand. Last year the Hydatid Registry recorded a total of 1,304 cases with 151 deaths in a population of 1,604,244. In 787 cases the site of the cysts was the liver, and in 260 the lungs were involved. The prevalence of hydatid cysts in farm animals, as shown by abattoir tables and field research observations, continues at an alarming height. In New Zealand there are approximately 31 million sheep and 4¼ million cattle. Barnett claims that more than half of those reaching adult life have their livers and lungs studded with cysts either of *Echinococcus* or *Tenuicollis* type or both. The prevalence of the adult hydatid worm (*Taenia echinococcus*) in the dog is also considered very high.

The prevention campaign has been intensified during the year, and notable advances have been made in the lecturettes, films, models and specimen demonstrations at most of the Agricultural Shows and at other suitable gatherings. Another move that has this year focused the attention of dog owners on the subject of hydatid disease, its prevalence and ill effects and its possible prevention, is the distribution by the government to all dog owners in the dominion, on the occasion of dog registration, of a supply of arecaline vermifuge tablets, which can be depended on, if properly used, to eradicate not only the hydatid parasite but also sundry other worms to which dogs are prone.

Reports on the results of this action have been almost universally favorable but, as was only to be expected, there have been adverse comments receiving much attention in the press. These allegations, although unwarranted, have increased the number of dog owners who refuse or neglect to dose their dogs. At present they are under no legal obligation to do so; but the Hydatid Research Committee strongly urges that the two absolutely essential procedures in the campaign of hydatid eradication should be made compulsory by law. These procedures are (1) the regular administration of an approved vermifuge to all dogs and (2) the prohibition against the feeding of dogs on the raw livers and lungs of sheep and cattle.

Through the medium of the Hydatid Registry of the Royal Australasian College of Surgeons, clinical research on the problem of hyatids in Australia and New Zealand is also making headway, and with helpful cooperation from the community it should soon be possible to have the disease under efficient control.

Marriages

EUGENE AMOS HOLLAND to Miss Mary Frances White, both of Fairmont, W. Va., at Hot Springs National Park, Ark., August 17.

JOHN WILLIAM DIDCOCK, Shelbyville, Tenn., to Miss Joy Carrier at Mortons Gap, Ky., October 7.

SAMUEL EUGENE FIELD, Centreville, Miss., to Miss Mildred Elizabeth Ruoff of Jackson, October 27.

MICHAEL D. MASSENGILL JR. to Miss Mary Linda Rector, both of Kingsport, Tenn., October 8.

BEN BESHOR, Trinidad, Colo., to Mrs. Olive Waldrip of Los Angeles at Raton, N. M., October 3.

CARL FREDERICK NEUHOFF to Miss Hazel Louise Davenport, both of Peoria, Ill., October 14.

JULIA S. MEHLMAN to Maj. Frederick W. Greenhut, both of New York, November 11.

WIXOM S. SIBLEY to Miss Katherine Pickett, both of San Francisco, November 9.

NATHAN J. DAVIDOV to Miss Elsie Zerwitz, both of Baltimore, September 27.

JOHN R. MOODY to Miss Kathaleen Daniels, both of Erwin, Tenn., October 14.

Deaths

Charles Clifton Browning, San Marino, Calif.; University of Missouri School of Medicine, Columbia, 1883; member of the California Medical Association; professor emeritus (tuberculosis) at the College of Medical Evangelists, Loma Linda; fellow of the American College of Physicians; for many years a director of the National Tuberculosis Association; member of the American Clinical and Climatological Association; past president of the California Tuberculosis Association and the Los Angeles County Medical Association; served during the World War; formerly chief of the staff of the tuberculosis service, Los Angeles County Hospital; aged 78; died, September 28, of pneumonia.

Ashley Walker Morse Ⓢ Butte, Mont.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the American Academy of Ophthalmology and Otolaryngology, American Laryngological, Rhinological and Otolological Society and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; for many years secretary of the Montana Academy of Oto-Ophthalmology; past president of the Silver Bow County Medical Society; consultant to St. James Hospital; aged 56; died, October 12, at Lansing, Mich., of pneumonia.

David Baker Ⓢ Colonel, U. S. Army, retired, Waltonville, Ill.; Barnes Medical College, St. Louis, 1893; fellow of the American College of Surgeons; veteran of the Spanish-American War; was commissioned an assistant surgeon in 1898, a captain in the medical corps of the U. S. Army in 1903 and rose through the various ranks to that of colonel in 1917; retired in 1935 by operation of law; aged 68; died, September 8, at Fort Sam Houston, Texas.

Jacob Usry Ray, Woodstock, Ala.; University of Tennessee Medical Department, Nashville, Tenn., 1893; member of the Medical Association of the State of Alabama and formerly treasurer; for many years secretary of the Alabama Association of Railroad and Industrial Surgeons; at one time postmaster; past president of the Bibb County Medical Society; aged 75; died, October 5, of myocarditis, arteriosclerosis and hypertension.

Howard Brownlee Hamilton Ⓢ Omaha; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; professor emeritus of pediatrics at the University of Nebraska College of Medicine; past president of Omaha-Douglas County Medical Society; member of the American Academy of Pediatrics; aged 64; died, October 12, of bilateral bronchopneumonia.

Bayard G. Keeney Ⓢ Shelbyville, Ind.; Medical College of Ohio, Cincinnati, 1902; fellow of the American College of Physicians; past president and secretary of the Shelby County Medical Society; health officer; for many years member of the city board of education; aged 63; died, October 11, at Fort Wayne of coronary occlusion while attending the state medical meeting.

Francis Washington Sovak Ⓢ New York; University and Bellevue Hospital Medical College, New York, 1911; clinical professor of obstetrics and gynecology at his alma mater; fellow of the American College of Surgeons; on the staffs of the Bellevue Hospital and the Misericordia Hospital; aged 54; died, October 27, in the Midtown Hospital.

Archibald Ray Knode Ⓢ Omaha; University of Nebraska College of Medicine, Omaha, 1904; formerly associate professor in the department of otorhinolaryngology at his alma mater; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the Immanuel Hospital; aged 57; died, October 11, of coronary thrombosis.

George Joseph Waggoner Ⓢ Ravenna, Ohio; University of the City of New York Medical Department, 1890; past president and secretary of the Portage County Medical Society; formerly member of the city board of health; on the staff of the Robinson Memorial Hospital; aged 74; died, October 7, of pulmonary thrombosis.

Wilbert Arthur Hobbs Ⓢ East Liverpool, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; fellow of the American College of Surgeons; Spanish-American War veteran; aged 77; on the staff of the East Liverpool City Hospital, where he died, October 17, of cerebral hemorrhage.

Austin Funk Ⓢ Jeffersonville, Ind.; University of Louisville (Ky.) Medical Department, 1900; served during the World War; formerly secretary of the Clark County Medical

Society; aged 65; died, October 24, in the Clark County Memorial Hospital of skull fracture received in an automobile accident.

Oscar Brunk Funkhouser Ⓢ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; Northwestern University Medical School, Chicago, 1909; aged 53; died, October 17, in the Washington Boulevard Hospital of mitral insufficiency.

Robert H. Trimble, Mount Sterling, Ohio; Starling Medical College, Columbus, 1894; member of the Ohio State Medical Association; county health officer; formerly mayor; past president of the school board; aged 69; died, October 18, in the Grant Hospital, Columbus, of carcinomatosis.

Fred Lawwill Rhodes, Massillon, Ohio; Ohio State University College of Medicine, 1916; served during the World War; formerly on the staff of the Massillon State Hospital; aged 49; died, October 10, in the White Cross Hospital, Columbus, of obstruction of the esophagus.

Harry Obadiah Knight Ⓢ Galveston, Texas; University of Texas School of Medicine, Galveston, 1907; member of the American Association of Anatomists; professor of anatomy at his alma mater; aged 58; died, October 5, in the John Sealy Hospital of a self-inflicted bullet wound.

Charles Edward Miller, Muncie, Ind.; Miami Medical College, Cincinnati, 1898; member of the Indiana State Medical Association; past president of the Delaware-Blackford Counties Medical Society; aged 69; died, October 17, of bronchopneumonia and heart disease.

Ralph Edgar Weller, Electra, Texas; University Medical College of Kansas City, Mo., 1904; member of the State Medical Association of Texas; fellow of the American College of Surgeons; served during the World War; aged 67; died, October 12, of cerebral hemorrhage.

Eugene Carl Roemele, Frankfort, Ky.; Hospital College of Medicine, Louisville, 1897; member of the Kentucky State Medical Association; county health officer; at one time medical director of the State Reformatory; aged 62; died, October 14, of angina pectoris.

James Buchanan Lightfoot, Miami, Okla.; Memphis (Tenn.) Hospital Medical College, 1905; member of the Oklahoma State Medical Association; aged 75; died, October 5, in the Miami Baptist Hospital of arthritis following an injury received in a fall.

Eugene Frederick Hauck, Clayton, Mo.; St. Louis Medical College, 1880; member of the Missouri State Medical Association; for many years medical director of St. Louis Mutual Life Insurance Company; aged 82; died, October 8, of pyelitis and heart disease.

Jacob John Minke, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; served during the World War; physician in chief to the Oak Forest (Ill.) County Infirmary; aged 56; died, October 1.

George Elias Boulos, Hazard, Ky.; University of Louisville (Ky.) School of Medicine, 1927; on the staff of the Hurst-Snyder Hospital; aged 36; was found dead, October 20, at his office in Louisville of illuminating gas poisoning, self administered.

Edwin Merville Bennett, Paris, Ill.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; member of the Illinois State Medical Society; served during the World War; aged 72; died, October 14, of coronary thrombosis.

Reuben Harrison Mast Ⓢ Myrtle Point, Ore.; University of Oregon Medical School, Portland, 1924; medical director of the Mast and Wilson Hospital; aged 44; died, October 8, as a result of an accidental fall from a hotel window in Portland.

Granville E. Dickinson Ⓢ Upper Fairmount, Md.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; an Affiliate Fellow of the American Medical Association; aged 87; died, October 14, of acute dilatation of the heart.

Moza West Hurt, Mayfield, Ky.; University of Louisville (Ky.) Medical Department, 1911; member of the Kentucky State Medical Association; on the staff of the Mayfield Hospital; aged 54; died, October 6, of cerebral embolism.

John Jacob Kirschenmann Ⓢ Brooklyn; Long Island College Hospital, Brooklyn, 1924; on the staff of the Norwegian Lutheran Deaconess Home and Hospital; aged 40; died, October 5, in Phoenix, Ariz., of tuberculosis of the lungs.

Carlyle Walter Dewey, Conneaut, Ohio; Cleveland Homeopathic Medical College, 1910; city health officer; member of the state medical board; formerly county coroner and member of the board of education; aged 58; died, October 22.

William Walter Wyatt, Peoria, Ill.; Illinois Medical College, Chicago, 1903; member of the Illinois State Medical Society; served the Methodist Hospital in various capacities; aged 74; died, October 22, of coronary thrombosis.

Willis Dowd Gilmore, Phoenix, Ariz.; University of North Carolina School of Medicine, 1903; tuberculosis consultant for the state board of health; aged 61; died, October 19, in Ann Arbor, Mich., of heart disease.

Frederick Philip Mann, Valley Falls, Kan.; St. Louis University School of Medicine, 1904; served during the World War; on the staff of St. Francis Hospital, Topeka; aged 61; died, October 16, of cerebral hemorrhage.

James M. Erwin, Calhoun, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1898; member of the Medical Association of Georgia; aged 75; died, October 19, of injuries received when struck by an automobile.

Albert J. Howell, Bay Port, Mich.; Detroit College of Medicine, 1896; member of the Michigan State Medical Society; aged 70; died, October 7, in the Hubbard Memorial Hospital, Bad Axe, of angina pectoris.

Arthur P. Shearburn, Walnut, Ill.; Chicago Homeopathic Medical College, 1893; member of the school board and formerly mayor; aged 77; died, October 8, in the Julia Rackley Perry Memorial Hospital, Princeton.

Franklin Fletcher Dunham, Winnipeg, Man., Canada; Manitoba Medical College, Winnipeg, 1913; aged 52; died, October 31, at the Deer Lodge (Man.) Hospital of coronary thrombosis and chronic pericarditis.

Francis Marion Sanders, Herrin, Ill.; St. Louis College of Physicians and Surgeons, 1904; member of the Illinois State Medical Society; was a member of the school board; aged 72; died, October 19, of heart disease.

James Wilson Cowart, Walden, Ga.; Tulane University of Louisiana School of Medicine, New Orleans, 1894; member of the Medical Association of Georgia; aged 69; died, October 11, of aplastic anemia.

Perry Oliver Englerth, North Judson, Ind.; Kentucky School of Medicine, Louisville, 1896; member of the Indiana State Medical Association; aged 65; died, October 25, of coronary thrombosis.

Adolph O. Speckhard, Bay City, Mich.; Fort Wayne College of Medicine, 1896; member of the Michigan State Medical Society; aged 75; died, October 19, of benign hypertrophy of the prostate.

William Orlando Durham, Moxeys, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893; aged 70; died, October 5, of cerebral thrombosis, arteriosclerosis and hypertension.

Johanna Baptistella Leo, New York; Woman's Medical College of Pennsylvania, Philadelphia, 1897; member of the Medical Society of the State of New York; aged 75; died, October 20.

William F. Cleveland, Evansville, Ind.; Kentucky School of Medicine, Louisville, 1892; member of the Indiana State Medical Association; formerly state senator; aged 83; died, October 10.

Harry Alonzo Lewis, Continental, Ohio; Toledo Medical College, 1896; member of the Ohio State Medical Association; formerly mayor; aged 80; died, October 7, of coronary thrombosis.

Robert Brown, San Francisco; College of Physicians and Surgeons of San Francisco, 1911; aged 61; died, September 13, in St. Francis Hospital of coronary occlusion and arteriosclerosis.

William Stanley Reilly, Joliet, Ill.; St. Louis University School of Medicine, 1917; served during the World War; aged 47; died, September 26, in the Veterans Administration Facility, Hines.

Charles T. Granger, Rochester, Minn.; Hahnemann Medical College and Hospital, Chicago, 1892; aged 69; died, October 4, of cardiac decompensation, arteriosclerosis and bronchopneumonia.

Anton Philip Freund, Chicago; Bennett Medical College, Chicago, 1911; served in the U. S. Public Health Service; on the staff of the American Hospital; aged 76; died, October 15.

Guy Watts Wagner, Chicago; Northwestern University Medical School, Chicago, 1899; served during the World War; on the staff of the Henrotin Hospital; aged 65; died, October 7.

Philip Berry Thomas, Decatur, Ind.; Chicago Medical College, 1885; for many years secretary of the city board of health; aged 79; died, September 20, of cerebral hemorrhage.

Arthur Miller Northrup, Wilkes-Barre, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; aged 61; died, October 3, in the Pembroke (Ont.) Hospital.

Harry J. Phillips, Louisville, Ky.; University of Louisville Medical Department, 1893; aged 67; died, October 10, in the Kentucky Baptist Hospital of a streptococcal infection.

Oliver P. Morton Ford, Centerville, Ind.; Medical College of Ohio, Cincinnati, 1889; aged 75; died, October 25, in the Reid Memorial Hospital, Richmond, of heart disease.

Louis I. Melnick, Los Angeles; University of Vermont College of Medicine, Burlington, 1919; aged 53; died, September 12, of coronary occlusion and chronic myocarditis.

Frances Pearl Frank Zumwalt, Tulare, Calif.; College of Physicians and Surgeons, Los Angeles, 1917; aged 45; died, September 13, of metastatic carcinomatosis.

Clarence Gilliam Reno, Summit, Ky.; University of Louisville (Ky.) Medical Department, 1897; served during the World War; aged 66; died, October 5.

William Duff Forrest, Halifax, N. S., Canada; Halifax Medical College, 1898; L.R.C.P., London, and M.R.C.S., England, 1901; died, September 12.

Wyllis A. Silliman, Alameda, Calif.; University of the City of New York Medical Department, 1886; aged 81; died recently of asphyxiation due to submersion.

Charles Edward Jeffery, Lincoln, Mich.; Trinity Medical College, Toronto, Ont., Canada, 1895; aged 68; died, October 18, in Woodbridge, Ont., Canada.

Drury Leigh Fish, Phoenix, Ariz.; St. Louis University School of Medicine, 1909; aged 53; died, October 8, of myocarditis and intestinal obstruction.

Frank L. Herman, Conover, N. C.; Louisville (Ky.) Medical College, 1892; aged 79; died, October 28, of coronary thrombosis and arteriosclerosis.

Frank Russell Morgan, Los Angeles; Hahnemann Medical College and Hospital, Chicago, 1905; aged 60; died, September 13, of angina pectoris.

Fred Buxton Larimore, New Philadelphia, Ohio; Starling Medical College, Columbus, 1903; aged 61; died, October 15, of pulmonary tuberculosis.

Aaron Bockar, Brooklyn; Illinois Medical College, Chicago, 1899; aged 65; died, September 28, in the Crown Heights Hospital of hemiplegia.

Lionel John Samuel Sicard, Buckingham, Que., Canada; McGill University Faculty of Medicine, Montreal, 1919; aged 44; died, September 21.

Frank Galbraith Leslie, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1899; aged 65; was shot and killed, September 15.

John Francis Macaulay, Castalia, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1898; aged 62; died, September 17.

Edward Francis McCormack, Flushing, N. Y.; Albany Medical College, 1897; died, August 30, of bronchopneumonia and arteriosclerosis.

Allie Hunter Stowe, Pacolet, S. C.; North Carolina Medical College, Charlotte, 1912; aged 58; died, September 10, of coronary occlusion.

John A. Ritter, West Baden Springs, Ind.; University of Louisville (Ky.) Medical Department, 1874; died, October 19, of paraplegia.

Bernard Oliver Amberson, Chicago; Rush Medical College, Chicago, 1929; aged 37; died, October 18, at Manteno, Ill.

William M. Moore, Pine Bluff, Ark.; Meharry Medical College, Nashville, Tenn., 1905; aged 56; died, September 15.

W. K. Burnett, Winston, Ga.; Chattanooga (Tenn.) Medical College, 1894; aged 70; died, September 19, of myocarditis.

Henry M. Mugg, Clarks Hill, Ind.; Medical College of Indiana, Indianapolis, 1902; aged 64; died, September 17.

Frank Rudolph Coursey, Boston; Tufts College Medical School, Boston, 1912; aged 52; died, September 11.

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Cannon's Salve.—Dr. J. Cannon Salve Co., Ltd., Petoskey, Mich. Composition: Essentially a lead compound in a fatty base. For frozen feet, eczema, mad dog bite, blood poison, boils, etc. Fraudulent therapeutic claims.—[N. J. 29774; March 1939.]

Dodd's New Discovery.—Stotts Medicine Co., West Memphis, Ark. Composition: Essentially water, sugar, alcohol, chloroform, oil of sassafras and menthol. Fraudulently represented as a cure for pneumonia, asthma, tuberculosis, and other lung and bronchial troubles.—[N. J. 29771; March 1939.]

Hauser Potassium Broth.—Modern Health Products, Inc., Milwaukee. Composition: Essentially ground dried plant materials including peas, carrot, onion, celery and alfalfa, with common salt. Misbranded because played up as a health product and because falsely represented to be a potassium preparation and a highly concentrated alkaline broth. Fraudulent therapeutic claims.—[N. J. 29765; March 1939.]

[An earlier Notice of Judgment (26484, May 1937) charging similarly fraudulent claims made for this and the two foregoing products was the subject of an extended article in the Bureau of Investigation Department of THE JOURNAL, June 19, 1937, p. 2155.]

Lal Tablets No. 2.—Lal Pharmacal Co., New York. Composition: Essentially acetophenetidin (about 2 grains per tablet), aspirin and caffeine. Misbranded because presence and amount of acetophenetidin were not declared and because the product was fraudulently represented as a remedy for la grippe.—[N. J. 29754; March 1939.]

Norwesco Rub.—McKesson & Robbins, Blumauer-Frank Division, Portland, Ore. Composition: A grease containing oil of eucalyptus. Fraudulently represented as efficacious in surface inflammations, croup, coughs, deep chest colds and incipient pneumonia.—[N. J. 29762; March 1939.]

Millertone.—J. S. Miller, Inc., New Jersey (town not given). Composition: Essentially ground senna leaves with small amounts of other plant material, including possibly buckthorn bark and gentian root. Fraudulently represented as virtually a cure-all.—[N. J. 29787; March 1939.]

Parlogen Tablets.—American Drug & Chemical Co., Minneapolis. Composition: Rochelle salt, starch and a small amount of a chlorine-liberating compound. Fraudulently represented as having antiseptic and germicidal action in "feminine hygiene."—[N. J. 29763; March 1939.]

[San-Tox] **Nurse Brand Blackberry Root and Ginger Compound.**—De Pree Co., Holland, Mich. Composition: Essentially extracts of plant material (including ginger), and a small amount of volatile oils (including cloves and nutmeg) with alcohol and water. Fraudulently represented as a cure for relaxed conditions of the bowels.—[N. J. 29793; March 1939.]

[San-Tox] **Nurse Brand Boil Salve.**—De Pree Co., Holland, Mich. Composition: Essentially zinc oxide and a small amount of carbolic acid in a specially prepared base. Fraudulently represented as effective in aborting incipient boils.—[N. J. 29795; March 1939.]

San-Tox Nurse Brand Flaxseed.—De Pree Co., Holland, Mich. Composition: Ordinary flaxseed. Fraudulently represented as a relief for habitual constipation and a cure for catarrh, dysentery and other inflammatory disorders of mucous membranes of lungs, intestines and urinary tract.—[N. J. 29793; March 1939.]

San-Tox Nurse Ground Catnip Herb.—De Pree Co., Holland, Mich. Composition: Common catnip. Fraudulently represented as a cure for colic in children and as an emmenagogue.—[N. J. 29793; March 1939.]

San-Tox Nurse Brand Pennyroyal.—De Pree Co., Holland, Mich. Composition: Chiefly leaf fragments, seeds and seed pods of pennyroyal, contaminated with a large amount of rodent excreta. Adulterated because not composed of dried leaves and flowering tops of pennyroyal and misbranded because the term "Pennyroyal" was false and misleading.—[N. J. 29793; March 1939.]

San-Tox Nurse Brand Sage Leaves.—De Pree Co., Holland, Mich. Composition: Common sage leaves. Fraudulently represented as a tonic and as an aid in the treatment of malaria, excessive sweats and rheumatic fevers.—[N. J. 29793; March 1939.]

[San-Tox] **Nurse Brand Sarsaparilla Compound.**—De Pree Co., Holland, Mich. Composition: Essentially potassium iodide, extracts of plant drugs (including a laxative), alcohol, sugar and water. Fraudulently represented as a blood purifier.—[N. J. 29793; March 1939.]

San-Tox Stomach Bitters.—De Pree Co., Holland, Mich. Composition: Essentially extracts of plant drugs (including an alkaloid-bearing drug), sugar and water. Fraudulently represented to increase the number of white blood cells, correct loss of appetite, incomplete digestion, dyspepsia, etc.—[N. J. 29793; March 1939.]

Soap Lake Salts.—Soap Lake Products Corp., Seattle. Composition: Essentially common salt, washing soda, Glauber's salt and a small amount of potassium chloride. Representations as to its efficacy in treating rheumatism, eczema, pyorrhea, gangrene, etc., were declared fraudulent.—[N. J. 29755; March 1939.]

Vitatonie.—Edward Hidden, New York. Composition: Essentially extracts of plant drugs including nux vomica and a laxative drug, alcohol (34.4 per cent by volume) and water. Fraudulently represented as a "body builder" and a remedy for kidney, liver and stomach disorders.—[N. J. 29764; March 1939.]

ROBINSON'S PERNICIOUS ANEMIA CURE

The Mails Are Closed to a Dangerous Fraud

More than fourteen years ago the Bureau of Investigation looked into a dangerous fake exploited by one W. A. Robinson, of Sisseton, S. D. Following the investigation the facts were given to the medical profession and the public through an article published in this department of THE JOURNAL and later reproduced in a condensed form in "Nostrums and Quackery and Pseudo-Medicine," Volume III, published by the American Medical Association. The condensed report from the book follows:

Robinson's Pernicious Anemia Cure.—From Sisseton, S. D., one W. A. Robinson exploited an alleged cure for pernicious anemia. Original letters written by Robinson indicated that he was a man without any general education and was obviously ignorant of medicine. Robinson's story was to the effect that in 1919 he had what the physicians had diagnosed as pernicious anemia and was told that it was unlikely that he would get well. He then set about it to find a cure for his condition and this he claimed to have done. Robinson's theory of the etiology of pernicious anemia was not new; it was to the effect that the condition is caused by intestinal parasites. He called these parasites "Anemias" and declared that pernicious anemia "is not a disease at all, any more than 'cooties' is a disease." Robinson claimed that he kept up his "research" on the cause and cure of pernicious anemia for nearly seven months (!) and then found both the cause and the cure; that he cured himself and two friends before he began putting the thing on the market. Robinson charged \$30 for his treatment, which he claimed would entirely remove the cause of pernicious anemia in twenty-five days. The treatment consisted of two parts; one was coarse, sharp sand and the other was sometimes a green colored liquid and sometimes some "liver pills." One patient suffering from pernicious anemia took Robinson's nostrum and the sand caused hemorrhages, resulting in the patient's death. Another victim also died following the use of Robinson's treatment and his physician wrote that the end was hastened by the gastric disturbances induced by the treatment.—(Condensed from The Journal A. M. A., Oct. 24, 1925.)

The original article was published in THE JOURNAL Oct. 24, 1925. In 1928 the Post Office Department called on Robinson to show cause why a fraud order should not be issued against

PERSONAL

PERNICIOUS ANEMIA

need no longer be a FATAL disease. After 7 months research every day I found the CAUSE and CURE. I can positively remove the cause in 10 days. If the cause is removed they can get well. If not removed, NEVER. W. A. ROBINSON, SISSETON, S. D.

One of Robinson's old advertisements.

him. In order to escape having the mails closed to him, Robinson on June 14, 1928, executed and filed with the Post Office Department in Washington an affidavit in which he swore that he had "absolutely discontinued" his business of selling an alleged cure for pernicious anemia and he promised that the business would "not be resumed at any time in the future." But in 1936 Robinson was again advertising his "cure." The Post Office Department once more intervened and finally on March 22, 1939, a fraud order was issued against W. A. Robinson, of Sisseton, S. D., closing the mails both to the fraud and to the quack who had conducted it.

Correspondence

INTESTINAL OBSTRUCTION AFTER COLLOIDAL ALUMINUM HYDROXIDE

To the Editor:—In THE JOURNAL October 21, page 1564, appears the report of a case of intestinal obstruction supposedly caused by colloidal aluminum hydroxide. There is much additional information to be desired to that contained in this report. First, what was the diet of the patient while she was receiving the continuous intragastric drip of aluminum hydroxide? From the author's description the material found to be obstructing the small bowel would seem as likely to have been composed of milk curds as anything else. If the patient was largely on a milk diet and the milk was unmodified by the addition of lactose and sodium citrate the formation of curds could be expected. Secondly, if it was to be proved that the aluminum hydroxide caused the obstruction why not present a chemical analysis of the obstructing material? These are two points which need further elucidation by the author.

It has been my practice in a not inconsiderable number of cases of ulcer, with and without hemorrhage, to use a more dilute solution of aluminum hydroxide, mixing three parts of water with one part of the drug and giving it at the rate of 1,500 cc. every twenty-four hours, at the same time allowing a rather liberal soft diet.

The constipating effect of aluminum hydroxide has not been shrouded, as the author contends. In sixty-seven recorded cases and many unrecorded cases in which I have used this preparation I have yet to see constipation develop which is not readily alleviated by the proper use of liquid petrolatum.

CLEMENT R. JONES JR., M.D., Pittsburgh.

To the Editor:—The report by Dr. W. Paul Havens, in THE JOURNAL October 21, page 1564, of an alleged case of intestinal obstruction caused by colloidal aluminum hydroxide deserves some comment, since the use of this antacid either by mouth or by intragastric drip has become quite extensive.

In the case reported, sickness followed severe hemorrhage and 8 cc. of colloidal aluminum hydroxide was administered every two hours for three and a half days, followed by the constant drip of 2,000 cc. of a 1:2 dilution every twenty-four hours. Liquid petrolatum was used only once, but morphine sulfate 10 mg. was administered every four hours for several days. The specific effect of morphine is to contract sphincters, in this way producing a marked degree of constipation.

The evidence of an actual obstruction of the bowel, however, is not convincing. There was no vomiting and apparently only a moderate degree of gaseous distention of the bowel proximal to the lower third of the ileum. The rectum was reported to be full at autopsy after effective enemas. Obviously the intestinal contents were moving downward. It is a question whether the same conditions would not have been found at autopsy in any case in which morphine had been given over a period of days after the ingestion of any other material including bulky food residue.

An opiate should not be used in connection with the aluminum hydroxide drip treatment except in the occasional case in which there is an atypical reaction of diarrhea. For all others, phenobarbital and novatropine or other sedatives are used liberally and liquid petrolatum in one-half ounce (15 cc.) quantities two or three times a day. With these precautions in a series of 407 cases (101 presenting massive hemorrhage) there has been no instance of intestinal obstruction. In the earlier cases there were many instances of an accidental inflow of a whole flask of the aluminum suspension in a short time owing to an air leak in the siphonage system. There usually was no disturbance of the bowel and never as much difficulty in the elimination of

this excess as in some cases of barium retention after x-ray examination. In some cases there will be firm scybala palpable in the left iliac fossa, but with a more liberal use of liquid petrolatum by mouth, an occasional oil enema and the avoidance of opiates impactions are prevented.

If one is familiar with the mildly constipating character of aluminum hydroxide and takes the necessary precautions, especially with the drip treatment, there should be no serious difficulty with the matter of constipation or danger of true mechanical obstruction of the bowel. The astringent properties of aluminum hydroxide seem to have certain advantages in the treatment of ulcer, and many patients testify that symptomatic relief is more complete than with magnesium trisilicate, which is sometimes substituted. The combination of the two non-alkalizing antacids is often useful in ambulatory management.

If the whole principle of antacid therapy is sound, certainly the principle of continuous night and day neutralization is sound. X-ray and other evidence indicates that healing may be obtained in as short a period as ten days and in a higher percentage of cases than can be obtained by the older medical managements over a period of three weeks or more. Hence the importance of getting the exact facts about minor difficulties and the technic to avoid them.

V. C. ROWLAND, M.D.

E. E. WOLDMAN, M.D.

Cleveland.

"EXPERIMENTAL CHEMOTHERAPY WITH SULFANILAMIDE AND RELATED COMPOUNDS"

[An addendum to paper in THE JOURNAL November 4].

To the Editor:—An exception to the specificity of the reaction for the detection of oxidation products of aromatic amines (described in *Public Health Reports* 54:1880 [Oct. 20] 1939) has been found in that positive results were obtained with the glucosides of sulfanilamide and 4,4'-diaminodiphenyl sulfone. Apparently this linkage protects the amino group from acetylation, but the glucoside is later split off by the nitrous acid employed in diazotization.

Observations made with the original technic must be interpreted in the light of these observations. Our results on urinary excretion of a hydroxylamine derivative following administration of sulfanilamide must be reexamined to determine to what extent other derivatives were involved in the reaction.

Attempts are being made to modify the procedure so that these difficulties will be overcome.

SANFORD M. ROSENTHAL, M.D., Washington, D. C.
Senior Pharmacologist, U. S. Public Health Service.

ELECTROCARDIOGRAMS

To the Editor:—In the August 12 issue of THE JOURNAL, Drs. Strouse, Katz and Binswanger discussed a feature of electrocardiographic study which is worthy of reemphasis. Textbooks and the literature have not sufficiently stressed the problem and the significance of basic and serial electrocardiograms. By careful study of patients and graphs one finds that the single picture is usually of no clinical value except as it presents definite diagnostic features. Especially is this true in coronary disease on an arteriosclerotic basis, in which progression of the pathologic condition may take place without clinical exhibition of variation in cardiac disorders or even in symptomatology.

It seems that the best way to detect lesions early is by taking the patient's cardiac "fingerprints" and follow these up subsequently; i. e., a routine electrocardiogram of all patients over the age of 40 at the time of a general physical examination. Later follow-ups will help in early diagnosis of the presence or extension of disease by comparative study. It is in coronary

disease that this procedure will have inestimable value and possibly help in preventing early or avoidable cardiac morbidity.

Here is an example of the importance of an early presymptomatic electrocardiogram. It is known that the T wave may be normally inverted in lead 3. But it is not known what the normal is for any individual unless one has his cardiac "finger-prints." A man of 62 with no symptoms had a normal electrocardiogram in the four leads with inverted T₃, which is not considered pathologic. Four months later the first manifestation of posterior infarction was pain in the back, but the electrocardiogram showed an erect T₃, which had been inverted. This was interpreted as a coronary disorder and within two days a typical graph of occlusion was evident. If the "normal" electrocardiogram had not been available, a case of this sort might have been overlooked.

The electrocardiogram, when properly used and interpreted, is an extremely useful adjunct to the history and examination in arriving at a definite diagnosis and prognosis in some cases in which doubt would prevail regarding the management of the case.

Since heart disease has assumed the position of Osler's "Captain of the Men of Death," I feel that this plea for early and serial electrocardiograms should seriously be considered by all doing cardiac work.

SAMUEL WALDMAN, M.D., Brooklyn.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ANGINA PECTORIS, NEUROCIRCULATORY ASTHENIA AND MENOPAUSE

To the Editor:—Two years ago a married Jewish woman 51 years old developed an anginal syndrome parallel with her menopausal syndrome. Only since two months ago has definite evidence of coronary sclerosis been identified by electrocardiograph. She has never had decompensation, but lately some cyanosis of the lips and finger nails has been visible and paroxysmal tachycardia has developed. Since the prognosis is apparently poor and since it is felt that her years are numbered, I wish you could tell me whether the injection of alcohol into the sympathetic and parasympathetic ganglions and nerves of those leading to the heart is rational therapy and what neurosurgeons are capable of performing these injections. Glyceril trinitrate and other vasodilators have been used without success. What other types of therapy may safely be used on this form of heart disease?

Jacob C. Dorfman, M.D., Rochester, N.Y.

ANSWER:—It is most important in the first place to be absolutely certain of the diagnosis of angina pectoris in this patient with the menopause. She is probably in a highly nervous state and one must carefully rule out neurocirculatory asthenia, which will be associated frequently with heartache and anterior chest pain. The very failure of her discomfort to be relieved by glyceryl trinitrate is strong evidence against angina pectoris.

The electrocardiographic evidence of coronary disease does not prove the presence of angina pectoris. She might have either one alone, and many persons with neurocirculatory asthenia have also electrocardiographic evidence of coronary disease without any angina pectoris. There are in this case some evidences of irritability of the heart and circulation not necessarily in keeping with coronary disease, for example cyanosis of the lips and finger nails and paroxysmal tachycardia.

If, however, the most careful consideration indicates the presence of an important and, to a certain extent, a crippling degree of real angina pectoris, radical therapy should be considered. However, it is best to try to postpone it until after the menopause is completed because the clearing of the menopause itself may result in definite improvement and moreover there are many instances of spontaneous recovery from coronary insufficiency. This has been found to be almost the rule. Coronary disease may continue, of course, but the development of collateral coronary circulation renders the state of health much better.

Paravertebral injection of alcohol is, although helpful, to be considered a radical measure and to be postponed until all adequate medical measures, including nitrites, have proved unavailing. It is well to wait a year or two or more before undertaking any radical methods of treatment unless the situation is really bad.

MYOTONIA ACQUISITA

To the Editor:—A patient for whom I have made a diagnosis of myotonia acquisita rather than myotonia congenita shows generalized rigidity with a tendency to corugation of muscles when they are stimulated. He shows no symptoms which would lead to the diagnosis of tetany. In line with the recommendations in the literature, he has been receiving quinine sulfate by mouth, beginning at 15 grains (1 Gm.) daily and increasing to as high as 30 grains daily. He has also received calcium intravenously, and on several occasions he stated that he "loosened up" for some time after the injection. However, now he does not seem to have a favorable response from the treatment I am giving him. Can you suggest any other form of therapy which might prove helpful?

George B. Fletcher, M.D., Hot Springs National Park, Ark.

ANSWER:—Not enough of the patient's symptoms are given for one to be sure that the diagnosis of myotonia acquisita is correct. One would want to know the patient's age, his previous history with regard to neuritis and whether the condition was familial or hereditary. One fact, however, probably points to a diagnosis of myotonia acquisita. The patient has been receiving quinine in adequate dosage without favorable response. This in itself indicates that the disease is of the acquired type rather than myotonia congenita. Alexander Wolf (*An Effective Form of Treatment for Myotonia, Arch. Neurol. & Psychiat.* 36:382 [Aug.] 1936) and other investigators have shown conclusively, and it has been observed by others, that patients with myotonia congenita respond quickly to quinine. It is possible, therefore, that the lack of response by this patient is helpful in making the diagnosis. A favorable response to quinine is not to be expected in the acquired form of myotonia.

It is felt by most investigators at the present time that myotonia acquisita is not a familial or hereditary disease. It may follow neuritis of a mild type, and the hypertrophy of the muscles found in this condition is indistinguishable from that found after neuritis. The condition usually occurs in early adult life, often is mild and may go on to complete recovery. The disease is rare and only a few cases have been reported in the literature. Myotonia congenita, however, is more common, although it too is rare. If there is any evidence of neuritis, such as tenderness along the course of the nerves, lost reflexes, vasomotor or trophic changes, or alterations in the electrical responses, treatment should be directed toward the neuritis itself.

Any specific treatment for myotonia acquisita is not known. Knud H. Krabbe (*Myotonia Acquisita in Relation to Post-neuritic Muscular Hypertrophies, Brain* 57:184 [June] 1934) simply stated that his patient "was given thyroid extract and improved considerably; power and rate of movement increased and the muscles seemed to diminish in bulk." If, as Krabbe suggests, the condition is due to "excessive" recovery from the polynneuritis, thiamin chloride appears not to be indicated. The response in patients with the atrophic form of myotonia to amphetamine sulfate is encouraging. From 5 to 20 mg. a day may be given, in two or four doses. Although no reports of its use in myotonia acquisita are at hand, it is worthy of trial. It must not be forgotten, however, that spontaneous recovery from myotonia acquisita is not unknown. Sources of infection in the body which might give rise to polynneuritis are to be sought for. Mild gymnastics are advocated and a warm climate is said to be beneficial.

FETOR ORIS

To the Editor:—Please discuss causes, physical and chemical, of feter oris arising from the oral cavity.

M.D., Massachusetts.

ANSWER:—Feter oris originating in the oral cavity may be divided into three types, arising from (1) retained food particles or their decomposition products, (2) decomposition of oral tissues or fluids and (3) volatile substances absorbed elsewhere in the body and released from oral tissues or fluids secreted into the oral cavity. By the use of a method described by Brening, Sulser and Fosdick it is possible to gain some idea of both the intensity of the odors and their source with respect to the part played by the lungs, nasal cavity and oral cavity.

There appears to be disagreement among investigators with respect to the importance of the role which food particles play. Some believe that they are relatively insignificant; others offer evidence that such substances as onion and garlic chewed but not swallowed may be detected from sixty to seventy-two hours after mastication. The period is appreciably longer than when

the same substances are ingested by capsule. The physical opportunities for lodgment and decomposition of food debris offered by the embrasures between the teeth, cavities produced by caries or other mechanical factors. Oral chemical reactions occurring in degenerative and suppurative lesions in the mouth such as pyorrhea are unquestionably of importance. Some believe that the stagnation of oral fluids and desquamation of epithelium of the mucosa may give rise to unpleasant odors. The lesions of dental caries affecting only the calcified tissues of the teeth are less significant, but the opportunities which they offer for the lodgment of food allow putrefactive changes, and their extension to the point of exposure of the dental pulp may initiate degenerative changes in that organ which can unquestionably contribute to fetor oris.

In addition to these regional causes there is considerable evidence indicating that the oral secretions may give up volatile substances which were assimilated by the blood and other tissue fluids from the gastrointestinal tract, the lungs or other organs. The existence of this systemic factor has been proved experimentally but its relative importance when evaluated with respect to the regional factors is still debatable. All must be carefully investigated when searching for a cause in a specific instance. The following references together with their bibliographies may prove of value to any one interested in pursuing the subject:

- Brenning, R. H.; Sulser, Glenn F., and Fosdick, Leonard S.: The Determination of Halitosis by Use of the Osmoscope and the Cryoscopic Method. *J. Dent. Research* 18:127 (April) 1939.
Sulser, Glenn F.; Brenning, R. H., and Fosdick, Leonard S.: Some Conditions That Affect the Odor Concentration of Breath. *J. Dent. Research* 18:355 (Aug.) 1939.

POSITIONAL CHANGE OF FETUS IN UTERO

To the Editor:—Can you give me some idea as to what might be found in the literature concerning change of position and presentation of the fetus during the last month of pregnancy? On two occasions in the antepartum clinic I have seen the diagnosis of the presentation reversed at delivery within a week of the last examination. When I talked to several physicians concerning this, opinion was varied. Most had had a similar experience, but many felt that they had been incorrect in their original diagnosis. A few were certain that their diagnosis had been correct and that the fetus had changed position. On Aug. 3, 1939, in our antepartum clinic we examined for the first time a 44 year old primigravida. In the attempt to ascertain the position of the fetus, neither the external nor the pelvic examination was entirely satisfactory. This was due to the fact that the patient was large and obese (250 pounds [113 Kg.]). Further examination disclosed a blood pressure of 180 systolic and 110 diastolic, edematous ankles and moderate anemia. A roentgenogram taken at this time showed the fetus in a transverse position with the head to the right. The fetus appeared to be near full term and according to the menstrual history delivery was due about August 25. We decided it would be best to hospitalize the patient, attempt to control her eclampsia, build up her blood and seek consultation as to the feasibility of performing a cesarean section. The consultant advised complete bed rest, restricted fluids, salt-free diet, iron and liver and an x-ray check-up in a week. After one week of this regimen the ankle edema disappeared, the blood pressure went down to 150/90, and the red count and hemoglobin improved. The roentgenogram taken at this time (August 11) showed a breech presentation with the sacrum to the right. In view of this observation it was decided to make pelvimetric determinations by means of roentgen precision stereoscopy. The next day (August 12) this showed a vertex presentation, with the occiput to the right anteriorly. There was no disproportion. On September 6 the patient went into labor and a roentgenogram taken at this time showed the presentation to be vertex with the occiput to the left. The patient was delivered of a living boy with low forceps. This series of roentgenograms, particularly the two taken in twenty-four hours which showed a change from breech to vertex presentation, was especially interesting, more so because this had taken place while the patient was at complete bed rest and there had been no attempted external manipulation. Can you tell me whether or not a change in presentation of a fetus over a twenty-four hour period is recognized as a fairly common occurrence and whether there has been any work done in this line and verified by x-rays?

Nicholas P. Dallis, M.D., Glen Cove, N.Y.

ANSWER.—Presentation and position are the result of a process of accommodation of the fetus to the uterus and the pelvis. Many factors may influence normal accommodation in the uterus during the last part of pregnancy and result in varying presentations and positions. An excessive amount of liquor amnii, relaxation of the abdominal wall, an unusually large pelvis, abnormalities of the fetus and abnormalities of the uterus are some of these factors. Normally when the presenting part becomes engaged in the inlet of the pelvis no change in presentation can occur. In the primipara engagement usually takes place during the last month of the pregnancy. However, when this does not occur a change of polarity and of position of the presenting part can easily take place. During the seventh and eighth months of gestation many babies present by the breech. These breech presentations most often change into cephalic before engage-

ment takes place. Many observers have noted a change in polarity within a period of hours or days.

The patient in question undoubtedly had a large pelvis, which may have been a factor in the change in polarity and position of the fetus. Undoubtedly, such changes in presentation and position occur commonly without the knowledge of physicians. No report of careful study of this problem by means of frequent roentgenograms has been found.

EOSINOPHILS IN RHINITIS—DEGREE OF SUFFERING IN HAY FEVER

To the Editor:—1. In a case of rhinitis of questionable etiology does the presence or absence of large numbers of eosinophils in the nasal secretions indicate or exclude hypersensitivity as the cause? 2. Two patients have received prophylactic treatment by the perennial method for dwarf and giant ragweed hay fever for the past three years. Prior to the onset of the fall hay fever season both received up to 10,000 pollen units of mixed extract. They were remarkably free of symptoms during the first two years but have suffered rather severely during the present season. Intervals of injection and dosage have been identical each year. What can be the explanation for this phenomenon? M.D., New York.

ANSWER.—1. The presence of a large number of eosinophils in the nasal smear is definite proof that the rhinitis is of an allergic nature. If only a few eosinophils are present the diagnosis becomes somewhat doubtful and must then be deduced from the history, the presence of some other allergic conditions in the patient or of allergy in the family and from cutaneous tests. The absence of eosinophils does not exclude allergy. If a patient with allergic rhinitis develops an ordinary infectious coryza, the nasal smear will usually show a temporary diminution or absence of eosinophils and a predominance of polymorphonuclear cells.

2. There are four possible explanations for the increased suffering. First, the ragweed hay fever season this year, in certain parts of the country, at least, has been much more severe than in any previous year since 1935. For example, in the Middle West the amount of ragweed pollen has been from 50 to 75 per cent greater than in 1938. Second, the material used for injections may not have been up to standard; perhaps it had deteriorated. New extracts should be used every year and some physicians prefer to change their solutions every few months. Third, the two patients may possibly belong to the small group whose symptoms seem to become aggravated more and more as they receive injections. Fortunately, the large majority seem to improve year after year under treatment. Fourth, some physicians believe that pollen varies in toxicity from year to year. This is difficult to prove, but from the large amount of hay fever suffering this season, it might well be a factor.

HERRMANN MEASUREMENTS OF HEART AND MALINER'S TEST

To the Editor:—Will you please evaluate, explain and give me some information on (1) Herrmann measurements of the heart and (2) Maliner's test. If the Herrmann measurements showed an enlargement of the heart but the cardiothoracic ratio was normal and there was no clinical evidence of any heart condition, would you not believe that the cardiothoracic ratio was probably the correct determination? M.D., Illinois.

ANSWER.—Herrmann's measurements of the heart consist of comparison of the weight of the left ventricle with the weight of the right ventricle by a special method of dissection different somewhat from that carried out by Lewis, in which the heart was dissected away in toto. Herrmann's method has been described in the *American Heart Journal* (1:213 [Dec.] 1925). The ratio which he found in the dog's heart, L/R (ratio of left ventricle to right ventricle), was 1.393 with a minimum of 1.153 and a maximum of 1.773. By Lewis's method this ratio averaged 1.461 with a minimum of 1.450 and a maximum of 1.880. Maliner's test, as reported by M. M. Maliner and W. F. Matthews (*Arch. Pediat.* 56:142 [March] 1939), is a modification of Master's two step exercise test. Maliner and Matthews studied a group of 200 children and twenty-five noncardiac clinical patients and came to the conclusion that the measure of exercise tolerance as determined by this two step test is fairly constant but that changes in the pulse rate are less important than variations in the systolic blood pressure. This exercise tolerance test was presented originally by A. M. Master and E. T. Oppenheimer (*Am. J. M. Sc.* 177:223 [Feb.] 1929) and was further discussed by Master (*Am. Heart J.* 10:495 [April] 1935). The roentgenographic cardiothoracic ratio may be normal with no clinical evidence of heart disease and yet the actual size of the heart, especially the ratio of right to left ventricle, may be greater than normal.

SUBACUTE GONORRHEA AND SULFAPYRIDINE

To the Editor:—A man aged 31 had intercourse on August 2 and first noticed a discharge on August 11. He came in for treatment at once and was started on sulfanilamide 80 grains (5 Gm.) daily for five days. The discharge became less for two days and then again became profuse. The dose of sulfanilamide was increased to 120 grains (8 Gm.) daily, and the discharge disappeared in three days. Examination of the prostate and seminal vesicles at that time showed no signs of involvement. A prostatic smear, however, was strongly positive for the gonococcus. The sulfanilamide was reduced to 80 grains daily, and the discharge promptly reappeared. Hand injection with mild protein silver 5 per cent was begun at this time. After a week of this treatment, the sulfanilamide was reduced to 45 grains (3 Gm.) daily. This dosage was maintained until September 6. While there was a decrease in the amount of discharge at that time, there was always some present. With the hope that the organisms would lose their apparent tolerance to the drug, the sulfanilamide was then discontinued for ten days, and irrigations of 1:5,000 acriflavine were given in the office every other day. The hand injections of 5 per cent mild protein silver were continued by the patient at the same time. The sulfanilamide was again given in a dosage of 120 grains daily for three days, then dropped to 80 grains daily. The discharge, while less in quantity, has still persisted and may be obtained at almost any time. The smear is still positive for gonococci, although considerable searching is necessary to find them. It seems to me that this patient has had more than sufficient treatment. Would you suggest that the treatment be continued or changed? What treatment do you believe advisable? What is M. & B. 693, and where can it be obtained? Some of the British literature seems to favor this drug over sulfanilamide.

M.D., Iowa.

ANSWER.—From the history given, this is a case of subacute gonorrhea probably with some involvement of the posterior urethra. Before instituting further treatment it would be advisable to do complete blood counts, including differential, since the large doses of sulfanilamide which have been given are apt to produce anemia or other blood dyscrasias. Complete physical examination is also indicated, with special attention to the peripheral nerves. With negative results from these tests it would be safe to institute therapy with sulfapyridine, which is M. & B. 693 and is sold by several leading drug houses. In this case the dose should be 60 grains (4 Gm.) the first day, 40 grains (2.6 Gm.) the second and third days and 30 grains (2 Gm.) for four more days. Local treatment in the form of hand injections of 5 per cent mild protein silver twice a day should be continued, but no more than 4 cc. should be injected and this after micturition. At the end of a week urethral and prostatic smears should be studied, and appropriate tests of cure such as passage of a sound followed by instillation of 0.33½ per cent silver nitrate, ingestion of alcohol and intercourse should be tried. If at any time the gonococcus is rediscovered, another course of sulfapyridine should be given exactly as before. This may be necessary because of the chronicity of the involvement and the previous use of large doses of sulfanilamide, which seems to necessitate a larger total dose of sulfapyridine. The effectiveness of sulfapyridine in gonorrhea is estimated to be from two to three times that of sulfanilamide; however, it is always necessary to administer local treatment with either drug.

EFFECT OF SACCHARIN

To the Editor:—What are the deleterious effects of the prolonged use of saccharin? I have a patient who has been using about 10 grains (0.65 Gm.) a day for several years. Occasionally he shows a questionable reaction for albumin in the urine. The patient also has an arrested case of pulmonary tuberculosis. His diabetes is fairly well controlled by diet and insulin.

V. F. Neumann, M.D., Norwich, Conn.

ANSWER.—Blodgett has reported that a patient of his with glycosuria used from 7 to 8 grains (0.45 to 0.52 Gm.) of saccharin daily for twenty-four years with never a symptom that could be attributed to saccharin. He also described several cases in which patients suffering from obesity and treated with diets restricted in carbohydrate had used saccharin daily for fifteen years without deleterious effect. Blodgett considered saccharin a condiment and not a drug. Wilcox studied the therapeutics of saccharin and concluded that it may be used indefinitely in amounts tolerable to taste without harm. Although Sollmann stated that it is harmless and that from 70 to 90 per cent is excreted unchanged in the urine, cases of saccharin poisoning have been reported by Grundfest and by Heilmann. However, no albuminuria was found and the doses used were enormous. By far the most complete study on the physiologic actions of saccharin was that made by Carlson and his associates for the Referee Board. They found that a dog with 75 per cent of its total kidney tissue removed by nephrectomy could be given from 5 to 20 Gm. of saccharin daily for six weeks without any effect on kidney function or nitrogen metabolism but that intravenous injection of from 10 to 25 Gm. of saccharin into a dog with only one kidney or into a normal dog resulted in some diminution of kidney function as determined by the phenolsulfonphthalein excretion during the first hour. Carlson and his co-workers pointed out that their short

term feeding experiments did not exclude the possibility of injurious effects of smaller amounts of saccharin taken over a long period, particularly by persons in the older age groups.

It appears from this evidence that the possibility in the case cited of 0.65 Gm. of saccharin causing albuminuria is remote. While final proof of the matter would require demonstrating that increasing the intake of saccharin caused increased albuminuria and vice versa, the more common causes of traces of albuminuria should be investigated before placing the blame on saccharin.

References:

- Blodgett, S. H.: Saccharin, *M. Rec.* 97: 521 (March 27) 1920.
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Grundfest, Karl: Ein Fall von Saccharinvergiftung, *Zentralbl. f. inn. Med.* 42: 234 (March 26) 1921.
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Sollmann, T. H., and Hanzlik, P. J.: An Introduction to Experimental Pharmacology, Philadelphia, W. B. Saunders Company, 1928, pp. 67-68.
Wilcox, R. W.: The Therapeutics of Benzoesulphonide, *M. Rec.* 98: 595 (Oct. 9) 1920.

ABORTION AND MENSTRUAL FLOW

To the Editor:—A healthy married woman aged 37, mother of two healthy children aged 9 and 5, has the following history: On May 26, 1939, she had her usual normal and regular menstrual period of the twenty-eight day type with five days' duration. On or about June 7 she became pregnant. On July 17 she was hospitalized for spontaneous threatened abortion. On July 22 the abortion was considered inevitable and the uterus was emptied by ovum forceps and curet. On July 29 she was discharged from the hospital after an uneventful postoperative course. On August 5 she was with her husband for the first time after the operation. On August 12 she started flowing at what she considered the right time had she not become pregnant. After the flow had continued for one week it was regarded by the family physician as functional bleeding, and during the second week of the flow antuitrin-S in the amount of 600 units was given in divided doses. During this second week of flow an occasional stringlike clot was passed but there was no pain. At the beginning of the third week of bleeding progesterone was given on two consecutive days in 1 unit doses. On the day of the second dose there were crampy pains in the pelvis and back, and a clot the size of a hickory nut was passed but not seen by the physician. On the third day of the third week of flowing the patient was examined by an obstetrician, who said the uterus was slightly enlarged and the os half the size of a finger. He advised a uterine stimulant and in three days the flow stopped and there has been no further show. 1. How soon after a fruitful coitus might an abortion occur? 2. If this was not an abortion, what might it have been?

M.D., Iowa.

ANSWER.—The involution of the uterus is relatively longer after an early abortion than after a term pregnancy. The woman in question was discharged from the hospital seven days after the uterus was emptied and had intercourse fourteen days after the abortion. Two reasons may be given for the uterine bleeding. Probably the real one is that it was a normal menstrual function, but it might have been from subinvolution of the uterus. Normal menstruation is frequently disturbed for a time following abortions and term pregnancies and usually calls for no treatment. It is difficult to see the reason for the treatment given, certainly as given at that time. Rest in bed, a few hot vaginal douches and ergot would seem to have been more logical. It is common for a multiparous woman to have a slightly enlarged uterus at the period examined. It is possible for an abortion to occur within a few days after a fruitful coitus. The age at which the ovum is embedded in the uterus is not settled but is probably not over eight days. De Lee says that an expelled ovum the size of a pigeon's egg is approximately 4 weeks of age, and one the size of a hen's egg from 6 to 7 weeks.

TUBERCULOUS EMPYEMA AND OLEOTHORAX

To the Editor:—Is there any solution that can be used effectively in cleaning up tuberculous empyema?

M.D., Chicago.

ANSWER.—There is no solution which is effective in cleaning up tuberculous empyema. Oleothorax, however, gives satisfactory results to the extent of from 60 to 70 per cent of the cases in which it is used. To replace the exudate, which is generally removed by aspiration at regular intervals, plain sterilized olive oil without medication is injected into the plural space. Irrigation with physiologic solution of sodium chloride or with diluted solution of sodium hypochlorite, if preferred, is done with a syringe having a large caliber needle. There is absolute bed rest during the course of treatment.

To guard against any untoward reactions, the first injections of oil are in small amounts, 5, 10 or 20 cc.; then more oil may be added fractionally until the space is filled or the desired indication is reached. In some cases, when the exudate persists, aspirations can be done below the oil level without removing the oil and the amount aspirated replaced with the oil.

This form of treatment has given excellent results in a large number of cases, and no ill effects result from the olive oil. When, however, the pathologic process in the lung beneath the purulent exudate is more advanced, as with secondary infection of the tuberculous empyema, cavitation, bronchopleural fistula or pleurocutaneous fistula, a thoracoplasty may have to be resorted to.

IRREGULAR MENSES AND OBESITY AT MENARCHE

To the Editor:—A girl aged 14 weighing 160 pounds (73 Kg.) is normal to physical examination except for being overweight. Urine and blood tests are normal. Her first menstrual period began Feb. 1, 1939, and was profuse for a week. I gave a preparation of iron to prevent any anemia and stated that menstruation would adjust itself, in all probability. The flow continued, however, and on February 10 her red cell count was 4,500,000. Owing to the general appearance of obesity I gave her thyroid extract, one-half grain (0.03 Gm.) twice a day, and antuitrin-S every other day for six or eight doses. The flow continued until February 23, at which time a curettage was done. The uterus and genital tract were apparently normal. The laboratory report showed the material from the uterus to be normal. While in the hospital, she was under the care of a gynecologist and was given antimenorrhagic factor tablets three times a day. Since then she has menstruated fairly regularly two or three times, but now her periods are getting closer together. The last was at an interval of two weeks. Treatment has consisted of thyroid extract, one-half grain twice daily given continuously, and antimenorrhagic factor, three times a day a week before each menstrual period. Between periods she has had a tiny amount of discharge which has been unrevealing. The parents are rather anxious as to her irregularity. Physically she is in good health. Would progesterone or gonadotropic substance or another of the glandular preparations be beneficial? M.D., Indiana.

ANSWER:—There is no need to give this child any treatment for her menstrual irregularities at the present time. Undoubtedly the same results would have been obtained without the curettage, which is rarely indicated at puberty. Since the patient is definitely overweight, she should be placed on a diet which will make her lose weight. This may be accomplished without thyroid therapy but in this case the small amounts of thyroid may be helpful. Irregularity of the menses is frequent at onset and may last a year or more. As long as the amount of blood is not excessive and the patient does not become anemic, no special treatment is needed.

CEREBELLAR ATAXIAS

To the Editor:—A patient with cerebellar ataxia has a brother who is worried about also having it because it is hereditary. This brother heard that glandular therapy is preventive treatment. If there is any glandular therapy or other treatment for cerebellar ataxia that is preventive, will you please advise me. M.D., Illinois.

ANSWER:—There is no known prophylactic (preventive) or active treatment of any of the cerebellar ataxias that are hereditary, familial or both. The ages of the patient and his brother are not mentioned. If the patient is adolescent, he probably has spinal cerebellar ataxia of Friedreich or hereditary cerebellar ataxia of Marie. If he is older (between 30 and 50) he may have the form known as primary progressive cerebellar degeneration of Holmes. All these varieties are due to a defective anlage in the cerebellar structures and there is no treatment.

TRANSMISSIBILITY OF TRACHOMA

To the Editor:—A man aged 54 has had trachoma for ten years. Recently he began supplying a community with raw milk. Should he be allowed to milk, bottle milk or work about the barn or milk house in any capacity? George S. Enfield, M.D., Bedford, Pa.

ANSWER:—It is necessary to bear in mind that (1) trachoma is not communicable to domestic animals; (2) the infection is disseminated by direct or indirect contact from eye to eye only, never by intestinal or other ports of entry; (3) in general, the dosage for implantation must be repeated or relatively massive; (4) the infectious agent or virus is rapidly inactivated by dilution or when once removed from its normal habitat, and (5) the contagiousness of a given patient decreases with duration of the disease, so that with the possible exception of an acute flare-up a case of ten years' standing would only rarely serve as a source of infection. In this particular instance, therefore, it may be said that, while the idea may offend one's sensibilities and perhaps even oppose more general precepts of public health, the possibility of spreading trachoma under the conditions outlined is extremely remote. Of course pasteurization of milk would eliminate remonstrances from the most conscientious of objectors.

Regarding the matter from the point of view of the patient, it must be remembered that employment about farms, barns and the like maintains a constant exposure to dust, strong variations in light and other factors which promote conditions for exacerbations of trachoma.

MAGNESIUM SULFATE IN CARDIAC ARRHYTHMIAS

To the Editor:—Please outline the rationale for and the technic of the use of magnesium sulfate in paroxysmal tachycardia. In what other forms of heart disease is it indicated?

Alice S. Cutler, M.D., Los Angeles.

ANSWER:—Theoretically and experimentally the magnesium ion is known to depress all muscle and nerve function, and so magnesium sulfate has been suggested for control of disordered heart rhythm, especially premature beats and paroxysmal tachycardia. However, with large enough doses to have such a depressing effect, the toxic action on the myocardium and on the central and peripheral nervous system is of important consideration; experimentally dilatation and standstill of the heart have been produced by magnesium salts. Actually little favorable effect has been found in the use of magnesium in disturbances of heart rhythm. Magnesium sulfate is much more useful in cardiac cases as a mild watery purge in congestive failure. It acts as an osmotic cathartic. Large doses, that is, enough to produce several stools a day, are to be avoided because of the fatigue that ensues. Magnesium is antagonized by calcium.

CORONARY DISEASE AND GOITER

To the Editor:—Is coronary disease more frequent among those who have goiter than among those who do not?

Richard E. Stifel, M.D., Cleveland.

ANSWER:—This is an important question, but a satisfactory answer cannot be given at the present time. What little evidence there is does not support the view that coronary disease is more frequent among those who have goiter. Angina pectoris is rare in patients with toxic goiter and, when it does occur, tends to disappear after a thyroidectomy. In patients with myxedema, angina may first appear during the administration of desiccated thyroid.

THROMBOPLASTIN

To the Editor:—In *The Journal*, July 29, page 381, is given a test for vitamin K deficiency using thromboplastin with directions for preparing the thromboplastin. Is the ordinary thromboplastin of the drug trade satisfactory? If not, where can the type described be purchased?

M.D., Florida.

ANSWER:—It is believed that none of the preparations of thromboplastin now on the market are suitable for use in the prothrombin test described in the article cited. It should probably be possible to market suitable material in dried form in tubes of a size appropriate for the test. With the directions given in the article mentioned, any one can prepare the material from fresh tissue at relatively slight expense.

NO ELECTRICAL STIMULATION EFFECTIVE FOR PREMATURE EJACULATION

To the Editor:—What apparatus can produce sinusoidal-foradic current of moderate rapidity used in the treatment of ejaculatio praecox to tone the weak and relaxed muscles of the penis? M.D., Philippine Islands.

ANSWER:—No electrical stimulation of muscle will tone weak muscles. With regard to erection of the penis and ejaculation, Wiggers states: "Before coitus can take place the male copulatory organ must become hard and erect. The increased rigidity is due to flooding of the cavernous spaces with blood as a result of dilatation of their afferent arterioles. Compression of external veins by skeletal muscle contraction does not occur. Secondly, the venous outflow from the efferent veins may be impeded, however, owing to compression from within against the rigid outer coat. Erection, which occurs coincidentally, is not due to muscular action but is produced through a mechanical leverage action of the suspensory ligaments attached to the posterior portion of the cavernous tissue."

CHAULMOOGRA OIL IN TUBERCULOSIS

To the Editor:—I have read with interest your note in the *Journal*, October 7, page 1432, on chaulmoogra oil in tuberculosis, in which you say "Unfortunately, there is no proof available that chaulmoogra oil has any beneficial effect in the treatment of tuberculosis in any form." I have been interested in this subject and, in going over the references that you cite, notice that one of the most recent reports on this subject is not included. I refer you to an article by Dr. J. Edgar Wallace (*Brit. M. J.* 1:1151 [June 5] 1937) in which he reports encouraging results following the intradermal injection of esters of hydnocarpus oil in lupus vulgaris, as follows: "The intradermal injection of hydnocarpus oil in the small number of cases so far available, has produced extremely encouraging results, and appears to offer certain advantages over other routine methods." I am bringing this to your attention because this reference is more recent than any that you cite.

Robert C. Page, M.D., Mount Vernon, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, December 2, page 2083.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: *Basic Science*. Tucson, Dec. 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson. *Medical*. Phoenix, Jan. 2. Sec., Dr. J. H. Patterson, 826 Security Building, Phoenix.

ARKANSAS: *Basic Science*. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Jan. 17. *Written examination*. Los Angeles, Feb. 26-29. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: *Basic Science*. Denver, Dec. 13-14. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver. *Medical Endorsement*. Denver, Jan. 2. *Medical Examination*. Denver, Jan. 3-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science*. New Haven, Feb. 10. Chairman, Dr. Charles M. Bakewell, State Board of Healing Arts, 1895 Yale Station, New Haven.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science*. Washington, April 22-23. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, April 2. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 23-25. Acting Superintendent of Registration and Education, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science*. Des Moines, Jan. 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, State Department of Health, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. E. Hassig, 905 N. 7th St., Kansas City.

MARYLAND: *Regular*. Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homopathic*. Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science*. Minneapolis, Jan. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical*. Minneapolis, Jan. 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity*. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity*. Helena, April 1. *Examination*. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: *Basic Science*. Omaha, Jan. 9-10. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination*. Carson City, Feb. 5. Sec., Dr. Frederick M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 29-Feb. 1. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity and Endorsement*. Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science*. Portland, Feb. 24. *Applications must be on file not later than Feb. 7*. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

PUERTO RICO: Santurce, March 5. Sec., Dr. O. Costa Mandry, Box 3834, Santurce.

RHODE ISLAND: Providence, Jan. 4-5. Sec., Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TENNESSEE: Memphis, Dec. 20-21. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WISCONSIN: Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

WYOMING: Cheyenne, Feb. 5. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

District of Columbia Reciprocity Report

Dr. George C. Ruhland, secretary, Commission on Licensure, reports nine physicians licensed by reciprocity on September 28 and October 18. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine.....	(1935)		Georgia
Georgetown University School of Medicine.....	(1927)		Maryland
Howard University College of Medicine.....	(1929)		Ohio,
(1935) North Carolina, (1936, 2) Virginia			
Johns Hopkins University School of Medicine.....	(1937)		Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1935), (1936)		Maryland

Indiana June Examination

Dr. J. W. Bowers, secretary, Indiana State Board of Medical Registration and Examination, reports the written examination held at Indianapolis, June 20-22, 1939. The examination covered fifteen subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Loyola University School of Medicine.....	(1938), (1939)		2
Northwestern University Medical School.....	(1939)*		1
University of Illinois College of Medicine.....	(1939, 2)		2
Indiana University School of Medicine.....	†, (1939, 98)		99
Harvard Medical School.....	(1939, 2)		2
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg.....	(1922)		1
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1937)		1

* License has not been issued.

† This applicant has completed three years' work and will not receive his degree or license until 1940.

Rhode Island October Examination

Dr. Robert M. Lord, secretary, Rhode Island State Board of Examiners in Medicine, reports the oral, written and practical examination held at Providence, Oct. 5-6, 1939. The examination covered twelve subjects and included seventy-five questions. An average of 80 per cent was required to pass. Twelve candidates were examined, all of whom passed. Three physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Georgetown University School of Medicine.....	(1937)		1
Harvard Medical School.....	(1938)		1
Tufts College Medical School.....			4
New York Medical College and			1
Jefferson Medical College of Philadelphia.....	(1939)		1
Vanderbilt University School of Medicine.....	(1937)		1
University of Toronto Faculty of Medicine.....	(1937)		1
Université de Paris Faculté de Médecine.....	(1936)		1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1935)		1

School	LICENSED BY ENDORSEMENT	Year Endorsement of
Yale University School of Medicine.....	(1937) N. B. M. Ex.	
Tufts College Medical School.....	(1936), (1937) N. B. M. Ex.	

Vermont June Examination

Dr. W. Scott Nay, secretary, Vermont State Board of Medical Registration, reports the written examination held at Burlington, June 14-16, 1939. The examination covered twelve subjects and included ninety questions. Seventeen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Johns Hopkins University School of Medicine.....	(1935)		86.8
University of Vermont College of Medicine.....	(1938)		86.1, 86.3,
(1939)* 81, 85.1, 85.1, 85.7, 85.8, 87.7, 88.1, 88.2, 88.5, 89.1, 89.8, 90.8			
McGill University Faculty of Medicine.....	(1936)		86.3
University of Edinburgh Faculty of Medicine.....	(1935)		86.5

Six physicians were licensed by endorsement from February 8 through July 14. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement of
Harvard Medical School.....	(1932), (1935) N. B. M. Ex.	
Tufts Medical School.....	(1936) N. B. M. Ex.	
University of Nebraska College of Medicine.....	(1937) Nebraska	
University of Vermont College of Medicine.....	(1933) N. B. M. Ex.	
University of Edinburgh Faculty of Medicine.....	(1937) N. B. M. Ex.	

* Licenses have not been issued.

Book Notices

Pneumonia with Special Reference to Pneumococcus Lobar Pneumonia. By Roderick Heffron, M.D., Medical Associate, the Commonwealth Fund. Cloth. Price, \$4.50. Pp. 1,086, with 18 illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1939.

The medical profession is indebted to Dr. Heffron for this scholarly volume on pneumonia, published by the Commonwealth Fund at a price permitting wide distribution. It is a well conceived and splendidly executed monograph of permanent value. Our current knowledge of pneumonia in the clinic, in the laboratory and in the community is presented with evident diligence, careful documentation and balanced judgment in twenty chapters dealing with causative organisms in pneumonia and pneumonia not due to pneumococci, the pneumococcus and type incidence in pneumonia, pathology of lobar pneumonia, aspects of immunity, experimental pneumococcal infections and pathogenesis of lobar pneumonia, epidemiology, measures for the prevention of pneumonia, symptoms of lobar pneumonia, physical signs in lobar pneumonia, clinical varieties of pneumonia and association with other conditions, special features in the course of the disease, complications, incidence and treatment, diagnosis, differential diagnosis, prognosis, recovery factors and duration of immunity, general therapeutic measures, serum treatment, results of serum treatment and continuing problems. In spite of the wealth of information presenting our current knowledge of the pneumonias, advances in this field appear so frequently that new editions or supplements may be expected. Sulfapyridine has greatly augmented our capacity to treat the pneumonias and their complications. The whole problem of sulfapyridine fastness has developed since the book went to press. The relative places of sulfapyridine and of serum in therapy are still *sub judice* and the appropriate use for each must be determined. In a comprehensive presentation, the choice of data for inclusion is at times a matter of fine discrimination, which has been well exercised by Dr. Heffron. Nevertheless greater elaboration of the subject of radiographic diagnosis and mention of the significance of lobar segments (described by Kramer and Glass) would have been advantageous. The work of Jacob Fine and others in connection with the treatment of abdominal distention with oxygen is not mentioned nor that of Lamar in connection with the influence of antibody on the lysis of pneumococci. Certain clinical anatomic terms have been saved from oblivion, such as "apical pneumonia," "abortive," "central" and "terminal"; these might well have been "liquidated" in the interest of the etiologic classification, which dominates the volume. The statement that "clinical differentiation of bronchopneumonia from lobar pneumonia is usually not difficult" is not in accord with the experience of many clinicians. The criteria offered for differentiation are not adequate, especially for the infections of children. Of great value is the well selected and inclusive bibliography. The convenience of the excellent index would be enhanced if more synonyms were listed and if there were more cross references. Because it is a thoroughly reliable source book on an important and developing topic of general medical interest and a model of logical presentation, this volume should be on the "must" list of all who provide books for students and practitioners of medicine.

A Descriptive Atlas of Radiographs: An Aid to Modern Clinical Methods. By A. P. Bertwistle, M.B., Ch.B., F.R.C.S. Fourth edition. Cloth. Price, \$15. Pp. 576, with 852 illustrations. St. Louis: C. V. Mosby Company, 1939.

The author seeks to furnish a pictorial reference book of those normal and abnormal conditions which are met more commonly in practice; rare lesions are omitted, except when of special interest. The volume is primarily intended for the use of the clinician, whose chief concern is diagnosis. No special technical knowledge is required in using this atlas. The illustrations, on the whole, are excellent. Some, however, are too small or have lost detail in reproduction and fail to demonstrate the lesion. Most of the roentgenograms are accompanied by diagrammatic sketches, which depict the lesion under consideration. The small size of these outline drawings, the rather crude sketching and the almost illegible microscopic lettering detract greatly from the effectiveness and value of the diagrams.

Standardization of presentation would facilitate the reader's orientation in examining films. For example, the chest films show the heart either on the left or on the right; the stomach and gallbladder pictures are likewise either in the accepted anteroposterior view or in reverse position. Figure 21 and its accompanying diagram are in mirror-image relationship. Fractures are overemphasized in a series of 112 roentgenograms, whereas the vascular system commands only thirteen illustrations; there is no cardiac section. A number of diagnoses are questionable (for example, chronic appendicitis; congenital coxa vara is called Legg-Perthe-Calvé's disease in figure 66; the history and roentgenograms accompanying figures 75 and 76 suggest recovery from paraplegia resulting from cord compression in tuberculous spondylitis rather than spina bifida; the examples of acute osteomyelitis show enough late changes to be considered subacute or chronic. Only a few errors of composition were found. Figure 611 is upside down. Figures 830-834 are grouped without individual identification. The name of Dr. Legg is misspelled "Legge." Despite the foregoing criticisms, the atlas fulfils its purpose to a large degree in providing the general practitioner with a handy reference volume of radiographic interpretation of common lesions.

Sclerosing Therapy: The Injection Treatment of Hernia, Hydrocele, Varicose Veins and Hemorrhoids. Edited by Frank C. Yeomans, M.D., F.A.C.S., M.R.S.M., Professor of Proctology and Attending Surgeon, New York Polyclinic Medical School and Hospital, New York. Cloth. Price, \$6. Pp. 337, with 185 illustrations. Baltimore: William Wood & Company, 1939.

Sclerosing therapy has emerged from the stage of experiment and empiricism. For a long time the domain of itinerant quacks and misunderstood pioneers, it is now taking a definite place in the hands of well trained physicians whose experience is not limited to this form of treatment. It is not the possession of a syringe and needle that qualifies the general practitioner to use such methods but a thorough understanding of the nature of the disease whose treatment by injection has been assembled in this group of four monographs.

The first of these, on the injection treatment of hernia by Bratrud, is perhaps the least convincing and encouraging. In spite of his careful selection of cases and surely an excellent technic, he reports recurrences in bilateral, indirect inguinal hernias in 31 per cent, the direct inguinal hernias giving a recurrence rate of 40 per cent. This, in the light of our present surgical methods, using silk and local anesthesia, is far too high. The microscopic sections showing proliferation of fibroblasts and extensive fibrosis occluding the hernial openings reveal nothing of the tensile strength of such tissue. Unless such studies become known, one will have to suspect that this fibrous tissue gives way and splits up easily, especially when more five year cures are known. The chapter on trusses is valuable and instructive. That old, handicapped patients who have trouble retaining their hernias with a well fitting truss may do so after a series of injections is a point well taken. While the author has taken a conservative attitude in his indications, further restrictions are bound to come when the limitations of this method are more clearly recognized. Obviously, the general practitioner will be tempted to try such a method instead of a surgical dissection, but this is justified only if his results are not inferior. This has not been shown by the data presented.

The discussion of the injection treatment of hydrocele by Dr. George J. Hoch is short, concise and entirely adequate. He advocates the use of quinine and urea hydrochloride and carefully lists the contraindications to its use.

The monograph on the injection treatment of varicose veins has been written by Harold J. Shelley and is undoubtedly the best monograph on this subject. He has not only completely covered the important literature but shows a complete familiarity with all the aspects of treatment, which permits him to choose or combine surgical methods with treatments by injection.

The fourth treatise on the injection treatment of hemorrhoids is written by Dr. Frank C. Yeomans, one of the most experienced proctologists of the country. He makes it clear that only uncomplicated, internal hemorrhoids should be injected, which comprise about 50 per cent of all cases. The solution preferred is phenol. He stresses the fact that the injections are made in the submucous or interstitial tissues and not into

blood vessels and thus the requirements for a successful solution differ from those used in the treatment of varicose veins.

The printing and illustrations are excellent; the language of the monograph on hernia is careless and contains a few errors in printing. The book is strongly recommended for the general practitioner as a preliminary study followed by guided clinical experience.

Les embolies cérébrales: Études de pathologie expérimentale sur les embolies solide et gazeuse du cerveau. Par Maurice Villaret, professeur à la Faculté de médecine de Paris, et René Cachera, médecin des hôpitaux de Paris. Paper. Price, 32 francs. Pp. 134, with 89 illustrations. Paris: Masson & Cie, 1939.

With the help of a window in the skull of dogs, the authors observed and photographed the pial vessels with a magnification which enabled them to study the arteriolar system and its reaction to cerebral emboli. Solid emboli were produced by the introduction of finely pulverized marble or glass with particles from 80 to 150 microns in diameter into the carotid artery. The immediate reaction to such emboli was a widespread arteriolar spasm, which was present even at a distance from the plugs. These observations were made from the time of embolization up to three hours. In another group of experiments the late vasomotor disturbances from one to 123 days after the embolism were studied. Again there were marked vasospastic phenomena alternating with areas of vasodilatation; the current in the veins was retarded and sometimes reversed. The authors also studied the development of collateral circulation and the "in vivo" appearance of cerebral infarcts. In the second series air was introduced either in the pulmonary vein or in a systemic vein; the vascular system of the pia mater, however, did not react with any vasomotor disturbances to the plugs of air; it simply caused a mechanical obstruction with its natural consequences. In one instance a simple puncture of a pulmonary vein resulted in a demonstrable air-bubble in one of the pial vessels. The authors also presented evidence that air introduced through the saphenous vein may pass through the pulmonary bed and produce cerebral air embolism. Eighty photomicrographs of the pial vessels illustrate the monograph. They convincingly demonstrate the disturbed vasomotricity of the cerebral vessels. The original method of Forbes has been employed here to add to the understanding of cerebral vascular accidents. While the authors do not attempt any clinical deductions, the application of this knowledge to clinical cases of cerebral embolism and possibly other vascular accidents is stimulated. For the physiologist, neurologist and men engaged in research on the vascular system the book is strongly recommended.

John Howard (1726-1790) Hospital and Prison Reformer: A Bibliography. By Leona Baumgartner, M.D., Ph.D. With introduction by Arnold M. Muirhead, M.A. Reprinted from *Bulletin of the History of Medicine*, Vol. VII, No. 5 and No. 6, 1939. Boards, Price, \$1. Pp. 79, with 9 illustrations. Baltimore: Johns Hopkins Press, 1939.

John Howard became interested in conditions in prisons when, shortly before the age of 50, he was appointed high sheriff of Bedfordshire. On attempting to correct prison abuses, he was told that there was no precedent for the expense to be incurred. "I therefore rode into several neighboring counties in search of one; but I soon learnt that the same injustice was practiced in them; and, looking into the prisons I beheld scenes of calamity which I grew daily more and more anxious to alleviate. In order therefore to gain a more perfect knowledge of the particulars and extent of it by various and accurate observations I visited most of the county gaols in England." Howard extended his observations to the prisons and hospitals on the continent and published his reports under the general title of "The State of Prisons in England and Wales . . . and an account of some Foreign Prisons," which passed through a number of editions. The present volume is the bibliographic record of these editions and appended reports, reprinted from the *Bulletin of the History of Medicine* VII, Nos. 5 and 6, 1939, together with a biographic note on Howard by Arnold M. Muirhead, whose collection of *Howardiana* contributed to the completeness of the bibliographic material. There are added sections on biography and criticism, and on contemporary biographic notes and reviews. Howard's method of bringing about reform was to ascertain and publish the facts. The

justice of his cause and the value of his efforts were recognized by his contemporaries, but little headway toward improvement was made against precedent and custom during his lifetime. A contemporary reviewer (1789), commenting on Howard's lazzarettos, reflects the current opinion of his time, somewhat pessimistic but perhaps more prophetic than he knew. "His idea of a perfect hospital contains much (we suspect, very useless) refinement but as it is the refinement of Mr. Howard we shall subscribe to it. . . . On the whole the volume contains many facts of importance and many observations of real utility . . . and we leave it with the best founded expectations that our author's past and future labors will not be wholly in vain." This book is an excellent piece of bibliography.

Étude toxicologique, physiologique et histophysiologique de l'hémoglobine en solution administrée à dose thérapeutique par voie veineuse à des chiens en état d'anémie aiguë par saignée. Par le Docteur Raymond Castagnou, docteur en pharmacie. Paper. Pp. 403, with 58 illustrations. Bordeaux: Imprimerie E. Drouillard, 1939.

This book, in organization and content, resembles a doctor's thesis as the term is understood in the United States. It consists almost entirely of experimental data obtained from a series of fifty-three dogs which were first exsanguinated and then given transfusions with solutions of canine or equine hemoglobin. The object of the study was to ascertain whether solutions of either homologous or heterologous hemoglobin could be used in the treatment of anemia from acute hemorrhage. Extensive data on the freezing-point depression, surface tension, specific gravity, viscosity, osmotic pressure, hydrogen ion concentration and electrolyte content of hemoglobin solutions are given. It was found that such solutions were toxic to many animals, producing mild azotemia with recovery or oliguria and uremia with fatal outcome. An acute syndrome sometimes occurred characterized by collapse, vomiting, diarrhea, hemorrhages from the entire gastrointestinal tract, and death within a few hours. In his toxicologic studies the author, curiously enough, ignored the experimental work of Yorke and Nauss, Baker and Dodds, and DeGowin, Osterhagen and Andersch, which demonstrated a relationship between the reaction of the urine and the occurrence of renal insufficiency from hemoglobinuria. He studied the disappearance of hemoglobin from the blood stream by quantitative estimations of the hemoglobin in the urine and analysis of iron in the various organs. From 2 to 54 per cent of the pigment was excreted in the urine, while the organs most concerned in retaining the iron were the spleen, lungs, liver and kidneys in order of activity. By means of blood gas analysis the author demonstrated that the transfusion of hemoglobin solutions could replace blood as a vehicle for gaseous exchange for from eight to twenty-four hours but that the time was limited by the excretion or immobilization of the hemoglobin. It is also admitted that the toxicity of the hemoglobin solutions is a further disadvantage in applying such a procedure clinically. The illustrations are all photomicrographs of kidneys, lungs and livers showing reactions from hemoglobin. The extreme length of the publication is partly due to the fact that the detailed protocols of individual animals sometimes occupy three or four pages. The book should be of interest to workers in the field but contains little that can be applied clinically.

Elements of Statistical Reasoning. By Alan E. Treloar, Ph.D., Associate Professor of Biostatistics, University of Minnesota, Minneapolis. Cloth. Price, \$3.25. Pp. 261, with illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Limited, 1939.

"Every set of factual data in science that may be assembled for statistical analysis presents questions which are intimately concerned with the validity of the data themselves. Misinterpretation all too readily flows from routine application of statistical procedures. . . . That which comprises good health at one age may quite properly be regarded as poor health at another age. It is virtually impossible to reach general concordance of judgment in subdividing variation in the state of health into even very few subgroups. . . . The accuracy of mathematical deductions from data must inevitably be limited in some way by the precision and adequacy of the observations themselves. Emphasis must always be laid, therefore, on the necessity for the exercise of critical judgment in the collection

and recording of data. Precision in measurement and care in classification materially enhance the value of observations."

In statements such as these does the author of this addition to discussions of the statistical method in science emphasize the importance of the fundamental data on which the statistical reasoning is based. The present frequency of biologic and medical papers with a statistical bias indicates the need for constant review of the fundamental facts which serve as their basis. In other respects also the author has satisfactorily considered the methodology of statistics as applied to most of the problems faced by the biologist. The mere publication of books on this subject is in itself evidence of at least potential demand; indeed, courses in this field might well be required in the preclinical years, supplemented by practical application during later phases of the medical curriculum.

Varicose Veins. By Alton Ochsner, B.A., M.D., D.Sc., William Henderson Professor of Surgery and Director of the Department of Surgery, School of Medicine, Tulane University of Louisiana, New Orleans, La., and Howard Mahorner, B.A., M.D., M.S., Assistant Professor of Surgery, School of Medicine, Tulane University of Louisiana. Cloth. Price, \$3. Pp. 147, with 52 illustrations. St. Louis: C. V. Mosby Company, 1939.

The subject of varicose veins is admirably covered in this authoritative, concise monograph. With the help of excellent diagrams and photographs, the authors have not only given a complete history of the treatment of varicose veins but have reviewed the anatomy, pathology, physiology, etiology, clinical aspects, examination and treatment of the patient suffering from varicose veins and ulcers. The book is dedicated to Rudolph Matas, "universally acclaimed father of vascular surgery," who wrote an interesting foreword. It is gratifying to see that from the hands of itinerant quacks and a few zealous pioneers this subject is now taken over by surgical teachers of international reputation, whose didactic skill and original research have been so well incorporated to produce the first real textbook in this field. One point should be emphasized in recommending this book to the general practitioner: The injection treatment of varicosities is technically so easy that it has become widely popular with the medical profession. This monograph dwells at length on appropriate diagnostic tests which permit the formulation of a rational therapy. This almost invariably includes a combination of ambulatory ligations at the proper levels with the injections. The wholesale and uncritical injections into dilated veins have often discredited the treatment and incurred unnecessary loss of time and expense for the patient.

The Anatomy of the Nervous System from the Standpoint of Development and Function. By Stephen Walter Ranson, M.D., Ph.D., Professor of Neurology and Director of Neurological Institute, Northwestern University Medical School, Chicago. Sixth edition. Cloth. Price, \$6.50. Pp. 507, with 382 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

In this edition of Ranson's well known and excellent textbook on neuro-anatomy there has been extensive revision in various chapters without material enlargement. The connections of the thalamus with the cortex, brachium conjunctivum, medial lemniscus, spinothalamic tract and secondary trigeminal tracts are discussed in detail. As in the past, emphasis has been on the developmental and functional significance of structure. There are twenty-one chapters. There is a laboratory outline of neuro-anatomy with clinical illustrations. There is an excellent bibliography. The illustrations are beautiful and excellently labeled. Every student as well as every neuropsychiatrist, neurophysiologist and neuro-anatomist should have this book.

Rural Medicine. Proceedings of the Conference Held at Cooperstown, New York, October 7 and 8, 1938. Cloth. Price, \$3.50. Pp. 268. Springfield, Illinois & Baltimore: Charles C. Thomas, 1939.

Although this was primarily a local conference centering about the activities of the Mary Imogene Bassett Hospital at Cooperstown, N. Y., the speakers were drawn from a wide circle. There were four subjects under discussion: rural morbidity, health department programs and school health programs in rural areas, postgraduate medical education in rural areas, and economics of rural medicine. In spite of a well organized program with a wide variety of speakers, the proceedings of the conference are not simply a presentation of divergent views, lacking in continuity and comprehensiveness. The material assembled under these various heads constitutes valuable material for the

study of the problems of rural medicine. It may be significant of an advance in the discussion of medical problems that no speaker attempted to present a panacea. The rather extensive bibliography on rural medicine that is included can hardly be considered either adequate or impartial, but it is at least a beginning which should form a basis for a more complete bibliography.

Die Diät- und Insulinbehandlung der Zuckerkrankheit für Studierende und Ärzte. Von Dr. Franz Depisch. Mit einem Vorwort von Prof. Dr. N. v. Jaglé. Second edition. Paper. Price, 4.80 marks. Pp. 155, with 10 illustrations. Vienna: Julius Springer, 1939.

The author stresses the importance of proper diet in treatment of diabetes, emphasizing the fact that the use of insulin without regard to diet is sometimes harmful. That the cost of insulin to the individual and to institutions is often prohibitive is alone a reason for greater importance being attached to diet, plus the fact that diet is at times even more vital than insulin, are everywhere stressed by the author. It is felt, of course, that the economic side must be considered, but one cannot go as far as the author when he insists that doctors should use insulin sparingly. Certainly the good of the patient and not the cost of the treatment is the first consideration. The author stresses the importance of insulin and protamine zinc insulin being used only by doctors with a thorough knowledge of their therapy. He makes special mention of surfen, a new slow-acting insulin of which we know little in this country because of its failure yet to be introduced into our clinics. Dr. Depisch discusses thoroughly what most of us already know—the preventive side of diabetes by treatment for obesity. At the end of each chapter is a summary pointing out the high lights and making the book simpler to read and to understand. At the end of the book is an excellent summary. A careful reading of this book is a requisite to doctors and medical students.

Gregg Medical Dictation Series: A Course for the Student Who Desires to Become Proficient in Taking Medical Dictation. Volume I: General Medicine. Volume II: Surgery. Volume III: Pediatrics. By Marie Zweegman Yates, Director, Zweegman School for Medical Secretaries, San Francisco, California. Experimental edition. Paper. Price, \$1 per volume. Pp. 90; 88; 89. New York: Gregg Publishing Company, 1939.

When completed, this series will comprise sixteen volumes. Three volumes have now been issued, each a complete unit devoted to a single phase of the subject, such as general medicine, surgery and pediatrics. The object is to acquaint the student with the vocabulary of the subject treated and to present the easiest means of transposition into shorthand symbols. For this purpose, case histories are given in each volume, as well as a glossary containing pronunciations and definitions of words appearing in the Eighteenth Edition of the American Illustrated Dictionary by Dorland, and the Gregg shorthand outlines for them. The series should be most helpful to those for whom it is being prepared.

Elementary Anatomy and Physiology. By James Whillis, M.D., M.S., F.R.C.S., University Reader in Anatomy, Guy's Hospital Medical School, London. Foreword by T. B. Johnston, M.D., Ch.B., Professor of Anatomy, University of London. Cloth. Price, \$3.50. Pp. 342, with 87 illustrations. Philadelphia: Lea & Febiger, 1939.

This is a well balanced elementary treatment of the anatomy and physiology of the body. The text is clearly written and the diagrams and drawings are well designed to make clear to the beginner the main facts of structure of the human body. The physiologic facts presented should enable the student to begin to think of organs to some extent in terms of their functions. Both anatomy and physiology are presented in too elementary a fashion to make the book of much value to American medical students, in view of the organization of courses in these subjects in the United States. It should, however, meet a real need in premedical courses and especially in courses in nursing education. If medical students could enter the first year of the medical course with the knowledge of anatomy and physiology which this book would give them, they could go on to gain a detailed knowledge of the body much more easily than is now true for the majority. Numerous books have appeared in recent years with the avowed purpose of simplifying or abbreviating anatomy. The present volume seems to have accomplished these purposes well for the beginner, while making it obviously necessary for the more advanced student to seek more complete textbooks.

Die Behandlung von Hauttuberkulösen an der Giessener Lupushellstätte 1937/38. Von Dr. Adolf Kreiner. Mit einem Geleitwort von Prof. Dr. W. Schultze, Leiter der Lupushellstätte Giessen. Nr. 73, Tuberkulose-Bibliothek, Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Paper. Price, 6 marks. Pp. 61. Leipzig: Johann Ambrosius Barth, 1939.

In this monograph the author reports his experiences in the treatment of 536 cases of cutaneous tuberculosis, chiefly lupus. The advantages of Grenz ray therapy over x-rays are stressed even though the cosmetic results were not always satisfactory. From three to five doses of 4,000 roentgens per field with 9 kilovolts, 20 milliamperes, were found to give the best results. In most cases this treatment was preceded by operative removal of the lupus foci with the electric cutting current, a wire loop being used to remove the entire area with a margin of healthy skin. The treatment is painful and requires local anesthesia and careful after-treatment. Contact therapy with ultraviolet radiation from a water-cooled quartz mercury vapor arc lamp either alone or preceded by electrical ablation is used in lupus in children and in cases that had been previously treated with roentgen rays or radium. Old tuberculin (Koch) is used as an adjunct beginning with minute doses (0.1 cc. of 1:1,000,000 dilution) and is especially effective in papulonecrotic tuberculids. Dietetic treatment with a salt poor, high vitamin diet is not recommended on account of the long duration of the treatment and the expense. Photographs of patients have unfortunately been omitted so that it is difficult for the reviewer to appraise the cosmetic results.

Studies From the Center for Research in Child Health and Development, School of Public Health, Harvard University. I: The Center, the Group under Observation, Sources of Information, and Studies in Progress. By Harold C. Stuart, M.D., and Staff. Monographs of the Society for Research in Child Development, Volume IV: No. 1 (Serial No. 20). Paper. Price, \$1.75. Pp. 261, with illustrations. Washington, D. C.: Society for Research in Child Development, National Research Council, 1939.

This small monograph contains a description of the research and progress at the Center for Research in Child Health and Development at the Harvard School of Public Health. The organization of the center is given in detail, both the physical facilities and the composition of the staff being enumerated. Types and methods of examination are fully outlined and charts are included to indicate the types of dietary information obtained as well as physical data derived from the subjects under study. This monograph is well illustrated, showing the various instruments used for taking the physical measurements. Several family studies are given in detail and are illustrated with photographs and charts. This monograph should be of great interest to those engaged in similar studies.

Histopathology of the Teeth and Their Surrounding Structures. By Rudolf Kronfeld, B.S., M.D., D.D.S., Professor of Dental Histology and Pathology in the Chicago College of Dental Surgery, School of Dentistry, Loyola University, Chicago, Illinois. Second edition. Cloth. Price, \$7. Pp. 504, with 438 illustrations. Philadelphia: Lea & Febiger, 1939.

This is a thorough revision of the first edition, which has been completely rewritten with the inclusion of much new material. Many of the changes in arrangement and content are such as to conform with the recommendations of the Report of the Curriculum Survey Committee of the American Association of Dental Schools. Some of the material included is not strictly histologic in character, as, for example, the first two chapters, on anomalies in the shape and size of the teeth and the physiology and pathology of tooth calcification. This departure is highly commended; indeed, the second chapter should be read carefully by all scientists and practitioners of both medicine and dentistry interested in tooth calcification. The content is liberally inclusive and is a thoroughly adequate presentation of the subject as indicated by the title. The descriptive material is liberally supplemented by well chosen illustrations which are also almost technically perfect. At the close of each chapter is a carefully selected bibliography of the more pertinent articles bearing on that part of the subject. The nomenclature and classification of gingivitis and pyorrhea used by the author are those of Gottlieb; from the point of view of the clinician this is both confusing and unsatisfactory, in spite of the table on pages 316 and 317 differentiating the various forms. However, simplification and clarification

of this situation continues to be a problem awaiting solution. The influence of the enamel cuticle in protecting the tooth from the onset of dental caries (page 106) would seem to be overemphasized. The implied acceptance of Bunting's opinion that the only significant difference thus far known between caries-free and caries-susceptible persons is in the number of *Bacillus acidophilus* organisms in the mouth is hardly justified in the light of current chemical research. In spite of these and possibly other minor criticisms, this is without doubt the leading textbook in this field in the English language.

German-English Science Dictionary for Students in the Agricultural, Biological and Physical Sciences. By Louis De Vries, Professor of Modern Languages, Iowa State College, Ames. With the collaboration of Members of the Graduate Faculty. Fabrikoid. Price, \$3. Pp. 473. New York & London: McGraw-Hill Book Company, Inc., 1939.

The author of this German-English science dictionary received the cooperation of many of his colleagues in its compilation. The number of sciences that had to be studied necessitated a rigid selection of words. Not all the names of animals, plants, insects or chemical compounds have been included. These omissions will of necessity impair somewhat its usefulness but no doubt some of them will be corrected in future editions.

An Introduction to Modern Genetics. By C. H. Waddington, Sc.D., Fellow of Christ's College, Cambridge. Cloth. Price, \$4. Pp. 441, with 160 illustrations. New York: Macmillan Company, 1939.

The aim of this book is to give an account of the more important recent developments in the field of genetics. Although the literature on the subject is most extensive, the author has succeeded in presenting a relatively brief account. On the whole, however, the book seems more suitable for collateral reading in connection with a college or university course in genetics than for the general perusal of the casual reader even when possessed of considerable biologic background. To the physician the brief chapter on human genetics is naturally the most interesting.

Peripheral Vascular Diseases: Diagnosis and Treatment. By William S. Collins, B.S., M.D., Chief of the Clinic for Peripheral Vascular Disease, Israel Zion Hospital, Brooklyn, and Nathan D. Wilensky, M.D., Assistant in Clinic for Peripheral Vascular Disease, Israel Zion Hospital. Cloth. Price, \$4.50. Pp. 243, with 77 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

This monograph has been written to offer the physician a reference work which may aid him in the management of peripheral vascular disease. For the most part this task has been accomplished. Some of the chapters, such as the one on peripheral vascular sclerosis, follow closely the teachings of Winternitz, are beautifully presented and are profusely illustrated. Other subjects, such as congenital vascular anomalies, aneurysms and varicose veins, are hardly mentioned. The surgical treatment of acute arterial embolism is not encouraged. The classification of peripheral vascular disorders is somewhat cumbersome and overlapping. While certain tests and apparatus which the authors have devised are treated in great detail, others are less favorably treated, which gives the unbiased reader a feeling of false proportions. The design and printing of the book and the colored plates satisfy the highest standards of medical publications.

Dentistry for Children. By John Charles Brauer, D.D.S., A.B., M.Sc., Head of Department of Preventive Dentistry, University of Iowa School of Dentistry, Iowa City. With Special Chapters by L. B. Hiley, B.A., D.D.S., M.S., Professor, and Head of Department of Orthodontics, School of Dentistry, University of Iowa, and Julian D. Boyd, M.S., M.D., Associate Professor of Pediatrics, College of Medicine, University of Iowa. Cloth. Price, \$6.50. Pp. 373, with 335 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

This book considers the many problems found in the modern dental office. The subjects are presented in a concise manner, and special mention is due the illustrations, which are so carefully presented as to make many pages of interesting study. There is sufficient review of the basic anatomy and structural parts to be interesting, but the author does not "fill in" with lengthy reviews. Instead, the newer more vital subjects in connection with preventive dentistry together with chapters devoted to instructive suggestions in managing the child patient are thoroughly treated. Also the correlation of the author's writings with those of the orthodontist and the pediat-

trician insures thorough coverage of the subject from every available angle. Chapter 9, devoted to preventive orthodontics, is actually saturated with helpful suggestions for the solution of the problems of the general practitioner. The illustrations and explanations offered in this chapter would be exceedingly fine for the practicing dentist to have available in his office for more fully explaining to the public their various problems. The book is highly recommended to the student as a textbook, to the practicing dentist as a reference book, and to both as an indispensable guide for better understanding the unique field of children's dentistry.

Die Zuckerkrankheit. Von Prof. Dr. Wilhelm Falta. Second edition. Paper. Price, 7 marks. Pp. 154. Berlin & Vienna: Urban & Schwarzenberg, 1939.

This little manual on diabetes includes discussions of diagnosis, differential diagnosis, pathogenesis, dietetic management, complications and the use of the old and newer insulins. It reflects largely the views of its author. For American readers the excellent books available in English will probably prove more useful.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Negligence in Treatment of Chest Wound by "Visiting Surgeon" of Hospital.—The plaintiff, by his next friend, sued the defendant physician to recover damages for alleged malpractice. The trial court directed a verdict for the defendant and thereafter reported the case to the Supreme Judicial Court of Massachusetts on a stipulation of the parties.

When about 11 years old the plaintiff, in the early part of January 1935, was injured while coasting. A runner of the sled of another boy struck him, went through his clothing and made a wound in his chest. He was brought to a hospital, where he was examined by the defendant, who was "visiting surgeon," and another physician who was "house officer." The defendant directed the taking of roentgenograms, the results of which were negative. Under his direction, the wound was washed with "green soap" and closed by sutures, and antitoxin was injected in the patient's arm. The patient remained in bed at the hospital for nine days, during which period he was treated daily by the "house officer" and seen by the defendant on his daily rounds of the hospital. After an eleven-day stay he went home on January 14 and thereafter for a period of about two months visited the outpatient department of the hospital weekly and was treated by the "house officer." During this period, pus appeared in the wound and on two occasions the "house officer" picked from it some threads. At the end of three months the wound was only partially healed and the patient was taken to another hospital where an examination disclosed a chronic sinus of the chest wall from which was removed a small piece of wool fabric. Two weeks thereafter the wound had healed.

The defendant's evidence tended to show that on examining the patient at the time he entered the hospital the defendant found a lacerated wound over the left breast. The chest wall was exposed and there was some bleeding. The defendant directed the "house officer" to give the treatment earlier described, admonishing him to be careful in any scraping of the wound because the chest wall was so thin. The purpose of the treatment directed and given was to get out all the foreign material possible, to give anything left in the wound room to get out, and to drain and help evacuate the wound of pus or foreign material. The defendant never saw the patient after he left the hospital. The defendant testified that when the patient left the hospital the wound was discharging serum, not pus, and that such a wound would take three or four months to heal; that the treatment given was good surgical treatment and that no more could have been done at the hospital than was in fact done.

Viewing all the evidence in the case in the light most favorable to the patient, the court said, a basis was not afforded for finding the defendant negligent. The precise relationship between the defendant and the "house officer" was not disclosed by the record but an inference was warranted, in the opinion of the court, that it was the latter's duty to administer to patients such treatment as the defendant directed. There was nothing in the record to indicate that the defendant had anything to do with the outpatient department or had any supervision over treatment there given to patients. The patient contended that the defendant was negligent in not discovering and removing from the wound, at the time of the examination, the bit of wool fabric which was removed several months later. If the testimony of the defendant were accepted, the court said, there was adequate reason for not ascertaining at that time whether any foreign matter was in the wound, and the course followed by the defendant of awaiting the partial healing of the wound and the formation of a sinus was prudent and proper. If his testimony were rejected, there was no expert testimony on which to base a finding that the conduct of the defendant was improper.

The fact that pus appears in a wound which is being treated by a physician does not warrant the finding that he was negligent; infection may arise regardless of the care used by the attending physician. There was here no evidence that the pus was seen before the patient left the hospital on January 14. There was no evidence of any specific act of the defendant or of the "house officer" that introduced any septic matter into the wound. The inference was warranted, the court continued, that foreign matter caused the appearance of pus but not at a time when the defendant was treating the patient or was supervising his treatment. Pus appeared while the patient was being treated in the outpatient department. The defendant had nothing to do with that department.

Since the evidence in the case did not warrant the submission of the case to the jury, judgment was entered for the defendant.—*Tallon v. Spellman (Mass.)*, 19 N. E. (2d) 33.

Accident Insurance: Death from Chloral and Bromide Poisoning as Accidental.—The insurance company promised to pay to the beneficiary certain benefits if the insured died from bodily injuries effected directly and independently of all other causes through external, violent and accidental means which produced a visible contusion or wound on the exterior of the body. The insured died as a result of taking a medicinal compound containing cannabis, chloral hydrate, potassium bromide and extract of hyoscyamus. The company refused to pay the benefits and the beneficiary sued and obtained judgment in the trial court. The company then appealed to the court of appeals of Tennessee, western section.

The insured was so constituted physically that a comparatively small quantity of intoxicating liquor, while not making him drunk, would result in his being rendered highly nervous after the effect had worn off. To relieve this condition, which occurred at irregular periods only, he was accustomed to taking the medicine described, which he procured at a drug store without a physician's prescription. On the evening of Nov. 27, 1936, the insured had several drinks of gin and beer. He was not rendered noticeably intoxicated but nevertheless was so nervous the following day that he remained in bed. That night his wife telephoned to a neighborhood drug store and ordered some of the medicine. A 2 ounce (60 cc.) bottle of it was sent, with directions written on it to take "two teaspoonsful as needed." The insured was given a dose at 7:30 p. m. and another dose of 2 teaspoonfuls about midnight. He apparently took some more of the medicine about 12 noon of the following day and another dose of 2 teaspoonfuls about 3 o'clock. About 6:30 p. m. his wife noticed that he had a peculiar look about his eyes—that his eyes "looked kind of glassy"—and called in a friend of the family. Shortly after the arrival of this friend, the insured took another dose of the medicine (just how much does not appear in the record), staggered back to his bed, lay down on it and went into a deep sleep. A physician was immediately summoned and found the insured in a serious condition. "He had a pallor and his pulse was thready and weak, respiration shallow." The insured was immediately taken in an ambulance to a hospital where his

stomach was washed out and he was given cathartics and epinephrine. He died while on the emergency table, death being attributed to chloral and bromide poisoning resulting from the cumulative effect of the medicine.

The insurance company, in refusing to pay the benefits, insisted that the death was the natural result of an act in which the insured intentionally engaged and that therefore it was not accidental. The appellate court, however, was unable to agree to the contention that the insured actually took what he intended to take. True, the court said, he intended to take the identical liquid which he took, and it may be in precisely the quantity intended. It was clear to the court, however, that in so doing he meant to take a harmless "nerve remedy" and, based on his previous experience, thought that was what he was doing, whereas what he in fact took, instead of being harmless, was poisonous in the quantities taken. His ignorance of this fact introduced an entirely unforeseen and unexpected element into an act which was in other respects intentional, and hence rendered it "accidental."

The insurance company further contended that there was no proof of a visible contusion or wound on the exterior of the insured's body evidencing the injury that caused his death and hence recovery was not warranted even though the injury was effected by accidental means. The beneficiary insisted that the evidence was sufficient to meet the requirements of the policy, stressing the facts that when the insured staggered to the bed after taking the last dose of the medicine he lay down "and went into a deep sleep and his mouth flew open and he snored," that his features were "very white" and that "his head was drawn back." The words "contusion" and "wound," said the court, are of well known, commonly understood import which must be given effect. To the court there was no reasonable basis for the view that a pallid face and drawn head are within that meaning.

The judgment of the trial court for the plaintiff was therefore reversed and the case remanded for a new trial.—*Travelers Ins. Co. v. Ansley (Tenn.)*, 124 S. W. (2d) 37.

Optometry: Duty of Optometrist to Detect Disease of Eye; Liability of Corporate Employer of Optometrist.

—The defendant jewelry and optical corporation operated a department, in charge of a licensed optometrist, wherein the eyes of customers could be examined and glasses prescribed. The plaintiff's eyes had been hurting her for some time and on seeing the defendant's advertisement in a newspaper, she visited the optometrist in charge of the department, May 17, 1935. The optometrist examined her eyes and prescribed lenses which, however, failed to relieve the condition. On several occasions, according to the testimony introduced on her behalf, she returned to the optometrist and complained that the glasses caused her eyes to hurt and each time she was assured that the glasses would remedy her ailment when she became used to wearing them. On November 2 the plaintiff returned again to the optometrist and complained that she could not see out of one of her eyes. An examination by the optometrist disclosed that the sight of her right eye was completely gone and he then advised her to see a physician. The physician whom she consulted discovered that she was suffering from glaucoma, which had caused a detached retina of her right eye and which was at that time affecting her left eye. Subsequently her right eye was removed and her left eye treated in order to save it. She then brought suit against the corporation and the optometrist. Before the case was given to the jury, however, the case against the optometrist was dismissed and thereafter the trial court gave judgment for the defendant corporation. The plaintiff appealed to the Supreme Court of Alabama.

The first question discussed by the court was whether the relationship of master and servant existed between the corporation and the optometrist. When an optometrist undertakes to make an examination of the eyes, the court said, with a view of determining whether glasses will be of aid to his patient, he must exercise his professional or scientific skill, knowledge and judgment and he cannot be directed by an employer who has no such knowledge. But this does not mean that the employer, whose business the optometrist is conducting, is not answerable for the negligence of the optometrist

resulting in injury to a third person, who has gone to the employer's place of business for an examination of her eyes and to be fitted with glasses. It was the defendant's business, under the control of its optometrist, it is true, but the defendant undertook for a pecuniary reward to render competent and proper optometric services. For all practical purposes, the defendant was engaged in rendering optometric service to the public. The defendant cannot, therefore, escape liability because of the independent character of the agent's or servant's business. The defendant was bound to see that those who sought examination of their eyes and the fitting of glasses received proper attention and service, and for any injury or damage to the defendant's customers, proximately caused by the want of skill or negligence of the optometrist, it, the defendant, is liable.

After reviewing several definitions of optometry, the court concluded that the optometrist in this case was not required, or even authorized, to diagnose and treat diseases of the eye. The optometry act of Alabama prohibits any optometrist from administering drugs in any form, from practicing, or claiming to practice, medicine or surgery in any sense, or from using any title or appellation intended or calculated to indicate the practice of medicine or surgery. Clearly, the court said, the duty resting on the optometrist was to examine the plaintiff's eyes for the "purpose of ascertaining any departure from normal (having reference to vision), measuring its functional powers, and adapting mechanical means for the aid thereof." If, however, in the performance of those duties, it would be apparent to a skilful optometrist that there existed in the eye a disease or malformation, the court inferred that it would be the optometrist's duty so to advise his patient in order that the proper medical or surgical treatment might be had. The evidence in this case, however, convinced the court that the disease of the plaintiff's eyes was not such a disease as should have been detected by a skilful optometrist. The corporation's optometrist, therefore, was not negligent in failing to detect it.

Since there was no breach of duty owed by the corporation to the plaintiff, the judgment for the defendant corporation was affirmed.—*Hampton v. Brackin's Jewelry & Optical Co., Inc. (Ala.)*, 186 So. 173.

Privileged Communications: Wife of Physician Who Acts as Assistant Within Rule.—Where a statute, said the criminal court of appeals of Oklahoma, provides that a physician or surgeon shall be incompetent to testify as to any communication made to him by his patients with reference to any physical or supposed physical disease, or any knowledge obtained by a personal examination of any such patient, the same rule applies to the wife of the physician or surgeon who is his assistant in his office and by reason thereof hears the communication or sees the examination.—*Williams v. State (Okla.)*, 86 P. (2d) 1015.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otolological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Western Section, American Laryngological, Rhinological and Otolological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.
- Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

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AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

- 18: 389-518 (Oct.) 1939
Formation and Movements of Lymph. C. K. Drinker, Boston.—p. 389.
Coronary Arteries of the Dog. M. B. Pianetto, Rosario, Argentina.—p. 403.
Hypertonic Glucose Solution in Angina Pectoris. D. Scherb and J. Weissberg, New York.—p. 411.
Deproteinized Pancreatic Extract (Depropanex): I. Effect in Treatment of Intermittent Claudication Due to Arteriosclerosis Obliterans. M. M. Fisher, A. W. Duryee and I. S. Wright, New York.—p. 425.
Activities Associated with Onset of Acute Coronary Artery Occlusion. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 434.
Convallan in Cardiac Therapy. R. H. Major and L. H. Leger, Kansas City, Kan.—p. 444.
Capillary Rupture with Intimal Hemorrhage as Cause of Pulmonary Thrombosis. J. C. Paterson, Ottawa, Ontario, Canada.—p. 451.
Electrocardiographic Changes Associated with Experimental Alterations in Blood Potassium in Cats. F. L. Chamberlain, J. Scudder and R. L. Zwemer, New York.—p. 458.
Ruptured Popliteal Aneurysm: Report of Four Cases. W. M. Yater, Washington, D. C.—p. 471.
Loud, Musical, Diastolic Murmurs of Aortic Insufficiency: Clinical and Pathologic Observations on Their Cause and Mechanism of Their Production. S. Bellef, B. Gouley, C. F. Nichols and T. M. McMillan, Philadelphia.—p. 483.

Activities Associated with Onset of Coronary Occlusion.—In this paper Master and his associates offer evidence at occlusion of the coronary artery occurs irrespective of physical activity. They analyzed 1,440 attacks of coronary preceding the attacks, the time of day when the attacks occurred, the patients' occupations and other associated factors. The distribution of occupations was approximately the same as that in the general population; therefore occupation and social status did not predispose to coronary occlusion. The circumstances preceding the onset of symptoms in 890 cases were sleep 22.3 per cent, rest 31.1 per cent, mild activity 20.2 per cent, moderate activity 8.5 per cent, walking 15.8 per cent and unusual exertion 2 per cent. Correlation of these percentages with the number of hours spent daily by the ordinary person in the same occupations indicated that the circumstances were coincidental and that none of them was causally related to the coronary occlusion. Thus coronary occlusion occurs irrespective of the state of physical activity of the body. Associated factors in 930 cases were meals 9.9 per cent, emotional excitement 5.6 per cent, surgical operation 6.6 per cent, infection 4.3 per cent and miscellaneous factors 1 per cent. It was concluded that, with the possible exception of surgical procedures, these factors did not play a role in the pathogenesis of coronary occlusion. Only two attacks of coronary occlusion were associated with trauma. Detailed histories of the activities and emotional state of patients for hours, days and weeks preceding attacks confirm the belief that physical activity and excitement are not factors in the onset of coronary occlusion. Sixty patients sustained an attack of coronary occlusion after having been bedridden for weeks or months. The time of onset was ascertained in 722 cases. Equal numbers occurred during the afternoon, evening and night and were distributed throughout all the hours of the day, with attacks at 2 a. m. and 10 p. m. This also indicates that activity is not a factor in the precipitation of coronary occlusion. Premonitory symptoms of the attack, such as pain in the chest, dyspnea or weakness were present in eighty of 170 cases. There is no evidence that physical effort or excitement produces intimal hemorrhage in the coronary arteries, which is the usual forerunner of thrombosis and occlusion. Intimal hemorrhage is the end result of the progressive, degenerative arteriosclerotic process and is probably a fortuitous event. It was found at necropsy as frequently in patients who had been bedridden prior to the occlusion as in those who were physically active.

American Journal of Pathology, Boston

- 15: 501-656 (Sept.) 1939
Occurrence of Virulent Tubercle Bacilli in Presumably Nontuberculous Lung Tissue. W. H. Feldman and A. H. Baggenstoss, Rochester, Minn.—p. 501.
Fixing and Staining Methods for Lead and Copper in Tissues. F. B. Mallory and F. Parker Jr., Boston.—p. 517.
Giant Cell Formation in Tonsils in Prodromal Stage of Chickenpox: Report of Case. T. H. Tomlinson Jr., Washington, D. C.—p. 523.
Traumatic Autotransplantation of Splenic Tissue. S. Jarcho and Dorothy H. Andersen, New York.—p. 527.
Comparison of Effects of Anterior Pituitary Hormone on Skeletal Tissues of Young and Mature Guinea Pigs. M. Silberberg and Ruth Silberberg, St. Louis.—p. 547.
Intracellular Bacilli in Intestinal and Mesenteric Lesions of Typhoid Fever. J. W. Adams Jr., Nashville, Tenn.—p. 561.
*Carcinoma of Lung: Analysis of Seventy-Four Autopsies. R. D'Aunoy, B. Pearson and B. Halpert, New Orleans.—p. 567.

Carcinoma of Lung.—D'Aunoy and his associates state that seventy-four cases of primary carcinoma of the lung were encountered in 6,623 necropsies on persons more than 1 year of age. Sixty-eight of the growths occurred in men and six in women. The age range was from 21 to 75 years. The average duration of illness was five months. One patient died in the third, four in the fourth, thirteen in the fifth, thirty-three in the sixth, nineteen in the seventh and four in the eighth decade of life. In almost half of the cases the primary growth was located in one or the other bronchus. Thirty-seven of the seventy-four carcinomas were composed of squamous cells, twenty-one of reserve cells and sixteen of columnar cells. The problem is emphasized by many recent publications. There is an apparently wide variance in the conceptions of individual authors as to the histogenesis and structure of carcinoma of the lung as no uniformity has yet been attained in classifying these growths. The difficulty may be superficial rather than essential. In the authors' opinion a classification on a histogenetic basis, combined with a nomenclature derived from the cell making up the growth, rather than from the structure which the cell forms, will go far toward simplifying the problem. The occasional overlapping of groups is not unexpected, since all carcinomas of the lung, they believe, are derived from a common ancestor cell, the reserve cell.

American Journal of Physiology, Baltimore

- 127: 415-604 (Oct.) 1939. Partial Index
Adrenalin Lactacidemia: Proportionality with Dose. F. R. Griffith Jr., Julia E. Lockwood and F. E. Emery, Buffalo.—p. 415.
Factors Affecting Toxicity of Potassium. A. W. Winkler, H. E. Hoff and P. K. Smith, New Haven, Conn.—p. 430.
Range and Variability of Blood Flow in Human Fingers and Vasomotor Regulation of Body Temperature. A. C. Burton, Philadelphia.—p. 437.
Radiating Power of Human Skin in Infra-Red. J. D. Hardy, New York.—p. 454.
Influence of Hypophysis on Carbohydrate Metabolism. S. Soskin, R. Levine and W. Lehmann, Chicago.—p. 463.
Motility of School Children During Sleep. G. Giddings, Emory University, Ga.—p. 480.
Influence of Air Movement on Heat Losses from Clothed Human Body. C.-E. A. Winslow, A. P. Gage and L. P. Herrington, New Haven, Conn.—p. 505.
Effect of Subcutaneous Administration of Water and Certain Salts on Urine Volume. A. M. Walker, Philadelphia.—p. 541.
Role of Pituitary in Calorigenic Action of Vitamin D. A. Bartoli, J. Feldman and C. I. Reed, Chicago.—p. 552.
*Effect of Posture on Peripheral Circulation. M. Nielsen, Copenhagen, Denmark; L. P. Herrington and C.-E. A. Winslow, New Haven, Conn.—p. 573.
Measurement of Insulin Action. D. R. Drury and P. O. Greeley, Los Angeles.—p. 581.

Effect of Posture on Peripheral Circulation.—Nielsen and his co-workers report that a passive change of body posture by a tilting from the horizontal to a feet down position (45 degrees from the horizontal) produces a peripheral vasoconstriction in subjects not adapted to warm environments. The degree of vasoconstriction increases with progressively warmer environments and higher angles of tilting. Higher angles of tilting or extremely hot environments are associated with a tendency to collapse. A rise of internal body temperature, roughly proportional to the degree of vasoconstriction, occurs in the vertical position and may be functionally associated with the stimulus to increased evaporation. The disturbance of the heat-regulatory function due to vasoconstriction in the tilted position is, to a certain degree, compensated by an increase in evaporation. Except under severe conditions, toe temperatures change in an opposite direction to general cutaneous temperatures, possibly involving a protective mechanism against local chilling.

American Journal of Surgery, New York

46:1-218 (Oct.) 1939. Partial Index

- Neoplasms of Cecum and Ascending Colon. F. H. Lahey, Boston.—p. 3.
Surgical Removal of Lesions Occurring in Sigmoid and Rectosigmoid.
C. F. Dixon, Rochester, Minn.—p. 12.
Cancer of Rectum and Rectosigmoid: Diagnosis and Treatment. F. W.
Rankin and A. S. Graham, Lexington, Ky.—p. 18.
Operability and Types of Surgery in Cancer of Rectum. T. E. Jones,
Cleveland.—p. 45.
*Immunization of Peritoneum. F. A. Collier and S. Rife, Ann Arbor,
Mich.—p. 61.
Water and Chemical Balance in Surgery of Colon. T. G. Orr, Kansas
City, Kan.—p. 70.
Surgical Management of Chronic Intractable Ulcerative Colitis. H. W.
Cave, New York.—p. 79.
Gastrojejunoileocolic Ulcer and Fistula. W. Walters and O. T. Clagett,
Rochester, Minn.—p. 94.
Operability, Morbidity and Mortality Factors in Carcinoma of Colon.
A. Ochsner and M. DeBakey, New Orleans.—p. 103.
Diagnostic Value of Sigmoidoscopy and Biopsy. F. C. Yeomans, New
York.—p. 123.
Injuries of Colon: Review of Sixty-Two Cases in Negro Patients. F. K.
Boland, Atlanta, Ga.—p. 126.
Lymphatic Distribution of Colon and Rectum. W. W. Looney, Dallas,
Texas.—p. 143.
Treatment and Prognosis of Diverticulitis of Colon. P. W. Brown,
Rochester, Minn.—p. 162.
*Malignant Disease of Colon: Factors Influencing Operability, Morbidity
and Mortality. A. W. Allen and C. E. Welch, Boston.—p. 171.
Experiences with Resection of Colon and Elimination of Colostomy.
W. W. Babcock, Philadelphia.—p. 186.
Multiple Polyposis: Congenital, Heredofamilial, Malignant. D. C.
McKenney, Buffalo.—p. 204.

Immunization of Peritoneum.—Collier and Rife point out that during the last ten years three immunizing agents have been employed extensively for immunization of the peritoneum. These are (1) the vaccine developed by Steinberg and Goldblatt, (2) the vaccine prepared by Bargen and (3) the amniotic fluid preparations originally suggested by Johnson. Such factors as the species of laboratory animal used, the type and dose of immunizing substance employed and the time and mode of its administration make it difficult to compare the observations of one investigator with those of another. It is logical to assume that the peritoneum of one animal will not react in the same manner as that of another, and the peritoneums of animals will all differ in some respects from that of man. As yet no adequate control series has been reported. From a clinical point of view, the newer concept of the protective value of the exudate in peritonitis has a practical value. In operations done on patients with peritonitis it would seem harmful to carry out manipulations designed to wipe or wash away exudate that is part of a protective mechanism against the infection. If free exudate is removed it must be done in the gentlest fashion, by careful aspiration. The authors can see no reason for the routine use of any of the substances suggested to increase the immunity of the peritoneum. If patients are properly prepared for operation and if the operation is carried out with careful meticulous technic, peritonitis rarely supervenes. Some substance that will produce rapid local leukocytosis is of value in those instances in which, because of accident of operation or disease, the large intestine is opened. The authors' experience in these circumstances has been most satisfactory with colibactragen (Steinberg). They feel that it has a distinct value when used in the stage of contamination and that it has little or no value once the infection is established. Postoperative peritonitis in cases previously without infection is usually due to errors of operative technic that cannot be corrected by the introduction into the peritoneum of anything except better surgical technic.

Malignant Disease of Colon.—Allen and Welch reviewed 634 patients with cancer of the colon admitted to the Massachusetts General Hospital from 1925 to 1938 inclusive. Of these, in 365 the colon was resectable. This operability can be increased only by earlier diagnosis and by abandonment of the idea that the disease is incurable or that the patient cannot stand the operation. Many times help is denied until obstruction sets in or the patient becomes moribund from perforation or hopeless extension of the disease. In considering the various locations of cancer of the colon and the operative procedures giving the most satisfactory outcome, the authors state that each surgeon must adopt the method that gives him the best result. Gross contamination of the peritoneal cavity must be avoided. The diseased area must be removed and, in most instances, continuity of the intestine reestablished. The blood supply to the anastomosed ends must be preserved. Sutures must approximate the serous coats of the intestine, and the mucous membrane

must be inverted. There must be no tension on the suture line and no drains resting near it. Traps in the mesentery must be closed and raw surfaces peritonized when possible. Proximal complementary decompression must be established if not provided by a previous procedure. If to these rules good general surgical principles are added the results will be satisfactory. The authors have found that two stage procedures have lowered their mortality. They believe preliminary proximal operations should be done routinely for malignant lesions of the large intestine whether obstruction does or does not exist, and regardless of the age or condition of the patient. Too many "good risk" patients have succumbed to one stage operations on the intestine. The hospital stay of the patient operated on in two stages for cancer of the colon is increased on an average of ten days, but the fatal complications of peritonitis and pneumonia are materially reduced. The mortality from radical operation was approximately 20 per cent in one stage procedures as compared with 13 per cent in the two stage operations.

Archives of Neurology and Psychiatry, Chicago

42:789-978 (Nov.) 1939

- Involvement of Nervous System Associated with Endocarditis: Neuropsychiatric and Neuropathologic Observations in Forty-Two Cases of Fatal Outcome. J. W. Kernohan, H. W. Woltman and Arlie R. Barnes, Rochester, Minn.—p. 789.
Subdural Shadows in Pneumoencephalograms: Their Diagnosis, Origin and Significance. T. J. C. Von Storch and A. Buernmann, Boston.—p. 810.
Effect of Epinephrine on Convulsions. E. Gellhorn, C. W. Darrow and L. Yesinick, Chicago.—p. 826.
*Role of Allergy in Multiple Sclerosis: Incidence of Atopy in Series of Forty Cases. R. L. Baer and M. B. Sulzberger, New York.—p. 837.
Gross Pathology of Oligodendrogliomas. K. Löwenberg and R. W. Waggoner, Ann Arbor, Mich.—p. 842.
Rhythmic Variation of Respiratory Excursion with Bilateral Injury of Cortical Efferent Fibers. R. V. Grimmer, F. H. Hesser and O. R. Langworthy, Baltimore.—p. 862.
Human Pyramidal Tract: Fiber and Numerical Analysis. A. M. Lassek and G. L. Rasmussen, Charleston, S. C.—p. 872.
*Follow-Up Study of Five Hundred Patients with Schizophrenia Admitted to Hospital from 1913 to 1923. T. A. C. Rennie, with the help of J. B. Fowler, Baltimore.—p. 877.
Pinealoma of Diffuse Ependymal Origin. R. P. Mackay, Chicago.—p. 892.
Hemorrhages into Central Nervous System Following Lumbar Spinal Puncture. S. Androp, Catonsville, Md.—p. 903.
Classroom Outline for Pathologic Diagnosis of Primary Intracranial Neoplasms: Six Differential Characteristics. L. Alexander, Boston.—p. 912.

Allergy in Multiple Sclerosis.—Baer and Sulzberger undertook to study patients with multiple sclerosis in order to determine how many had an atopic hypersensitivity. This type of allergy, which is clinically represented by asthma, hay fever and atopic dermatitis, is characterized chiefly by (1) a high incidence of atopic conditions in the familial as well as in the personal history, (2) wheal responses to scratch and intradermal tests with the protein fractions of foods, inhalants and other materials, (3) eosinophilia in the blood and (4) frequent observation of passive transfer antibodies or reagins (Prausnitz-Küstner reaction). Atopy is only one of many characteristic forms of allergy known to appear in man (others are, for example, contact allergy, tuberculin allergy and various forms of drug allergy). The authors made their studies on forty patients with multiple sclerosis. On all forty patients, scratch tests were made with from sixty-four to seventy common food allergens and with thirty-four common inhalant and other allergens. Histories of thirty of the forty patients were taken with regard to the familial and personal incidence of atopic conditions, the ingestion of drugs and exposure to occupational as well as other environmental substances prior to the onset of the disease. From the remaining ten patients no exact histories could be obtained. Of the thirty patients with multiple sclerosis who were completely studied, ten, or 33 per cent, presented evidence of personal or familial atopic disease or positive wheal reactions to skin tests or both. When these figures are compared with those in the literature relating to the incidence of atopy in an unselected population, it will be seen that these results correspond with the high average values submitted by investigators who have performed similar studies on unselected groups. The authors conclude therefore that, with the criteria and methods described and with allowance for the factor of error present in a series of this small size, their results in the forty cases of multiple sclerosis do not demonstrate a significant increase over the normal incidence of atopy. This statement does not, of course,

elude the possibility that in an occasional instance multiple sclerosis-like symptoms may be caused by an atopic mechanism. Nor do these results in any way preclude the possibility that some nonatopic form of allergy may play a role in multiple sclerosis.

Follow-Up Study of Patients with Schizophrenia.—Rennie studied 500 patients exhibiting a typical picture of parergastic disorder, commonly designated as schizophrenia or dementia praecox. This group is made up of the patients admitted between May 1913 and May 1923. Of the 500 cases selected for the study, the author has been unable to get adequate facts in only forty-four. Concerning 456 patients he has some statement of the course of the disease, ranging from one to twenty-six years after hospitalization. The method of follow-up study employed was to trace the patient's present status by the use of a letter of inquiry to the patient, relatives or family physician; a personal interview by a staff member, or an interview with the patient or family by a social worker employed for this project. A number of patients were followed by all three methods. In discussing the results of this investigation, the author says that at the time of discharge from the clinic 42.7 per cent were well or improved, whereas 57.3 per cent left the hospital unimproved. The course of the illness seems more favorable for women than for men. At the end of twenty years the picture is less favorable than at the end of nine years or at the time of discharge. After twenty years, 27 per cent of the patients show recovery; an additional 13 per cent give evidence of some productivity. There is great variability in the course of the disorder as regards rehospitalization; 33.5 per cent of the total series of patients were never able to leave a hospital; 32.6 per cent were never readmitted to any hospital. While rehospitalization is frequent, this does not necessarily affect the final outcome. For the majority of the patients who recover a single brief period of hospitalization is the rule. There are exceptions to this, in that one fourth of the total number had a period of readmission to a hospital. One patient, after ten years of psychotic behavior in a hospital, appears to have been completely recovered for eight years. Another patient, after eight years of hospitalization, appears to have been completely recovered for fourteen years. In a few other cases there have been as many as five hospitalizations before recovery was effected. Thus, a second or even a third or fourth hospitalization does not necessarily spell poor prognosis. Nonetheless, it is striking that the period of hospitalization for the recovered group is for the most part less than a year. In marked contrast to the relatively brief period of hospitalization and to the single admission of the majority of the recovered patients are the observations on the group of permanently hospitalized patients. For the most part these persons show a protracted and uninterrupted period of hospitalization. However, gaps of time between the first and the permanent hospitalization occur with 35 per cent of the group. Permanent recovery is difficult to predict, even after long years of apparent well-being. These observations tend to reemphasize the fact that extreme caution must be exercised in offering prognosis in cases of schizophrenia.

Archives of Pathology, Chicago

28: 427-612 (Oct.) 1939

Transposition of Great Cardiac Vessels, with Special Reference to Phylogenetic Theory of Spitzer. J. S. Harris, Durham, N. C., and S. Farber, Boston.—p. 427.

*Vitamin C Deficiency and Intestinal Fusospirochetosis. F. M. Woolsey and J. R. Black, Durham, N. C.—p. 503.

Organic Lesions Produced by Polyvinyl Alcohol in Rats and Rabbits: Toxicopathologic Investigation of Experimental Thesauriosis. W. C. Hueper, New York.—p. 510.

Cultivation of Viruses: Critical Review. M. Sanders, New York.—p. 541.

Ascorbic Acid Deficiency and Intestinal Fusospirochetosis.—According to Woolsey and Black, a microscopic study of sections of intestines obtained at necropsy in twenty-four cases of intestinal disease (including diphtheritic and ulcerative colitis, typhoid, dysentery due to Flexner's bacillus and enteritis due to Giardia and Ascaris) revealed fusiform bacilli in twelve instances. In only two of these were Levaditi stains available, and in these spirochetes were seen. In all but two of the twelve cases in which fusiform bacilli were found there were infections which could have caused a break in the intestinal mucosa. All of these patients had been on a diet deficient in

ascorbic acid. This type of diet lowers the resistance of the intestines to infections. The manner in which this resistance is lowered is probably complex, but the authors' experiments on animals receiving a diet deficient in ascorbic acid showed numerous small hemorrhages in the intestines, indicating that at times these hemorrhages are sufficiently profuse to cause necrosis and thus a break in the mucosa which allows the organisms present to gain a foothold. What part this mechanism plays in clinical cases is difficult to evaluate. The evidence of other causes at necropsy does not preclude the possibility that some agent other than the ascorbic acid deficiency may have been present before the fusospirochetal infection. However, the work of Koch indicates that extreme ascorbic acid deficiency leads to definite intestinal lesions with fusospirochetes present. When a break in the mucosa of the intestines is caused by parasites, bacteria or a deficiency of ascorbic acid fusospirochetal organisms, if present, may cause further damage. However, at present there is no indication that the intestines can be damaged by fusospirochetes without the aid of some other factor.

Canadian Medical Association Journal, Montreal

41: 323-428 (Oct.) 1939. Partial Index

Disseminated Blastomycosis: Case. L. J. Solway, M. Kohan and H. G. Pritzker, Toronto.—p. 331.

A Mold from the Ear. Eleanor Silver Dowding and M. R. Levey, Edmonton, Alta.—p. 336.

Renal Hypoplasia with Pyelitis Cystica and Ureteritis Cystica. D. W. MacKenzie and H. J. Tweddell, Montreal.—p. 345.

Iodine Deficiency in Relation to Stillbirth Problem. W. N. Kemp, Hampstead, Que.—p. 356.

Lobar Pneumonia. L. C. Montgomery and S. L. Richardson, Montreal.—p. 362.

Diagnosis and Treatment of Neurotic Disorders. E. P. Lewis and D. G. McKerracher, Toronto.—p. 366.

Treatment of Severe Cases and Complications of Varicose Veins in Legs. I. D. Kitchen, Toronto.—p. 374.

Peripheral Vascular Complications in Prostatic Surgery. A. Strasberg, Montreal.—p. 377.

Artificial Pneumothorax (Five Year Report). S. J. Hawkins and E. N. Coultas, Kitchener, Ont.—p. 379.

Prenatal Care (Eleven Year Study of Dalhousie University Public Health Centre Prenatal Clinic). A. L. McLean and W. G. Colwell, Halifax, N. S.—p. 382.

Endocrinology, Los Angeles

25: 491-660 (Oct.) 1939. Partial Index

*Studies of Metabolism of Androgens in Women. E. C. Hamblen, R. A. Ross, W. K. Cuyler, Margaret Baptist and Catherine Ashley, Durham, N. C.—p. 491.

*Comparative Study of Effects of Male and Female Sex Hormones on Human Vaginal Smear. N. O. Rothermich, Columbus, Ohio.—p. 520.

Efficiency of Extraction and Separation of Certain Anterior Pituitary Hormones. A. J. Bergman, O. B. Houchin and C. W. Turner, Columbia, Mo.—p. 547.

Diethylstilbestrol Compared to Estrone in Causing Estrus in Spayed Mice; and in Conjunction with Progesterin in Inducing Sexual Receptivity in Spayed Guinea Pigs. J. A. Leighty and H. J. Wick, Indianapolis.—p. 597.

Inactivation of Endogenous Estrogen by Liver. N. B. Talbot, Cambridge and Boston, Mass.—p. 601.

Role of Pituitary Stalk in Regulation of Anterior Pituitary, with Special Reference to Thyrotropic Hormone. U. U. Uotila, Boston.—p. 605.

Effect of Adaptation to Various Damaging Agents on Female Sex Organs in Rat. H. Selye, Montreal.—p. 615.

Part Played by Age and Female Sex Hormones in Resistance to Infection. D. H. Sprunt, Durham, N. C.—p. 625.

Effects of Proteolytic Enzymes on Purified Gonadotropic Hormones. A. A. Abramowitz and F. L. Hisaw, Cambridge, Mass.—p. 633.

Metabolism of Androgens in Women.—Hamblen and his colleagues determined the urinary androgens, by a modification of the colorimetric method of Oesting, in a group of twenty-seven women with various levels of ovarian function. In all, 672 twenty-four hour specimens of urine were titrated. Daily titers of the same woman varied markedly. Normal androgenic titers were obtained in five healthy women, aged 21 to 43 years, who experienced cyclic menses; in two women who had had operations involving hysterectomy with ovarian conservation and in five women who had had operations involving hysterectomy and bilateral oophorectomy; in two women, 14½ and 19 years of age, with belated menarches who were staturally and sexually retarded, and in two women, aged 17 and 29 years, who had functional menometrorrhagia associated with various degrees of endometrial proliferation and differentiation. Androgenic titers tended to be high in four women, from 16 to 30 years of age, who had had episodes of amenorrhea, which ranged in duration from four months to five years, and in five women, from 42 to 74 years of age, whose last episodes of uterine bleeding had occurred from nine months to twenty-six years before the

present observation. Injections of testosterone propionate, which varied as to single doses from 10 to 100 mg. and as to number from one to ten, resulted in definite elevations of androgenic titers. The recoveries of the androgen injected ranged from 7.6 to 71 per cent. Intensive estrogenic therapy of two patients caused definite decreases in androgenic titers. From the data reported it is suggested that the chief source of androgens in women is not the ovaries but most likely the adrenals. The complexional coloring and the androgenic titers of women apparently are related. The increased androgenic titers of some women who have periods of amenorrhea may be of diagnostic, prognostic and therapeutic import. An apparently increased production of androgens during the early postmenopausal period may signify the existence of another mechanism for stabilization of pituitary function after ovarian effects have become minimal. The androgens may play an active part in the production of the regressive alterations in the aging sexual system of women.

Effects of Endocrines on Vaginal Smear.—Rothermich endeavored to demonstrate what effect, if any, androgen has on the human vagina as revealed by the vaginal smear. Eleven menopausal women receiving estrogen responded with the typical follicular smear. In eleven similar women treated with testosterone the vaginal smear, if atrophic beforehand, showed no change; if previously follicular in character, the smear regressed to the atrophic type, in which state it persisted. The stimulative effect of estrogen could be entirely nullified by the simultaneous administration of adequate amounts of testosterone. The following conclusions seem indicated: Androgen has no direct stimulating action on the human vagina. Androgen nullifies, counteracts or neutralizes the usual action of estrogen on the human vagina.

Journal of Bone and Joint Surgery, Boston

21: 839-1112 (Oct.) 1939. Partial Index

- Resection of Radial Head and Neck: End-Result Study of Thirteen Cases. B. B. King, New York.—p. 839.
- Methods Used in Handling Epidemic of Poliomyelitis in Ontario in 1937. A. B. LeMesurier, Toronto.—p. 867.
- Etiology of Spondylolisthesis. M. Batts Jr., Ann Arbor, Mich.—p. 879.
- *Use of Insulin as Adjunct in Treatment of Bone and Joint Tuberculosis. R. L. Nichols, Minneapolis, and E. L. Compere, Chicago.—p. 885.
- Treatment of Ununited Fractures of Carpal Navicular. J. M. Edelstein, Johannesburg, South Africa.—p. 902.
- Recurrence of Flexion and Adduction Deformities Following Operative Fusion of Hip and Subtrochanteric Osteotomy. F. H. Downing, Fresno, Calif.—p. 909.
- Functioning False Shoulder Joint Following an Old Dislocation. K. Christophe, Boston.—p. 916.
- Tendon Transplantation: End-Result Study of 458 Transplantations. A. R. Carpenter, Binghamton, N. Y.—p. 921.
- Diagnosis and Treatment of Athetosis and Dystonia. T. J. Putnam, New York.—p. 948.
- Recurrent Luxation of Ulnar Nerve by Congenital Posterior Position of Medial Epicondyle of Humerus. M. S. Burnman and C. J. Sutro, New York.—p. 958.
- Operation for Correction of Hammer Toe. P. W. Lapidus, New York.—p. 977.
- *Orthopedic Treatment of Strümpell-Marie Arthritis. L. T. Swaim, Boston.—p. 983.
- Amputation of Foot, with Calcaneotibial Arthrodesis. H. B. Boyd, Memphis, Tenn.—p. 997.
- *Epiphysitis of Os Calcis. H. E. Simon and B. Williamson, Birmingham, Ala.—p. 1015.
- Fractures of Carpal Navicular: Importance of Special Roentgenography. A. S. Rothberg, New York.—p. 1020.
- Coxa Plana: Report of Two Bilateral Cases in Brothers. W. H. Hagen, East Orange, N. J.—p. 1028.

Insulin in Treatment of Bone and Joint Tuberculosis.

—Because some children suffering from bone and joint tuberculosis cared for in a convalescent home affiliated with the University of Chicago failed to gain in weight insulin therapy was recommended. Nichols and Compere selected fourteen patients with tuberculosis and one with bilateral Legg-Perthes disease, from 3 to 13 years of age, for this adjunct therapy. To each of these patients from 2 to 5 units of insulin was administered twenty minutes before each meal. In each instance the patient manifested more interest in his food. For the first time, some complained that they were hungry. Twelve of the fifteen patients gained from 1 to 3 pounds (0.45 to 1.36 Kg.) in weight. In three of the twelve cases there was no consistent gain in weight until after the injections had been discontinued. There was a simultaneous improvement in the general appearance and well-being of the patients. The authors are not able to postulate conclusions from so few cases. It seems to them that injection of insulin is not indicated as a routine procedure in the treatment of bone and joint tuberculosis except for patients

who are finicky eaters and who, under the best of environmental conditions, fail to gain or actually lose weight.

Orthopedic Treatment of Strümpell-Marie Arthritis.—Swaim reports his results in 106 cases of Strümpell-Marie arthritis observed over twenty-two years. The sacro-iliac joints were fused early in all of the 106 cases. After fusion was complete, the disease stopped. In some cases the hips became fused also. The author's theory has been that ossification represents the result of nature's method of permanent immobilization of the spine to prevent strain and motion and inflammation in the ligaments. Therefore he believes that orthopedic treatment should begin at least within the first three years, although much can be done within nine years. Prior to 1930, forty-five patients had been treated by orthopedic measures in an attempt to prevent the usual deformity of rounded thoracic spine, flat upper part of the chest and buckled body, with protruding head and sometimes with fused hips. The method of correcting posture was as follows: The patient was kept recumbent, and the spine was gradually hyperextended in bed, first by removing the pillows under his head until he was either flat or as straight as possible; second by using plaster half-shells to support and to stretch the spine. Relaxing hot fomentations were applied to the whole spine twice daily for twenty minutes, and corrective exercises to straighten the body and to expand the chest were taught and supervised morning and evening. When the back was as straight as it seemed possible to make it, steel braces which drew the shoulders back were fitted, or short spring braces with elastic shoulder straps were tried; even corsets were used at times to reinforce the braces. Thirty-five of the forty-five patients had completely fused spines, and thirty-one had poor posture in spite of treatment. The results were so unsatisfactory from a postural standpoint that a better method of preventing deformity had to be devised; plaster jackets were tried. It was found that after the patient was completely immobilized in a jacket for several months, motion in the spine was increased rather than lost by the fixation. With the exception of the use of the jacket, no change was made in the previous treatment. If the spine was not straightened by the end of two weeks a jacket was applied and was renewed at regular intervals. The jacket was kept on uninterruptedly for several weeks, until there was no spasm. Then only were new jackets made. Plaster jackets were renewed until the best possible correction was obtained; then a more permanent leather jacket (stepped in back and laced in front) was made on a plaster model. It was cut high in front and low in back and, being waxed, was designed to last for several years. In most cases it was worn day and night. After each plaster jacket was hard a greater lordosis was attempted. Walking was encouraged as the adductor spasm disappeared. The results were encouraging. The spasm and pain disappeared during the first few days, and the general condition improved with the lessened pain and better nights of rest. From the patients' standpoint, the jackets have given the greatest relief to the hips, ribs and neck. From the orthopedic point of view, postural deformity has not occurred, chest expansion has increased and the general health has been better. Sixty-two patients have worn the leather jackets. All became symptomatically better. They were made more comfortable, except three who were uncooperative. All have preferred to wear their jackets rather than to go without them. Conclusions about the physical effects are drawn from twenty-three patients who have worn jackets for from four to nine years. Good posture was maintained in five, improved in fifteen and lost in three; one of these refused the jacket after two years, one cut his jacket in front so that it no longer gave any support and one was uncooperative. No new hip trouble developed in any of the sixty-two cases. Seven of the eleven patients with hip symptoms who wore their jackets from four to nine years became completely symptomless, three patients with fused hips showed no change and one patient was unaccountably worse. Chest expansion decreased in seven cases, was unchanged in two and increased in fourteen. Weight increased in twenty cases, remained the same in two and decreased in one. Sixteen patients are working, six are at home (unemployed but looking for work), and one died of carcinoma of the breast. The study definitely suggests that ossification is much less rapid in patients treated with jackets. The results for such patients were superior to those for the forty-five previously treated without jackets.

Epiphysitis of Os Calcis.—Simon and Williamson warn that in children, particularly in boys, between 7½ and 17 years of age the occurrence of painful heels should suggest the possibility of epiphysitis of the os calcis. The characteristic x-ray observations are fragmentation, rarefaction, narrowing and irregularity in outline of the epiphysis, with later excessive calcification. The condition is self limiting, and recovery occurs spontaneously when the epiphyses unite at about 17 years of age. The etiology has not been definitely established, but the role of trauma seems to be of some significance. Trauma, infection, nutritional disturbances, developmental abnormalities, dislocation in innervation and endocrine imbalance have all been blamed for the condition. It is possible that a combination of several of these factors is sometimes responsible. It is also logical to assume that the cause is not the same in every case. The wearing of sandals, rubber-soled shoes or no shoes at all has been a rather constant observation.

Journal of Infectious Diseases, Chicago

- 65: 97-224 (Sept.-Oct.) 1939. Partial Index
Effect of Sulfanilamide on Shwartzman Phenomenon and on Growth of Meningococci in Vitro. S. S. Schneerson, New York.—p. 97.
Ecto-Enzyme of Clostridium Welchii Which Decomposes Blood Group Specific Substance A. F. Schiff, New York.—p. 127.
Occurrence of Several Unusual Types of Salmonella in Human Infections. F. Schiff and Lotte Strauss, New York.—p. 160.
Nicotinamide and Related Compounds as Essential Growth Substances for Dysentery Bacilli. A. Dorfman, S. A. Koser, H. R. Reames, K. F. Swingle and F. Saunders, Ann Arbor, Mich.—p. 196.
Effect of Alcohol on Chemotactic Response of Leukocytes. R. G. Klepser and W. J. Nungesser, Chicago.—p. 200.
Agglutinins for Bacterium Nephrophorum in Serum of Patients with Chronic Ulcerative Colitis. G. M. Dack, J. B. Kirsner, L. R. Dragstedt and R. Johnson, Chicago.—p. 214.
Intraneural Injections of Serum as Barrier to Migration of Virus in Experimental Poliomyelitis. J. A. Harrison and O. C. Woolpert, Chicago.—p. 214.
Bacillary Dysentery Developing in Monkeys on "Vitamin M" Deficient Diet. Martha Janota and G. M. Dack, Chicago.—p. 219.

Bacterium Nephrophorum Agglutinins in Serum of Colitis Patients.—Dack and his co-workers collected seventy-six specimens of serum from thirty-six patients in different stages of chronic ulcerative colitis. There was a definite correlation of the appearance of Bacterium nephrophorum with the agglutinins for this organism and with the severity of the disease. The severer the disease the greater the ease of isolation of the bacterium and demonstration of nephrophorum agglutinins. The inability to find the organism in certain cases may not mean absence but may represent the technical difficulties encountered in this work. In three patients with chronic ulcerative colitis there were homologous antigens for this serum. In one of these patients the serum reacted only with the homologous strain. In patients with lesions of the colon other than chronic ulcerative colitis agglutinins for one or more of the six antigens studied were found, in some instances in appreciable amount. In general agglutinins were found in higher titer in patients with ulcerating carcinomas of the rectum than in patients with minor lesions of the colon. In thirty-six patients in which the colon appeared normal on proctoscopic examination, Bacterium nephrophorum was not found and agglutinins for three of the antigens were absent from the serum.

Journal of Investigative Dermatology, Baltimore

- 2: 231-300 (Oct.) 1939
Measurement of Hydrogen Ion Concentration of Skin Surface: III. Measurements on Arms of Children with No Apparent Skin Lesions. I. H. Blank, Boston.—p. 231.
Id.: IV. Daily Variations for Adult Females with No Apparent Skin Lesions. I. H. Blank, Boston.—p. 235.
Histology of Intracutaneous Tuberculin Reaction in Human Skin. H. C. Hinshaw and W. H. Feldman, Rochester, Minn.—p. 243.
Tobacco Skin Reactions and Their Clinical Significance. J. Harkavy, New York.—p. 257.
Effect of Fever Artificially Induced on Skin Sensitivity of Guinea Pigs to Turpentine. L. Goldman, Cincinnati.—p. 281.
Mitotic Rhythm in Human Epidermis: Introduction and Review of Literature. Zola K. Cooper, St. Louis.—p. 289.

Cutaneous Reactions to Tobacco.—The incidence of cutaneous reactions to tobacco was studied by Harkavy in (1) 400 normal smokers, male and female, (2) 126 adult female non-smokers, (3) 319 control smokers consisting of forty-seven normal persons and 292 adult patients suffering from various ailments, (4) 140 patients with thrombo-angiitis obliterans, (5) thirty-one patients with peripheral vascular disease associated with arteriosclerosis and (6) 100 patients with coronary disease

and angina pectoris. These studies indicate that positive cutaneous reactions to tobacco (prepared according to a method that the author describes) represent a true immunologic response. This was demonstrated by (1) the presence of tobacco reagins in patients reacting positively, (2) specific absorption of these reagins by corresponding tobacco allergens in patients with multiple sensitization and (3) the induction of a characteristic local eosinophilic reaction in the immediate urticarial response in patients with thrombo-angiitis obliterans, coronary artery disease and migrating phlebitis tested intradermally with tobacco. This is further attested experimentally, in that in about 33 per cent of male rats given daily injections by the intraperitoneal route, with the same tobaccos employed in testing the patients, gangrene of the toes developed. These animals were shown to be sensitized to tobacco by the Schultz-Dale technic. Of the 140 patients with thrombo-angiitis obliterans tested with ragweed and timothy pollen, horse dander and tobacco 68 per cent gave positive reactions to tobacco only of 1 plus and over, and 44 per cent gave plus-minus reactions, making a total of 78 per cent, tobacco only. This is in contrast to 9 per cent of reactions to tobacco only in the 400 normal control smokers. Twelve patients with thrombo-angiitis obliterans tested with nicotine tartrate 1:10,000 and 1:5,000 gave completely negative reactions. Of the 100 patients with coronary artery disease and angina pectoris 44 per cent reacted to tobacco and ten of fourteen had reagins to tobacco. The author infers from these observations that tobacco allergy plays an important part in certain forms of vascular disease as well as in symptoms referable to other systems such as the respiratory, gastrointestinal and cutaneous. The positive reactions assume etiologic significance since they can be correlated with the fact that in the patients studied, particularly in those with thrombo-angiitis obliterans or angina pectoris with or without coronary artery disease, discontinuance of smoking causes an arrest in the progress of the disease and resumption calls forth an exacerbation of all symptoms. Although it has been impossible to adduce any demonstrable proof of sensitization to nicotine as such, the question of hypersensitivity to its alkaloid on theoretic grounds cannot be dismissed completely. Sensitivity to drugs and chemicals may exist irrespective of the pharmacologic action of nicotine in all probability plays an accessory part through its constrictive influence on blood vessels involved. Such a result, common in all smokers, is, however, transitory in normal persons. In itself it evokes no notable symptoms, but it may become of utmost importance in the evolution of pathologic tissue changes in persons allergic to tobacco. In the latter, tobacco hypersensitivity may possibly intensify the pharmacologic action of nicotine. The immunologic and clinical evidence presented suggests that tobacco has an inciting role in thrombo-angiitis obliterans and in certain types of coronary artery involvement.

Journal of Urology, Baltimore

- 42: 481-650 (Oct.) 1939. Partial Index
Affections and Lesions of Prostatic Urethra. E. G. Ballenger, Atlanta, Ga.—p. 481.
Diagnosis and Treatment of Secondary Anaerobic Infections of Kidney Wounds. C. P. Mathé, San Francisco.—p. 488.
Closure of Loin Wound Without Drainage After Nephrectomy for Tuberculosis. E. L. Keyes, New York.—p. 496.
Massive Hydronephrosis Complicated by Hydro-Ureter: Report of Three Cases. W. C. Stirling, Washington, D. C.—p. 520.
*Super Voltage Radiation in Treatment of Bladder Tumors. F. H. Colby, Boston.—p. 538.
Anatomic Origin of Benign Prostatic Enlargement. C. L. Deming and J. S. Wolf, New Haven, Conn.—p. 566.
Obstruction in Neck of Bladder: Criteria of Operability. H. C. Haebein, Rochester, Minn.—p. 581.
*Clinical Significance of Increased Serum "Acid" Phosphatase in Patients with Bone Metastases Secondary to Prostatic Carcinoma. J. N. Robinson, Ethel Benedict Gutman and A. B. Gutman, New York.—p. 602.
Effect of Testosterone on Kidney. H. Selye, Montreal.—p. 602.
Methods of Anesthesia for Transurethral Prostatic Resection and Other Cystoscopic Procedures. E. B. Tuohy and G. J. Thompson, Rochester, Minn.—p. 642.

Radiation for Bladder Tumors.—Colby used the million volt x-ray generator in the treatment of eight malignant bladder tumors. Favorable effects from its use, as with other forms of high voltage therapy, in causing tumor regression have been

evident. Likewise, disappointments have been encountered in other tumors, which seem to be "radioresistant." Patients seem to tolerate this high voltage and short wavelength, showing less general reaction, x-ray sickness and cutaneous change than with lower voltages. Screening sufficient to cut out the rays delivered by the 200 kilovolt machine eliminates the destructive effect of the longer waves, so that larger doses with deeper penetration are employed without untoward results. The author considers wide surgical excision the most suitable treatment for malignant tumors of the bladder, and when possible circumscribed growths are removed by operation. He advises supervoltage radiation only when the extent of the tumor renders operation impracticable or other factors make surgical intervention unwise. Usually debilitated patients with extensive disease are irradiated. Although his series is entirely too small for a fair evaluation of this form of treatment he states that certain tumors appear profoundly affected, with considerable regression. Those portions of the tumor which project into the bladder cavity seem to be affected considerably more than those which have extended through the wall of the bladder. Other tumors are affected little, if at all, and are considered "radioresistant." The dosage so far employed is probably considerably less than that which is possible, but more experience is necessary to standardize dosage and determine its ultimate effect.

Increased Serum "Acid" Phosphatase in Carcinoma.—From their experience and from the reports in the literature (forty-four cases in all), Robinson and his colleagues conclude that increased serum "acid" phosphatase activity is consistent and specific enough in occurrence to be helpful in the differential diagnosis of prostatic carcinoma with skeletal metastases. The determination of serum "acid" phosphatase activity appears to be a useful supplement to the clinical and x-ray study of patients with prostatic carcinoma, particularly if surgical procedures are contemplated. The presence of increased serum "acid" phosphatase activity in patients with prostatic carcinoma implies dissemination of the primary tumor and in this sense has an unfavorable significance; an upward trend in serum "acid" phosphatase values may signify further metastatic involvement. The serum phosphatase activity in sixteen of the nineteen cases of prostatic carcinoma with skeletal metastases that they examined was found to exceed 3 units per hundred cubic centimeters. In thirteen cases of prostatic carcinoma without x-ray evidence of metastases to bone and in six cases of benign prostatic hypertrophy the values were within normal limits.

Military Surgeon, Washington, D. C.

85: 277-364 (Oct.) 1939

- Unification of Medical and Dental Education in Basic Sciences. L. C. Fairbank.—p. 277.
- Role of Aviation Medicine in Development of Aviation (International Review). A. D. Tuttle and H. G. Armstrong.—p. 285.
- Medical Aspects of England's Preparation for Air Attack. D. G. Friend.—p. 301.
- Magnesium Trisilicate: Insoluble Antacid and Absorbent Agent for Treatment of Gastrointestinal Disorders in Soldiers and Others. R. C. Page and E. G. Thomas.—p. 307.
- Designing and Casting Partial Dentures. T. P. Bull.—p. 315.
- Summary of Relation to Aviation of Loss of Intermaxillary Distance. R. A. Lowry.—p. 323.
- Management of Acute Abdominal Emergencies. J. M. Waugh.—p. 329.

New England Journal of Medicine, Boston

221: 515-548 (Oct. 5) 1939

- Social and Economic Situation of Medical Profession in Sweden. J. Waldenström, Uppsala, Sweden.—p. 515.
- Pigment Excretion in Pellagra. A. P. Meiklejohn and R. Kark, Boston.—p. 519.
- Allergic Reaction to Insulin: Report of Case. H. Ulrich, S. B. Hooker and H. H. Smith, Boston.—p. 522.
- Diagnosis of Various Arthritides. W. Bauer, Boston.—p. 524.

221: 549-592 (Oct. 12) 1939

- The United States Marine Hospital, Port of Boston: Massachusetts' Oldest Hospital. J. W. Trask, Chelsea, Mass.—p. 549.
- Treatment of Leukoplakia Buccalis and Related Lesions with Estrogenic Hormone. I. T. Nathanson and D. B. Weisberger, Boston.—p. 556.
- Reciprocal Pharmacologic Effects of Amphetamine (Benzedrine), Sulfate and Barbiturates. A. Myerson, Boston.—p. 561.
- Ventricular Fibrillation as Mechanism of Sudden Death in Patients with Coronary Occlusion. H. Miller, Boston.—p. 564.
- Chemotherapy and Serotherapy of Pneumonia. F. T. Lord, Boston.—p. 570.

New York State Journal of Medicine, New York

39: 1899-2004 (Oct. 15) 1939

- Study of Stillbirth and Neonatal Death Problem: Based on Analysis of All of Rochester's Cases in 1936. H. C. Soule, Rochester.—p. 1905.
- Clinical Experience with Sulfapyridine in Treatment of Lobar Pneumonia. A. Levitt, D. S. Levy and S. J. Jaskiewicz, Buffalo.—p. 1916.
- Physiologic Observations Following Induced Convulsions. L. L. Orenstein, New York.—p. 1921.
- Diagnosis and Treatment of Diabetes: Use of Protamine Zinc Insulin. F. N. Allan, Boston.—p. 1924.
- Induced Pneumothorax and Phrenic Nerve Interruption. B. S. Harwood, Saranac Lake.—p. 1929.
- Fatal Prodromal Measles. S. L. Homrighouse and Thistle M. McKee, Amsterdam.—p. 1934.
- Prevalence of Coronary Artery Occlusion. A. M. Master, H. L. Jaffe and S. Dack, New York.—p. 1937.
- Mild Depressions Cared for by the Family Doctor. Elizabeth I. Adamson, Toledo, Ohio.—p. 1941.
- Acute Cerebral Emergencies. O. C. Perkins, Brooklyn.—p. 1949.
- Deformities of Ear and Nose Treated by Plastic Surgery. G. H. Cox, New York.—p. 1956.
- Experiences with Vaginal Hysterectomy by Clamp Method. M. G. Potter, Buffalo.—p. 1962.
- Weil's Disease: Compensable Infection in New York State. E. Farrell, Brooklyn.—p. 1969.
- Syphilis of Nervous System. R. B. McGraw, New York.—p. 1973.
- Mixed Tumors of Soft Palate. H. Liggett, New York.—p. 1976.

Northwest Medicine, Seattle

38: 363-408 (Oct.) 1939

- Pelvic Endometriosis. G. H. Gardner, Chicago.—p. 367.
- Shock Therapies in Psychoses. C. W. Mack and B. O. Burch, Livermore, Calif.—p. 370.
- *Modified Convulsive Therapy for Involutional Depressive Psychoses. A. W. Hackfield, Seattle, and C. Halvorsen, Steilacoom, Wash.—p. 373.
- Types of Deafness. H. C. Ballenger, Chicago.—p. 375.
- Acute Traumatic Diaphragmatic Hernia. R. Falk and R. S. Smith, Boise, Idaho.—p. 378.
- *Treatment of Botulism: Special Reference to Specific Antitoxin and Respirator from Survey of Sixteen Cases. W. E. Watson, Seattle.—p. 382.
- Thymic Asthma. W. M. Whitehead, Juneau, Alaska.—p. 387.
- Improved Radiographic Technic for Visualizing Odontoid Process. R. Anderson and E. Burgess, Seattle.—p. 388.
- Diagnosis of Syphilis in Neonatal Period. M. L. Bridgeman, Portland, Ore.—p. 389.
- Effect of Bile Salts on Bile Acidity. D. Metheny, Seattle.—p. 390.
- Motor Disturbances of Gastrointestinal Tract. C. E. Hagyard, Seattle.—p. 391.

Modified Convulsive Therapy for Psychoses.—Hackfield and Halvorsen outline a modified form of convulsive therapy (massive dose plus postconvulsive sedation) adapted to the involutional depressive psychoses. The treatment was necessitated by the high incidence of this psychosis in the upper age brackets and as a means of preventing thoracic vertebral fractures and other complications. The modification was used in thirty-six cases. No preliminary preparation of the patient is necessary, and treatment may be given even after the patient has eaten. It promotes a gain in weight, and its relaxing effect facilitates sleep. Restraints are contraindicated, if the patient is placed on his back with the head flat on the bed and a pillow under the midthoracic region, the upper extremities in adduction, flexion and internal rotation and the lower extremities in full extension and adduction. The recommended dose of from 3 to 5 cc. of metrazol is inadequate. In the modified technic for patients with pronounced depressive-stuporous states the initial dose is 7 or 8 cc.; for those with marked apprehensive-agitated features from 10 to 12 cc. is used. With this dosage the subconvulsive reaction is eliminated; when it is encountered, a second administration with an increase of 2 cc. above the initial dose produces a satisfactory convulsion. Immediately after the convulsion 3 or 4 grains (0.2 or 0.26 Gm.) of sodium amytal intravenously or a hypodermic of one-fourth grain (0.016 Gm.) of morphine eliminates postconvulsive anxiety, uncontrolled thrashing during the postconvulsive stupor, nausea, headache and muscle spasm and effects complete amnesia for the treatment. The patient awakens from this sedation in from one-half to two hours, and he is given a hot bath and an alcohol rub. Throughout the treatment psychotherapy is utilized with appropriate emphasis on any apprehensive features regarding the treatment. The number of convulsions (induced every other day) necessary to initiate a remission varies with the psychopathologic features predominating. Patients in a pronounced depressive-stuporous state may respond with a remission after two or three convulsions, whereas those with hypochondriac symptoms predominantly of the anxiety type with delusional elements require on an average of from ten to twelve treatments. The delusional, depressive and hypochondriac features resolve, but psychotherapy

is required for the anxiety-compulsive elements that remain. If in this type of patient the remission is not satisfactory, a rest of a week followed by another course proves more satisfactory than a prolonged series of continued convulsions. A remission was induced in each of twenty-four private patients, but relapses occurred in two cases, in one of which the condition was successfully controlled by further treatment. Of the twelve state hospital patients nine showed remissions, one of whom relapsed, and three showed improvement.

Treatment of Botulism.—From his experience in treating sixteen cases of botulism, with a mortality of 30.25 per cent, Watson feels that botulinus antitoxin is imperative, regardless of the duration of the symptoms or the time elapsed from the ingestion of the toxigenic food, and furthermore that large initial intravenous doses of antitoxin diluted in dextrose-saline solution with epinephrine added should be followed by repeated intramuscular injections. The total quantity of antitoxin should depend on the severity of the intoxication and the apparent clinical response to treatment. The author believes that purified type-specific antitoxin would be preferable to the unpurified mixed antitoxin that he has used. Uncontrollable reactions and serum sickness were not encountered in the sixteen cases. In seven of the patients there developed respiratory paresis, requiring use of the respirator. One of these patients refused to be placed in the respirator and died, four who were in the respirator for varying periods died, and two completely recovered. The impression is that early arrangements should be made for respirators and that the apparatus should be brought to the patient, as his already weakened condition is aggravated by transportation. It appears to the author that the case mortality in botulism should be reduced from its former standard of from 60 to 70 per cent to a level of 30 per cent or less by the early administration of antitoxin and artificial respiration. These patients should be observed closely for clinical evidence of progress of the disease, and severe toxicity manifested by dysarthria, dysphagia, dyspnea, cyanosis, atelectasis or persistent vomiting should be considered a grave prognostic sign.

Ohio State Medical Journal, Columbus

35: 1033-1152 (Oct.) 1939

- Treatment of Nephritis. H. O. Mosenthal, New York.—p. 1049.
Diagnosis of Acute Surgical Abdomen in Children. A. W. Carley, Dayton.—p. 1056.
Regional Iritis. J. W. Holloway, Cleveland.—p. 1059.
Treatment of Gas Gangrene. E. P. McNamee, Cleveland, and C. R. Luenski, New York.—p. 1062.
Functional Sterility in Women. B. B. Rubenstein, Cleveland.—p. 1066.
Tumor Clinic of Cincinnati General Hospital: Record of Its First Decade. W. M. Millar and Minnie Landen, Cincinnati.—p. 1609.
Diagnosis, Prognosis and Treatment of Hodgkin's Disease. C. S. Higley and H. Hauser, Cleveland.—p. 1075.
Midline Cerebellar Tumors. H. E. LeFever, Columbus.—p. 1080.
Muscle Balance in Routine Refractions. F. B. Fralick, Ann Arbor, Mich.—p. 1083.
Psychosomatic Considerations in "Essential" Hypertension. D. M. Palmer, Columbus.—p. 1087.
Role of Cardiac Output in Congestive Heart Failure. J. McGuire, Cincinnati.—p. 1092.

Pennsylvania Medical Journal, Harrisburg

43: 1-112 (Oct.) 1939. Partial Index

- Workmen's Compensation and Occupational Disease Laws in the Commonwealth of Pennsylvania. M. Behrend, Philadelphia.—p. 18.
Abdominal Pain on Locomotion in Rheumatic Disease: Its Significance in the Past Medical History. V. A. Digilio and J. A. Pescatore, Philadelphia.—p. 33.
Aplastic Anemias: Causes, Types and Treatment. J. A. Kolmer, Philadelphia.—p. 36.
*Prevention of Shoulder Dislocations During Convulsive Therapy in Schizophrenia. A. M. Rechtman and N. W. Winkelman, Philadelphia.—p. 39.
Maternal Mortality in a Small General Hospital: Study of the Fifteen Year Period, 1923-1938. F. J. Pearson, Bethlehem.—p. 41.
Some Remarks in Judgment of Blood Bank System for Transfusion. H. Fox, Philadelphia.—p. 49.
Federal Participation in Medical Care: A Suggested Plan. F. A. Riemann, Philadelphia.—p. 51.
Chronic () Relieved by Intravenous Injections of () Hackenstoc, Emmaus.—p. 56.
*Propadrine () of Allergic Manifestations. J. A. Murphy, Philadelphia.—p. 65.
Treatment of Parkinsonian Syndrome. F. M. Forster, Boston.—p. 67.

Prevention of Shoulder Dislocations During Convulsive Therapy.—Rechtman and Winkelman devised a support for preventing dislocations of the shoulder in schizophrenic patients during convulsive attacks induced by metrazol. The support prevents abduction of the shoulder joint during the initial

phase of the convulsive attack when the arms are forcibly and violently abducted. With the use of their belt support they have had no further shoulder dislocations. The support consists of a pelvic band not unlike a polo belt. A pair of wrist cuffs are fastened through loops to the lower strap on the pelvic band. A pair of forearm cuffs are fastened through loops to the canvas belt so as to allow sufficient room for making the injection into the vein at the elbow. The pelvic belt is attached firmly, but not tightly, to the patient before the injection is given. The wrist and forearm cuffs are closed with the arm into which the injection will be made held in supination.

Propadrine for Allergic Manifestations.—Murphy used propadrine (phenyl-propanol-amino-hydrochloride), one of many synthetic compounds offered as a bronchodilator and local vasoconstrictor, in the treatment of approximately 200 patients with bronchial and nasal allergies. Dose for dose the clinical relief closely paralleled that of ephedrine, with untoward side effects definitely less although not entirely absent. The tremor, tachycardia, insomnia, occasional nausea, retention of urine in the elderly man and sense of muscular weakness so frequently observed with the use of ephedrine, necessitating combining it with a sedative, were not evident when propadrine was used. The three-eighths grain (0.024 Gm.) recommended by the distributors of the drug was less satisfactory as a starting dose than three-fourths grain (0.05 Gm.), except in children. Propadrine has not been found efficacious in the severer episodes of asthma and hay fever, but under these conditions, as with ephedrine, it was more apt to aid hay fever than asthma.

Physiological Reviews, Baltimore

19: 439-578 (Oct.) 1939

- Effect of Toxemia on Metabolism. E. Holmes, Cambridge, Mass.—p. 439.
Present Status of Barbiturate Problem. A. L. Tatum, Madison, Wis.—p. 472.
Muscle Hemoglobin. G. A. Millikan, Cambridge, England.—p. 503.
Architecture of Viruses. W. M. Stanley, Princeton, N. J.—p. 524.
Fat Transport in Animal Body. W. R. Bloor, Rochester, N. Y.—p. 557.

Public Health Reports, Washington, D. C.

54: 1807-1846 (Oct. 6) 1939

- Stabilized Method of Forecasting Population. B. D. Karpinos.—p. 1807.
Studies of a Filter-Passing Infectious Agent Isolated from Ticks: V. Further Attempts to Cultivate in Cell Free Mediums: Suggested Classification. H. R. Cox.—p. 1822.
Influence of Transplanted Normal Tissue on Breast Cancer Ratios in Mice. J. J. Bittner.—p. 1827.

54: 1847-1876 (Oct. 13) 1939

- Cultivation of Phase I Haemophilus Pertussis in Semi-Synthetic Liquid Medium. J. W. Hornbrook.—p. 1847.
Development and Genetic Characteristics of Adenomatous Stomach Lesion in Strain I Mice. H. B. Andervont.—p. 1851.
Effects of Extracts of Human Urine on Tumors in Mice. F. C. Turner.—p. 1855.

Review of Gastroenterology, New York

6: 366-453 (Sept.-Oct.) 1939

- Some Differential Diagnostic Problems in Borderlands of Gastro-Enterology and Cardiology. J. S. Rodman and W. G. Leaman Jr., Philadelphia.—p. 366.
Perforated Carcinoma of Stomach Complicated by Streptococcus Sepsis: Case. F. W. Bancroft and H. N. Vermilye, New York.—p. 382.
Value of String Test in Diagnosis of Peptic Ulcers. M. Einhorn, New York.—p. 386.
*Treatment of Duodenal Ulcer with Histaminase: Preliminary Report. J. R. Nakada, St. Louis.—p. 389.
Causes of Poor Results in Operative Treatment for Duodenal Ulcer. H. R. Owen, Philadelphia.—p. 394.
Anemias versus Gastrointestinal Disease. S. A. Loewenberg, Philadelphia.—p. 402.
Surgical Management of Acute Intestinal Obstruction. L. F. Knoepp, Beaumont, Texas, and J. R. Phillips, Houston, Texas.—p. 411.
Intestinal Distention. J. Fine and A. Starr, Boston.—p. 419.
Chronic Ulcerative Colitis Complicated by Carcinoma. M. J. Matzner and G. Schaefer, Brooklyn.—p. 422.
Gastrointestinal Symptoms in Sodium Chloride Privation. B. Jablons, New York.—p. 427.
Conservatism in Surgery of Pancreas. G. W. Papen, Boston.—p. 432.
Red Blood Cells in Obstructive Jaundice. E. Foldes, New York.—p. 438.
*Prognostic Value of Cholesterol Partition Study. D. A. Meiselas, Brooklyn.—p. 441.

Treatment of Duodenal Ulcer with Histaminase.—Nakada treated seven patients who had duodenal ulcer with histamine hydrochloride detoxifying substance or histaminase. The subjective symptoms (pain, nausea, belching and nervousness) were promptly relieved in all the patients. Temporary recurrences of symptoms were due to intercurrent infections in two patients

and to faulty cooperation in two others. However, each improved again on recovery from the intercurrent infection or on resumption of cooperation. Histaminase promises to be of considerable value in the treatment of duodenal ulcer, provided future studies give like results. The method of procedure was to keep the patient on a diet free of condiments, alcohol, fatty or fried foods, dressings, thickened gravies, pastries and excessively sweet foods. Coffee was allowed once a day. Nicotine was reduced as much as possible. One ampule of histaminase (containing 1 detoxicating unit of histamine hydrochloride) was given intramuscularly three times a week and one tablet (containing 5 units) was prescribed three times a day one hour before meals. The patients were usually given one or the other first for a week or two. An additional tablet was taken if the patient awoke at night. The rapidity with which the dosage can be reduced and finally eliminated depends on the progress of the patient. After treatment is discontinued, the patient should be examined clinically and roentgenologically about every six months until all objective evidence has disappeared.

Cholesterol Curve in Liver and Gallbladder Diseases.—Meiselas emphasizes the diagnostic and prognostic value of the cholesterol ester curve in cases of jaundice in determining the severity and likelihood of recovery in liver and gallbladder disease. He does not wish to imply that other laboratory tests of hepatic function should be dispensed with but claims that the cholesterol test should be used as an adjunct to them.

South Carolina Medical Assn. Journal, Greenville

35: 243-268 (Oct.) 1939

- Nonspecific Treatment of Ozena. G. R. Laub, Columbia.—p. 243.
Some Considerations of Wound Healing. W. H. Simmons Jr., Charleston.—p. 248.
Diverticula of Small Intestines. A. E. Baker, Charleston.—p. 250.

Southern Medical Journal, Birmingham, Ala.

32: 983-1076 (Oct.) 1939. Partial Index

- Force Fluids: Evaluation of and Indications for Fluids in Disease. V. E. Simpson, Louisville, Ky.—p. 983.
Widespread Misuse of Endocrine Products in Treatment of Gynecologic Symptoms. G. Penick, Oklahoma City.—p. 994.
Treatment of Infant Vulvovaginitis with Estrogenic Hormone. J. C. Weed and C. G. Collins, New Orleans.—p. 1000.
*Use of Testosterone Propionate in Impotence: Clinical Studies with Male Sex Hormones. III. T. A. C. Rennie, S. A. Vest Jr. and J. E. Howard, Baltimore.—p. 1004.
Treatment of Cancer of Larynx with Comparison of Results Obtained by Surgery and Radiation Therapy. M. F. Arbuckle, St. Louis.—p. 1008.
Hypertensive Factor in Wilms' Tumor. W. E. Daniel, Charlotte, N. C.—p. 1014.
Wilms' Tumors: Embryonal Adenosarcomas of Kidney. L. W. Long, Jackson, Miss.—p. 1016.
Method of Application of Skeletal Traction for Treatment of Contracture of Knee. D. H. O'Donoghue, Oklahoma City.—p. 1023.
Mucoid Carcinoma of Breast. C. E. Gillespie and H. C. Schmeisser, Memphis, Tenn.—p. 1029.
Recent Psychologic Approaches to Patients with Alcohol Problems. R. V. Seliger, Baltimore.—p. 1049.
Protamine Zinc Insulin: Some Reasons for Occasional Dissatisfaction with Its Use. B. F. Keltz, Oklahoma City.—p. 1058.
Pathologic Nasal Conditions Affecting Clinical Allergy. J. S. Agar and A. Cazort, Little Rock, Ark.—p. 1063.

Testosterone Propionate and Impotence.—None of eight patients with psychic impotence that Rennie and his co-workers treated with injections of testosterone propionate reported improvement. No change in symptoms was observed in a male homosexual patient similarly treated. If the factor of suggestion is ruled out it seems unlikely to the authors, in spite of other reports, that in states of psychic impotence specific testis hormones in doses adequate for excellent responses in hypogonadal patients offer any therapeutic help.

Wisconsin Medical Journal, Madison

38: 841-932 (Oct.) 1939

- The Challenge to Medicine. R. G. Arveson, Frederic.—p. 857.
Indigenous Malaria. L. M. Morse, Neillsville.—p. 864.
Ear Injuries. W. E. Grove, Milwaukee.—p. 869.
Simplified Infant Feeding Formula: Report of Use of Irradiated Evaporated Milk and Water in 2,004 Cases. H. O. McMahon, Milwaukee.—p. 874.
Regional Enteritis: Relation of Its Onset, Clinical Course and Pathologic Manifestations to Its Cause. J. A. Bergen, Rochester, Minn.—p. 877.
Transposition of Viscera with Asymptomatic, Arrested Cardiac Development: Case Report. R. E. Garrison, Wisconsin Rapids.—p. 882.
Vaginal and Perineal Trauma. J. W. McGill, Superior.—p. 884.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

1: 249-366 (Oct.) 1939

- Treatment of Rheumatic Diseases in the United States and the Continent of Europe. W. S. Tegner.—p. 249.
Gout an Unsolved Problem. J. B. Burt and R. G. Gordon.—p. 304.
*Effect of Chrysotherapy on Sedimentation Rate in Rheumatoid Arthritis. W. Goldie.—p. 319.
Erythrocyte Sedimentation Test: Wide-Bore Tube Method Using Oxalated Blood and Permitting Correction of Result to Standard Red Cell Volume. D. H. Collins, H. J. Gibson, J. Race and H. B. Salt.—p. 333.
Index of Sedimentation Rate on a Mathematical Basis. L. J. Cutbill.—p. 359

Effect of Gold Therapy on Sedimentation Rate in Arthritis.—Goldie discusses the effect of gold salt therapy on the blood sedimentation rate in 400 cases of rheumatoid arthritis. The patients have been under observation for from six months to four years. The blood sedimentation rate has been determined before and at the end of each course of treatment. On humanitarian grounds a control series has been observed. Gold treatment produced a marked fall in the blood sedimentation rate, and the higher the initial figure the greater the fall. While the initial figure is valueless from a prognostic point of view, the change in the blood sedimentation rate is of definite value. The greater the fall and the lower the final figure, the better, on an average, was the clinical result. The mean fall in the rate was entirely determined by the fall taking place at the end of the first course of treatment. Reduction of dosage should take place after the first course. The blood sedimentation rate was of little value in anticipating either relapse or severe toxic reactions. The most severe upsets occurred in the presence of a normal rate. The utility of the test is thus considerably lessened from a practical point of view.

Archives of Disease in Childhood, London

14: 181-278 (Sept.) 1939

- Oseous Dystrophy Following Icterus Gravis Neonatorum: Generalized Osteitis Fibrosa with Areas of Pigmentation of Skin and Precocious Puberty in the Female. Frances Braid.—p. 181.
Epiphyseal Necrosis in Pituitary Gigantism. E. Traub.—p. 203.
Dysostosis Multiplex: Pfaundler-Hurler Syndrome: Report of Two Cases. D. Engel.—p. 217.
Monocytic Leukemia in Childhood. D. Court and D. G. F. Edward.—p. 231.
Vitamin A Requirements of Infants: Health of Infants Fed on Roller-Process Dried Milk, With and Without a Supplement of Vitamin A. Helen M. M. Mackay.—p. 245.
Review of Twenty Years of Breast Feeding in Liverpool. Margaret Robinson.—p. 259.
Inguinal Hernia in Female Twins, with Special Reference to Identification of Monozygotism. C. E. Kellett.—p. 265.
*Renal Lesions in Children with Erythema Nodosum. A. Wallgren.—p. 271.

Renal Lesions in Erythema Nodosum.—Wallgren encountered three children with erythema nodosum in whom acute hemorrhagic nephritis appeared simultaneously with the cutaneous eruption. All three children were tuberculin sensitive, and it is thought that the tuberculous infection directly or indirectly played a part in the occurrence of the erythema nodosum. In one of the cases pronounced primary pulmonary tuberculosis was present at the same time. Assuming that subclinical renal changes in erythema nodosum might be much more common than can be gathered from the limited number of clinically obvious cases, the author examined by the Addis method the urine of eighty-eight children with erythema nodosum. A pathologic erythrocyturia was demonstrable in about every third or fourth child. After the disappearance of the erythema and the accompanying fever the urine became normal again. The renal lesions occurred in children who did not display the least evidence of a complicating throat infection and just as often in those with negative as in those with positive tuberculin reactions. Therefore there is no reason for assuming either that a tuberculous or that a streptococcal infection is a requisite condition for the occurrence of pathologic erythrocyturia. Tests showed that in children with erythema nodosum there is often capillary fragility during the erythema nodosum fever. This capillary fragility occurred with about the same frequency in children with pathologic erythrocyturia as in those in whom this sign was not present. Capillary fragility is thought to be due to a toxic

action on the vascular endothelium. The renal lesions are probably to be regarded as an expression of the same remote toxic or allergic action of the infectious agent as that which produced the eruption of erythema nodosum and the capillary fragility of the skin.

British Journal of Dermatology and Syphilis, London

51: 405-450 (Oct.) 1939

Growth of Epithelium in Tegumentary Tissues. H. Leslie-Roberts.—p. 405.

Keratoderma Blennorrhagicum: Review of Condition, Its Clinical Features and Its Treatment, with Report of Three Cases and New Method of Treating Skin Lesions. N. S. Taylor.—p. 418.

Pathogenesis of Keratosis Blennorrhagica. E. Epstein.—p. 428.

British Medical Journal, London

2: 713-752 (Oct. 7) 1939

Intracranial Causes of Headache. H. Cohen.—p. 713.

Headache as Early Symptom of Nervous and Mental Disorder. D. Curran.—p. 717.

*Results with Epanutin in Mental Hospital Patients. Susannah Davidson and J. D. Sutherland.—p. 720.

Treatment of Irreducible Intussusception Due to Meckel's Diverticulum. R. Stuppel.—p. 722.

*Diagnosis and Treatment of Infantile Mastoiditis. P. W. Leathart.—p. 723.

Diphenyl Hydantoinate for Mental Disorders.—Davidson and Sutherland have recently use sodium diphenyl hydantoinate (epanutin) in the treatment of twelve epileptic patients with mental symptoms. The drug was administered by gradual replacement of the drug already in use. Most of the patients were more than 40 years of age and had a long history of hospitalization and correspondingly long treatment with drugs. They were almost all admitted for psychotic behavior as well as fits. The most prominent result of the treatment was the appearance of toxic effects; in eight of the twelve patients they occurred within a few weeks. The toxic effects included headache, giddiness, nausea, loss of appetite and ataxia. Rashes developed in three patients. These effects have already been referred to in connection with this preparation, but their frequent and early appearance obviously restrict the use of the drug, for though some are possibly not serious in themselves they antagonized these patients. The three youngest patients showed no toxic effects. Only one patient showed mental improvement, but this lasted for only a few weeks, after which he lapsed into the former state. This patient also showed a temporary improvement on a change from soluble phenobarbital to methyl-ethyl-phenobarbital or vice versa. The effect of the change to sodium diphenyl hydantoinate was rather more marked. His relapse followed the recurrence of fits. It would appear that in his case, as in some of the others, this drug makes a useful addition to those on which patients can be maintained for a few weeks. The absence of sedative effect proved an undesirable feature with several patients, as it released the excessive irritability and, in some cases, impulsive behavior which was relieved by other drugs. Sodium diphenyl hydantoinate had little effect on the character and number of fits in most cases. However, there was a balance in favor of this drug. The authors' experience suggests that the drug is of use for the younger and better preserved patients, but owing to its toxic effects it is advisable not to use it for more than a few weeks at a time.

Infantile Mastoiditis.—In 146 recent consecutive necropsies Leathart found that mastoiditis undiagnosed in life had been present on one or both sides in twenty-nine cases. The frequency with which mastoiditis complicates other diseases has not been sufficiently realized. The eustachian tube is more horizontal in children than in adults, and normally it opens with each act of deglutition. Because of this horizontal position any material in the postnasal space finds its way through the eustachian tube into the tympanum and then to the mastoid antrum more easily than in adults, especially if the child is lying on his back while feeding. This anatomic difference shows how easily infected mucus can enter the tympanum from the postnasal space in air-borne diseases and how vomited material may do so in food-borne diseases. As a rule there is no discharge from the ear, and swelling behind it is never present at a stage when treatment is imperative. Moreover, often the child is too young to complain. Nevertheless mastoiditis can be recognized in children at an early stage by the presence of local physical signs other than those usually associated with mastoiditis. If

a child suffering from an air-borne or food-borne infection or a wasted bottle-fed infant does not improve, mastoiditis is likely to be the cause and should always be suspected. The child with an increase in temperature, crying out as if in pain, putting his hand to his head, pulling at his ear or rolling his head on his pillow should suggest mastoiditis. There is one physical sign which is constant. It consists in the presence of a palpable gland or glands in the posterior triangle of the neck behind the sternomastoid muscle. They are small at first but increase in size with the chronicity of the mastoid infection. Other conditions produce enlargement of these glands, but mastoiditis in its catarrhal or purulent stage is by far the most common. An immediate operation is not necessary in every case, for in some instances mastoiditis in its early stage subsides spontaneously. Immediate operation is necessary only for a child whose general condition is not improving and who is losing weight and becoming dehydrated. Children suffering from air-borne infection, diarrhea and vomiting or wasted bottle-fed infants should never be fed while lying down, nor should they be allowed to lie on their backs for any length of time. Frequent turning of these infants has led to a definite decrease in the frequency of mastoiditis as a complication in these diseases and has proved a potent factor in promoting spontaneous recovery in infants as yet not ill enough to require operation. Mastoidectomy will save the lives of about 70 per cent of the children in whom mastoiditis is complicating an air-borne or food-borne infection.

Journal of Laryngology and Otology, London

54: 531-610 (Sept.) 1939

Effects of Airplane Noise on Auditory Acuity of Aviators. E. D. D. Dickson, A. W. G. Ewing and T. S. Littler.—p. 531.

Symptoms, Signs and Treatment of Nasal Sinusitis in Children. S. E. Birdsall.—p. 549.

Lancet, London

2: 773-816 (Oct. 7) 1939

Primary Histologic Lesion of Regional Ileitis. G. Hadfield.—p. 773.

Sulfapyridine in Treatment of Pneumococcus (Type II) Pneumonia. T.

Anderson, E. D. Cooper, J. G. Cairns and D. R. Brown.—p. 776.

Pneumonia Treated with Sulfapyridine: Review of 342 Cases. O.

Römcke and E. Vogt.—p. 778.

*Defective Hearing and Nutrition in Children. Phyllis M. Tookey Ker-

ridge, Gwendoline Briggs, D. P. Choyce and Janet Hill.—p. 781.

Hernia Through Foramen of Winslow. M. Silverstone.—p. 786.

Defective Hearing and Nutrition in Children.—Kerridge and her associates tested the hearing acuity of sample groups of children in Great Britain who lived under different social conditions. In one series the children were chosen from good environments in private schools, day schools and boarding schools; in another series they were in public elementary schools or in ecclesiastical orphanages. The latter were chosen because they represented institutions which were hard pressed for funds. The children were between 7 and 14. They were tested with a gramophone audiometer. Every child was given a second chance of doing the test before being classed as a failure. Children who failed the second time were tested individually, and in most cases a teacher's report on their mental capabilities was obtained. A medical history was obtained whenever possible. The ears were examined with an auroscope to detect wax; but, since time did not permit of retesting after removing the wax, some of the failures attributed to wax in the ears may have been partly due to middle ear disease. Finally the child was tested with a pure tone audiometer by air and bone conduction for hearing acuity over the auditory spectrum. In this way the amount and the location of the defect to the middle or inner ear could be determined. The authors report their observations on about 1,000 children with good social conditions and on about 6,000 children with poor social conditions. It was impossible to test all the children in both summer and winter. The authors found that housing was of no significance, since even the children in the poor groups were well housed (orphanages). The two series of children did, however, differ greatly in the food they obtained. Middle-ear disease is about four times as common, on the average, under poor social conditions as it is under good social conditions; in the poorest places, whether urban or institutional, it may be nearly ten times as common as in a good environment, nearly a quarter of the child population being affected. Climate, housing and the mixing of children seem to have little effect on the incidence of the disease. The children with the highest incidence of defec-

tive hearing had diets deficient in many factors, but an increase in the food taken by two groups of these children for a year did not reduce the incidence of defective hearing. The figures here given show that probably the most important work on the prevention of deafness will be done by those who are striving to improve the social conditions and, in particular, the nutrition.

Medical Journal of Australia, Sydney

2: 421-456 (Sept. 16) 1939

Diencephalon: Structural, Functional and Clinical Considerations. A. A. Abbie.—p. 421.

Use of Cardiazol in Psychiatry. B. Barry.—p. 430.

Mental Diseases in Relation to General Practice. J. K. Adey.—p. 438.

2: 457-490 (Sept. 23) 1939

Heart Sounds. E. Murphy.—p. 457.

Some Observations on Pelvicophalometry in Late Pregnancy. D. G. Maitland.—p. 465.

Some Statistical Facts Concerning Whooping Cough in New South Wales. E. S. A. Meyers.—p. 468.

Japanese Journal of Experimental Medicine, Tokyo

17: 333-374 (Aug.) 1939

*Virus of Venereal Lymphogranuloma Obtained by Tissue Culture: Culture on Various Mouse Organs and Virulence Tests in Mice. K. Manabe.—p. 333.

*Id.: Development in Cells and Morphology of Virus. K. Manabe.—p. 355.

Studies on Elementary Body of Polyhedral Disease of Silkworm. T. Taniguchi, M. Asano, M. Hosokawa and K. Ishikawa.—p. 363.

Large Scale Cultivation in Vitro of Vaccinia Virus by Aeration of Medium. H. Yaoi and S. Arakawa.—p. 369.

Virus of Venereal Lymphogranuloma.—According to Manabe the so-called Miyagawa bodies after many investigations were identified as the virus of venereal lymphogranuloma. All other investigators who studied these bodies were able to identify them only after staining, but Manabe has been able to observe them also in the fresh living state. He presents two reports, the first dealing with the culture of the virus on various mouse organs and with tests on the virulence and the second dealing with the development of the virus in the cell and with its morphology. He used a modified cover glass method. The plasma was obtained from guinea pigs; the organ extract was prepared from brain, spleen and testes of adult mice, and the organs used for the virus culture were obtained from mice fetuses or from newborn mice. The virus strains to be examined were from the glands of patients whose disorder had been definitely identified as venereal lymphogranuloma. These strains are inoculated into mice. The diseased mouse brain is removed and immediately emulsified with Tyrode's solution (stock emulsion). Several pieces of organs are dipped into this stock emulsion and then are cultured (virus-tissue culture). Regarding his technic of culture, the author says that plasma and organ extract are mixed on the cover glass; the infected pieces of organ tissue are placed in this, and after organ extract is dropped on the tissues the preparation is sealed with paraffin and placed in the incubator at 37 C. Pieces of organs which are dipped for thirty minutes into an emulsion of healthy mouse brains serve as controls. Since it is not sufficient to identify the virus in the tissue culture, animal tests were made to determine the virulence. The studies revealed that the virus of venereal lymphogranuloma can be cultured in various organs from mouse fetuses or newborn mice. The virus develops with equal advantage in epithelial cells and in fibroblasts. Usually a vacuole is formed, which is filled with virus bodies. These bodies increase for four or five days, and then they decrease with the degeneration of the culture tissue. Their virulence increases as their numbers increase and decreases as the culture tissue degenerates. In his second report the author demonstrates that by means of dark field and oil immersion devices it is possible to observe the living virus and its morphologic development in the cell. Comparing stained specimens with living specimens, in which the virus bodies show motility, one can see that the virus of venereal lymphogranuloma develops and gradually increases in the living cell. Finally it breaks through the cell and repeats this process of development in another living cell. The individual virus bodies are readily differentiable. Occasionally two go together in the manner of diplocoeci, and again several are grouped together. Like Miyagawa and others, Manabe was able to observe differences in the size of the virus bodies.

Presse Médicale, Paris

47: 1381-1396 (Oct. 4) 1934

War Wound Excisions. G. Roux.—p. 1381.

Army Typhus and Its Prevention. P. F. Armand-Delille.—p. 1383.

*Investigations of Adrenal Insufficiency: Effect of Diet, Vitamins and Certain Other Factors on Survival of Adrenalectomized Rats. W. Weslaw and A. Wroblewski.—p. 1384.

Adrenal Insufficiency in Rats.—Weslaw and Wroblewski report the results of dietetic, vitamin and chemical experiments made on 172 white rats on which adrenalectomy had been performed. Male and female rats weighing from 100 to 330 Gm. were used. Recovery after the operation was rapid and left no lesions. The basic diet consisted of equal parts of cheese and barley and of milk. Brewers' yeast and cod liver oil were administered in specified quantities twice a week and occasionally carrots. The experiments were made in twelve series. The control group of forty rats, representing the entire range of the weight scale, was given the basic diet and showed a mortality of 95 per cent from three to twelve days after operation. Since the investigations were undertaken in part to verify the results of tests made by others with regard to survival medication in renal insufficiency, the negative and positive results of their own tests are carefully presented. No satisfactory results were obtained from the use of lactoflavin-5'-phosphoric acid on eighteen rats or on five other rats in which vitamin C was superadded. Cystine and glutathione employed on ten rats and sodium chloride as well as sodium chloride with sodium bicarbonate employed on other groups were equally unable to prevent loss of weight and vitality and death. Positive results were obtained on seven female rats to whose basic diet rye bread was added immediately after the surgical operation; furthermore, in an experiment with five male rats the basic diet was replaced by wheat bread, vitamin C and cod liver oil. The most remarkable results, according to the authors, were achieved with a regimen consisting of fresh wheat bread, thinly greased with lard, and cheese (Tilsitt). Repeated experiments showed that the loss of weight and the signs of renal insufficiency evolving from the basic diet were invariably and immediately arrested by the addition of wheat bread, lard and cheese and invariably reappeared when this addition was withdrawn. It insured survival for more than 100 days. Sodium chloride added to the milk was of no avail in the absence of the triple combination of wheat bread, lard and cheese, nor was potassium chloride in conjunction with wheat bread, lard and cheese. On the contrary, gain of weight was at once stimulated by the omission of sodium chloride. In another group the mere addition of the cheese, without bread, invariably induced vital restoration and caused the symptoms of adrenal insufficiency to disappear. The authors point out that though rye and wheat bread prolonged the life of the adrenalectomized rats from thirty to forty days, respectively, if given at once after the operation, the former in conjunction with the basic diet, the latter without, these regimens could not prevent death. They also assert that cheese by itself gave practically the same results as the rye bread-lard-cheese combination and may be the enigmatic energizing agent.

Schweizerische medizinische Wochenschrift, Basel

69: 869-888 (Sept. 30) 1939. Partial Index

Experiences with Protamine Zinc Insulin in Young Diabetic Patients. W. Trachsler.—p. 869.

*Significance of Vitamin C in Treatment of Addison's Disease. J. Pojer.—p. 872.

Gas Gangrene After Medicamentous Injections: Deceptive Bactericidal Power of Alcohol. R. Regamey.—p. 874.

Alimentary Hygiene: Investigations on Alimentary Deficiencies Among Children of Lausanne. F. M. Messerli.—p. 876.

Vitamin C in Addison's Disease.—Pojer discusses the relationship between vitamin C and the hormone of the adrenal cortex and also the disturbances in the mineral metabolism during Addison's disease. Assuming a synergism of the cortical hormone and of vitamin C in the human organism and an impairment of this synergism in patients with Addison's disease, the author carefully observed the course of two cases of Addison's disease in which he administered large doses of vitamin C. He was induced to try this vitamin C therapy by a report of Laederich and his associates, who found vitamin C highly effective in a case of Addison's disease which had failed to respond to endocrine therapy and to the administration of sodium chloride. The two cases of Addison's disease in which

Pojer tried vitamin C therapy concerned a man aged 26 and a girl aged 14. In both cases it was possible to detect a vitamin C deficit in the urine. However, after four days of treatment with vitamin C the urinary deficit had disappeared. Patients were given daily twenty tablets (each containing 0.05 Gm.) of a vitamin C preparation; that is, the daily dose was 1 Gm. This medication caused changes in the mineral metabolism, as was indicated by the potassium, sodium and chlorine ions. For a time previous to the onset of the vitamin C therapy the patients had been given 15 Gm. of sodium chloride daily. In both patients the potassium content was increased, the sodium content was reduced, but the chloride content was normal. As a result of the vitamin C therapy, the general condition improved and the cutaneous pigmentation was reduced. In the patient who had been given daily 4 cc. of adrenal cortex extract by intravenous injection, the adynamia was reduced. The author concludes that the great improvement in the patients and the reduction in the pigmentation justify the use of vitamin C in Addison's disease.

Atti d. Soc. Ital. Ostetricia e Ginecologia, Rome

35: 333-444 (July-Aug.) 1939. Partial Index

- *Testosterone Propionate in Treatment of Acute Puerperal Mastitis. F. Guercio.—p. 353.
Quinine-Calcium Treatment in Inertia of Uterus with Early Rupture of Membranes. P. Cattaneo.—p. 415.

Testosterone Propionate in Puerperal Mastitis.—Guercio employed testosterone propionate in four cases of acute puerperal mastitis and in one case of chronic mastitis with postoperative lacteal fistula. The patients with acute mastitis stopped lactation as soon as the breast became painful, red and tumefacted. Although the condition was acute in all cases, none of the patients had an abscess when the treatment began. In the only case in the group in which the condition was observed from its onset, a daily dose of 0.01 Gm. of testosterone propionate was administered. The condition rapidly progressed to abscess formation, which was successfully treated by incision and drainage. Three patients were seen within one week from the beginning of the condition. They received a daily dose of from 0.05 to 0.07 Gm. of the substance, up to a total dose of 0.25 Gm. (in four days) or else 0.3 Gm. (in one week). In all cases pain, inflammation and tension of the breast were immediately relieved. In two cases the engorgement rapidly disappeared with consequent disappearance of fever and of the local infiltration. The improvement was moderate in one case of this group, in which mastitis was of the interstitial type. The condition evolved to abscess formation, which was successfully treated by incision and drainage. The patient who was suffering from chronic mastitis and lacteal fistula had a daily dose of 0.05 Gm. of testosterone propionate for four days. The secretion rapidly diminished. The fistula healed in about ten days. In all cases reported lactation could not be resumed. According to the author the treatment gives satisfactory results if it is given early in the development of acute mastitis and with high doses (from 0.05 to 0.07 Gm. a day up to a total dose of 0.25 Gm. in four days or 0.3 Gm. in one week). Duration of the treatment depends on its effects, as shown by the favorable evolution of the condition. However, because of the fact that high doses inhibit milk secretion, the author advises further work on the subject in order to find the proper dosage by which mastitis can be controlled without causing this inhibition.

Ginecologia, Turin

5: 521-586 (Sept.) 1939. Partial Index

- *Surgical Treatment of Stubborn Neuralgia of Bladder. E. Crispolti.—p. 521.
Microscopic Changes of Islands of Langerhans in Some Experimental Conditions (Administration of Dextrose and Insulin). T. Meneghini.—p. 539.

Stubborn Neuralgia of Bladder.—Continuous and persistent pain is the predominant symptom of vesical neuralgia, Crispolti says. It is associated with tenesmus and moderate dysuria. The urine is clear. The symptoms are not related to menstruation. They simulate those of appendicitis, acute abdominal conditions and diseases of the kidney or of the gall-bladder. There is no anatomic lesion in or around the urinary tract which can be considered responsible for the condition,

which is due to neuritis of the pelvico-abdominal sympathetic plexus. The author points out the utility of Cotte's operation, as modified by Pieri, in the treatment of the condition. The modified operation consists in removing the upper hypogastric plexus and making an exeresis of the lateral sympathetic chains of the first sacral segment. The author reports satisfactory results from the modified operation in two cases. The condition dated back several years in each case. The patients were in a general nervous state. They had had various operations because of erroneous diagnoses (appendectomy and nephropexy). Removal of the upper hypogastric plexus and exeresis of the lateral sympathetic chains of the first sacral segment were followed in both cases by immediate and complete disappearance of pain and of all symptoms, control of the dysfunction of the bladder and disappearance of the nervous condition. The satisfactory results have lasted in the two cases up to the present (almost one year after the operation).

Giornale Medico dell'Alto Adige, Bolzano

11: 309-363 (June) 1939. Partial Index

Change of Blood in Fractures. G. di Castro.—p. 309.

- *Pulmonary Tuberculosis and Menstrual Disorders in Puberal Girls. I. Pedrini.—p. 332.

Menstrual Disorders in Pulmonary Tuberculosis.—Pedrini discusses the frequency and clinical significance of menstrual disorders in puberal girls suffering from pulmonary tuberculosis. He observed sixty puberal patients. In a group of fifty-five patients who were suffering from the disease in evolution, forty-four patients complained of menstrual disorders. Amenorrhea existed in thirty-two. The author found that amenorrhea takes place coincidentally with either the development or the aggravation of pulmonary tuberculosis. He believes that its presence is of value first for the diagnosis of pulmonary tuberculosis (when such a diagnosis has not previously been made) and second for ascertaining the evolution of the disease (after a diagnosis has been made). Amenorrhea in pulmonary tuberculosis is secondary to the condition of the lung. It is not related to local conditions of the internal genitalia, which are normal, and it is the manifestation of an organic reaction of defense. Moreover, any treatment which is directed to induce the return of menstruation in the course of the disease is unjustified, erroneous and harmful.

Omnia Medica, Pisa

17: 145-339 (March-June) 1939. Partial Index

- Primary Chronic Polyarthritides: Etiopathogenesis. A. Robecchi.—p. 145.
*Transient Fever of the Newborn. A. Taddei.—p. 223.

Transient Fever of the Newborn.—Taddei noted the behavior of the rectal temperature during the first week of life of 152 infants of both sexes born in the Clinica Ostetrica e Ginecologica di Pisa. The infants were placed in three different groups, being allowed to nurse fifteen or forty-eight hours after birth and fasting or twenty-four hours after birth but fed during the day with a total quantity of 80 cc. of a 4 per cent solution of dextrose administered in small portions. The temperature was taken every three hours, day and night. The author found that the rectal temperature of the infant is different from that of the mother (and also of a twin in case there is one). Three hours after birth it diminishes, but in the course of the first day of life it rises again. Noticeable changes occur as a rule by the third day and disappear by the seventh or eighth day of life. The changes may be of any of the following types: (1) transient fever, (2) moderate fever and (3) hypothermia. The alterations of temperature in newly born infants are not associated with the interval between birth and nursing, fasting, the administration of dextrose solution, the more or less intense turgor of the mother's breast, the appearance of fever with milk secretion or of nonpuerperal fever in the first week of puerperium. The results of observations do not support certain etiologic theories of transient fever, especially those which show dehydration of the infant or the passage of toxic substances from the mother to the infant through the milk as causal factors. According to the author there is a physiologic congenital lability of the system of regulation of the body temperature in infants. Changes of the body temperature occur when the lability is associated either with

stimulation of the cerebral thermoregulating centers by disintegrated proteins which are absorbed by the infant's body (the so-called tumor from birth) or with a disequilibrium of hormones from structures which take part in the regulation of body temperature, such as the thyroids, the adrenals and the hypophysis.

Klinische Wochenschrift, Berlin

18: 1109-1140 (Aug. 19) 1939. Partial Index

- Nicotinic Amino Acids and Cozymase in Blood. H. von Euler and F. Schlenk.—p. 1109.
Blood Structure and Coagulation. C. Wolpers and H. Ruska.—p. 1111.
Nicotinic Amino Acid Therapy in Lupus Erythematosus. W. W. Kühnau.—p. 1117.
*Vitamin C Blood Level in Relation to Metabolism in Fever. F. X. Hausberger and N. Neuenschwander-Lemmer.—p. 1119.
Limits of Diaphragmatic Movements. A. J. Anthony and M. Broglie.—p. 1126.

Vitamin C Loss in Fever.—Hausberger and Neuenschwander-Lemmer record their clinical observations of the behavior of vitamin C in the blood plasma of febrile patients (pneumonia, sepsis, pyelitis), an outgrowth of research studies on the connection between vitamin C and the redox potentiality of the blood and organs in animals and in both healthy and febrile persons. They describe the method employed to determine the vitamin C content and the results of preliminary tests on normal controls. They found that intravenous injections of 10 mg. per kilogram of body weight of ascorbic acid measured at regular intervals were succeeded by a steady diminution of vitamin C in the blood, irrespective of whether the original vitamin C level was high or low. Five minutes after injection, on the average, only 5.4 mg. per hundred cubic centimeters was detected in the blood and after twenty-four hours only 0.48 mg. This diminution may be due to the action of the kidneys (after a lapse of two and one-half hours, 324 mg. of injected ascorbic acid was found in the urine out of 700 mg. administered, the blood level reaching a low value of 1.33 mg. per hundred cubic centimeters), or to the oxidation of the acid or to the rapid absorption by the tissues (the presence of ascorbic acid was observed electrometrically in the nonvascular epidermis two minutes after injection). The analysis of similar doses administered to febrile persons indicated a vitamin C loss in the blood level 24 per cent below that of healthy persons, a 4.1 mg. per hundred cubic centimeter loss on the average. After two and one-half hours the vitamin C blood level was often similar to that preceding injection. The confirmatory evidence of the urine showed that whereas healthy persons excreted as much as 50 per cent within the first hour, febrile patients voided only 15 per cent (78 to 100 mg. out of 600 to 650 mg. injected). The authors attribute this loss of vitamin C to its rapid disintegration in the blood or to tissular absorption. An accelerated vitamin C decomposition in the blood of febrile persons is attested by the fact that while ascorbic acid administered to healthy persons undergoes oxidation slowly, a larger proportion of the amount administered to febrile persons disappears within the same time limits. The same vitamin C impairment was observed by the authors in two cases of artificial fever and one of degeneration of the cardiac muscle. On the other hand, febrile persons subjected for a longer time to vitamin C dosage before the blood level test was made reacted to the test in the same way as healthy persons. The authors are in accord with the view that infectious diseases continuing for some time involve a heightened vitamin C loss and, in consequence, necessitate a heightened vitamin C regimen.

Medizinische Welt, Berlin

13: 1183-1216 (Aug. 26) 1939. Partial Index

- Adnexitis and Appendicitis. G. Haselhorst.—p. 1183.
Problem of Endometriosis. H. Petri.—p. 1185.
*Modern Prophylaxis of Measles. H. Grod.—p. 1192.
Roentgenologic Studies in Gastro-Enterostomy Without Simultaneous Subtotal Resection of Stomach. F. Kern and H. E. Büttner.—p. 1194.
Acceleration of Erythrocyte Sedimentation Speed in Aged and in General Arteriosclerosis. O. Scheurer and H. O. Hagenmeyer.—p. 1195.
Early Treatment of Mastitis. A. Poerschke.—p. 1197.

Prophylaxis of Measles.—Grod first reviews experiences with convalescent serum and with serum from adults and then discusses the use of a mixed serum obtained from retroplacental blood. He employed the latter serum in the course of an epidemic of measles. It was administered to 170 children

in doses of from 15 to 20 cc. In the majority of children the serum was injected on the fourth or fifth day of incubation; that is, at the time when the exanthem appeared. To eight children it was given earlier and to three not until the sixth day of incubation. After excluding the cases in which exposure to measles was not absolutely certain and also those which had not been observed for a sufficient length of time, there remained forty-four cases which were suitable for the evaluation of the efficacy of the serum made from retroplacental blood. In 47.7 per cent of these cases complete protection could be obtained, in 36.3 per cent the severity of the disease was noticeably weakened and in 16 per cent it was not influenced. The author points out that these figures correspond to those obtained with serum from adults. The serum from retroplacental blood was well tolerated by the children. Placental extract, when given under the same conditions and in identical doses, was found to have the same therapeutic effect but was not so well tolerated as the serum from retroplacental blood.

Monatsschrift für Kinderheilkunde, Berlin

79: 147-306 (Aug. 14) 1939. Partial Index

- Gastrointestinal Ulcer During Childhood. E. Wegener.—p. 147.
Contribution to Problem of Tolerance for Morphine in Nurslings. U. Grüniger, J. Graby and A. C. Ohling.—p. 169.
Pathogenesis of Acetone Vomiting. W. Goeters.—p. 176.
Complete Closure of Abdominal Aorta by Thrombosis During Childhood. W. Becker and H. Girgensohn.—p. 180.
Aspects of Lupus Pernio. H. Kohl.—p. 191.
Value of Ide's Chromatic Reaction in Diagnosis of Congenital Syphilis. G. Ernandez and D. Jonas.—p. 196.
Electrocardiographic Reactions in Pylorospasm. E. Limper.—p. 202.
*Evaluation and Treatment of Incontinentia Alvi During Childhood. H. Oegg.—p. 230.

Incontinence of Feces in Children.—Oegg gives detailed clinical histories of three children with incontinentia alvi. The first patient was a boy of almost 9 years and the two others were boys of about 6 years. The author is convinced that functional nervous factors on a psychogenic basis played an important part in the development of the incontinentia alvi, as all of these children lived in an environment that was unfavorable for their psychic as well as physical welfare. After thorough evacuation of the bowel, psychotherapy together with dietetic measures produced cure within a comparatively short time in all three cases. X-ray examination following a barium sulfate enema revealed in all changes in the large intestine. Dilatation was noticeable not only in the region of the ampulla and of the sigma but also in the colon. X-ray examinations of the hand were made for two of the children, and in both of these the bones showed pathologic changes. The diet had been unsuitable in all three of the children. The author assumes that the unsuitable diet produced intestinal changes, which played a part in the pathogenesis of the incontinentia alvi. This assumption becomes even more probable when it is considered that the bones likewise exhibit changes indicative of former malnutrition. The author thinks that the changes in the colon are probably the result of changes in the tonus and motility of the colonic musculature, which in turn are caused by disturbances in the sympathetic nervous system. Although hereditary and mental factors may be the basis, the author is convinced that unsuitable nutrition is the factor that leads to the manifestation of the incontinence of feces.

Röntgenpraxis, Leipzig

11: 461-532 (Aug.) 1939. Partial Index

- *Spondylitis Infectiosa and Its Differentiation from Osteomyelitis, Tuberculosis of Spinal Column and Degenerative Diseases of Intervertebral Disks. H. Bade.—p. 461.
Differential Diagnosis of Juxta-Articular Bone Foci. T. Börsch.—p. 475.
Differential Diagnosis of Benign and Malignant Gastric Tumors. W. Dieker and E. Fahrner.—p. 486.
Rare Form of Diaphragmatic Hernias (Parasternal Hernia). Erika Ellinger.—p. 490.
Spontaneous Gastroduodenal Fistula. F. Eggs.—p. 502.
Calcareous Occlusion of Cholecystochus After Operation on Gallbladder. K. H. Volbeding.—p. 505.
Looser's Zones of Transformation in Femur. H. Schmitt.—p. 509.

Differential Diagnosis of Spondylitis Infectiosa.—Bade shows that spondylitis infectiosa occurs after many different infectious diseases such as scarlet fever, measles, smallpox, influenza, malaria and typhus, after infections with pneumococci, staphylococci and streptococci, and after brucellosis. He reports

ten cases of spondylitis infectiosa. He regards as characteristic a narrowing of the involved intervertebral disk. This narrowing generally does not involve the entire intervertebral disk but frequently only a sector or a half. The adjoining portions of the diseased vertebrae show small irregularities and defects and a more dense structure. In the reported cases the fine osseous foci developed as a rule only after the narrowing of the intervertebral disk. Especially typical for infectious spondylitis is the rapid appearance of reactive proliferations of bone which develop into marginal pads and bridging bands. The differentiation of spondylitis infectiosa from osteomyelitis of the spinal column is easy in the severe acute cases, which often terminate in death before the changes become roentgenologically demonstrable. Subacute and chronic cases of osteomyelitis with sclerosis of the involved vertebra are differentiable from spondylitis infectiosa by roentgenoscopy, as are also those cases in which the roentgenogram discloses areas of fused bone tissue. However, there are chronic cases of osteomyelitis in which the roentgenogram discloses the same narrowing of the intravertebral cleft and the small defects on the terminal plates of the vertebrae as is the case in spondylitis infectiosa and thus a differentiation merely on the basis of the roentgenogram is impossible. The differentiation from tuberculosis of the vertebral column is usually readily accomplished merely on the basis of the x-ray examination. But in the cases in which the roentgenogram is not sufficient for this purpose, the clinical aspects and especially the course will permit a diagnostic decision. In difficult cases, specimens of pus should be inoculated into guinea pigs. It should be remembered that even in spondylitis infectiosa gravitation abscesses may develop, although they are less frequent than in tuberculosis and osteomyelitis of the vertebral column. Another disorder that must be considered in the differential diagnosis is osteochondrosis of the intervertebral disks. This degenerative disease also causes narrowing of the intervertebral disks and sclerosis of the adjacent portions of the bodies of the vertebrae, that is, a picture develops which greatly resembles the terminal stages of spondylitis infectiosa. However, in osteochondrosis the narrowing is uniform throughout the intervertebral disk, defects of the terminal plates are absent and loosening of the structure of the intervertebral disk may cause dislocation of adjoining vertebral bodies.

Zeitschrift für Immunitätsforschung, Jena

96: 193-360 (Aug. 31) 1939. Partial Index

*New Investigations on Immunity in Venereal Lymphogranuloma: Existence of a Special Reactivity Characteristic for Each Group of Receptive Tissues, Determining Evolution of Infection. J. Caminopetros.—p. 217.
Influence of p-Aminobenzenesulfamide and of Similar Compounds on Anthrax. G. Ivánovics.—p. 252.
Experiences with Protective Inoculation in Combat of Diphtheria in Beograd. S. Ramsin.—p. 255.
Experiences with Colloidal Gold Test According to Borowskaja. H. Schubert.—p. 267.
Practical Significance of Serologic Examination, Especially of Complement Fixation Reaction, for Diagnosis of Weil's Disease. W. Gaetgens.—p. 287.

Immunity in Venereal Lymphogranuloma.—Caminopetros tested several series of patients who had adenitis or rectitis by the injection of antigen or of virus into the glandular tissue and into the rectal mucosa or the perianal vegetations. These tests were always complemented by the inoculation of virus and by the search for virus-neutralizing substances in the serum of the patients. Further he investigated whether the specific antigen injected into the vein or under the skin of new subjects, several times a week and for a long period, would provoke the appearance of virus-neutralizing substances in the blood or cutaneous allergy and whether by this procedure the organism could be protected against experimental infection. At the same time he investigated, on the one hand, the preventive action of the serum of convalescents against experimental infection of rabbits and, on the other hand, the curative action of such a serum in cases of rectitis or adenitis. On the basis of his observations, the author concludes that in venereal lymphogranuloma each receptive tissue possesses a reactivity to the infection which is peculiar to it and which determines the characteristics and the evolution of the infection: cure of adenitis in from six to eight months, extremely long persistence of rectitis, and rarity of lesions in the female genitalia in spite of the long

persistence of the virus. The general immunity conferred on the organism by adenitis as well as by rectitis has no influence whatever on the local infection. This immunity, which is manifested by the cutaneous allergic reaction and the refractory state of other receptive tissues (groups of glands) distant from the focus of infection, must be attributed to the direct action on these tissues of the virus circulating in the blood at the onset of the infection. On the other hand, the injection of antigen (several times each week over a long period) can produce neither the appearance of a general refractory state nor cutaneous allergic reaction and cannot protect the organism against experimental infection. In the search for virus-neutralizing substances in the blood, it was found that the threshold was extremely low in rectitis as well as in old cases of adenitis even after inoculation of virus or of antigen. The seroflocculation is not as clearly positive as during the period of inguinal infection. Furthermore, the serum of patients in whom the disorder has existed for a long time has no prophylactic action against experimental infection in rabbits. Such serum seems to have no influence on the evolution of adenitis or rectitis. On the other hand, the injection of antigen into the diseased tissues of adenitis or rectitis exerts a noticeable curative action and can be used in their treatment.

Khirurgiya, Moscow

1-160 (No. 6) 1939. Partial Index

Healing of Wounds and Nourishment. A. Z. Kozdoba.—p. 3.
Nitrous Oxide in Surgery. M. I. Sakharov.—p. 16.
New Gas Anesthetic—Cyclopropane. P. M. Starkov.—p. 26.
*Complications of Spinal Anesthesia. M. A. Egorova.—p. 37.
Experimental Data on Pathogenesis of Shock. N. I. Bobrik.—p. 46.
*Blood Transfusion in Extensive Burns. V. I. Struchkov.—p. 53.

Complications of Spinal Anesthesia.—Egorova reports 128 cases in which operation was performed under spinal anesthesia in the gynecologic and surgical services of the Moscow Clinical Institute. These patients did not present any lesion of the nervous system prior to the operation; 35.7 per cent were free from any complication after the spinal anesthesia, while 64.3 per cent presented a variety of symptoms pointing to the irritation of the meninges. Of these, 10 per cent had a mild transient headache, 13.5 had a headache combined with nausea and vomiting and occasional occipital rigidity and 24.3 per cent had headaches accompanied by a meningeal symptom complex. Syncope took place in 2.4 per cent, involvement of cranial nerves in 3.2 per cent, sphincter disturbances in 13.8 per cent, diminution or loss of tendon reflexes in 15.6 per cent, paresis of the lower extremities in 4.6 per cent and trophic lesions of the skin in six cases. The duration of the symptoms varied from a few days to several weeks, and in a few cases with involvement of the conus caudae from several months to years. The author concludes that the clinical reaction of the human organism to the introduction of anesthetizing substances into the subarachnoid space is of the meningeal type, with occasionally deeper involvement of the brain substance and the roots. These complications were not associated with preexisting nervous lesions. Microscopic studies of a patient dying eighteen hours after gastric resection, from a hemorrhage, revealed the presence of definite leptomeningitis and epiduritis of the spinal cord. The author concludes that spinal anesthesia cannot be regarded as entirely safe and its complications as innocent. The indications and contraindications for its use must therefore be carefully weighed.

Blood Transfusion in Extensive Burns.—Struchkov reports 242 cases of extensive burns treated by the open method. Thirty-seven of the patients presenting shock, grave sepsis or retarded healing were given one or more blood transfusions. The age of the patients varied from 6 months to 63 years. There were nineteen children. The mortality rate in the children's group was 10.5 per cent, whereas among the children treated without blood transfusion it was 19 per cent. Eight patients were given transfusions while in a state of shock. All of these recovered. Of the twenty-four given transfusions during the suppurative septic stage, a striking improvement was noted in twelve, a satisfactory result in eight and no effect in four. In two of the latter conserved blood from nephritic patients was used. Transfusion of fresh citrated blood during the septic

suppurative state had the effect of removing the toxic manifestations. The temperature sharply declined, the appetite improved, and the patients felt stronger and began to gain weight.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 4493-4608 (Sept. 16) 1939

- Humeroscapular Periarthritis. H. E. Rookmaker.—p. 4494.
 *Hematuria, Renal Colic and Formation of Acetylsulfapyridine Calculus After Treatment with Sulfapyridine. I. Snapper, S. H. Liu and H. L. Chung.—p. 4501.
 Treatment of Menopausal Disturbances. M. Scholtens.—p. 4508.
 PicROTOXIN in Poisoning with Barbituric Acid. R. A. Hoekstra and A. J. B. Poortman.—p. 4513.
 Case of Superfetation. D. K. Heeringa.—p. 4515.

Hematuria and Renal Calculi After Sulfapyridine.—Snapper and his associates describe four cases of hematuria after treatment with sulfapyridine. In the first patient, a man aged 35, and in the fourth patient, a child aged 22 months, the hematuria developed without local symptoms. In the second patient, a youth aged 19, the hematuria was accompanied by renal colics, which were apparently caused by dilatation and spasm of the left pelvis and ureter. The probable cause of the hematuria and pain was precipitation of acetylsulfapyridine crystals in the urinary passages, as was confirmed by the post-mortem examination in the fatal (third) case. In this case, the treatment with sulfapyridine caused hematuria but no renal colics. The necropsy revealed a small calculus in the renal pelvis. Examination disclosed that the calculus consisted of a compound of sulfapyridine, probably acetylsulfapyridine.

Acta Medica Scandinavica, Stockholm

102: 1-162 (Sept. 23) 1939. Partial Index

- *Aspiration Biopsy of Liver, with Remarks on Its Diagnostic Significance. P. Iversen and K. Roholm.—p. 1.
 Successful Treatment of Giardiasis in Man with Acranil—a Hydrochloride of a New Acridinic Compound. P. de Muro.—p. 17.
 *Influence of Vomiting and Nausea on Renal Function. J. Clausen.—p. 22.
 Biliary or Duodenal Reflux in Acute Necrosis of Pancreas. J. Bottin.—p. 31.
 Studies on Sulfate Clearance. T. Bjerring and E. Øilgaard.—p. 55.
 Aspect of Coagulation of Blood: Method of Determination of Coagulation Time. E. Hecht.—p. 79.
 Electrocardiogram in Chronic Aneurysm of Heart. O. Nordenfelt.—p. 101.
 *Disturbance of Sugar Metabolism After Acute Carbon Monoxide Poisoning. S. Moeschlin.—p. 140.

Aspiration Biopsy of Liver.—Iversen and Roholm developed a method of aspiration biopsy of the liver by which an amount of tissue sufficient for microscopic examination is obtained. They use a simple trocar consisting of a cannula 18 cm. long and 2 mm. wide and a pointed stylet. The free edge of the cannula is sharp and notched. By turning the cannula on its axis, while it is pushed into the liver, a cutting effect is obtained. The authors introduce the cannula in the posterior axillary line in the ninth intercostal space, just below the lower arch of the last digitation of the serratus anterior, thus passing through the complementary pleural space and the diaphragm before reaching the liver. Before the aspiration, the skin is painted with iodine and anesthesia is produced with a 2 per cent solution of procaine hydrochloride with epinephrine. The anesthesia is effective within two minutes; this interval is used to teach the patient to hold his breath after deep expiration. After the skin is pierced the trocar is pushed in till its tip meets the upper surface of the diaphragm, which moves in breathing. The trocar is then withdrawn a little so that it is clear of the diaphragm. The patient is told to breathe deeply about four times, stopping with deep expiration and fixation of the chest. The last part of the procedure should be carried out quickly, but it should not be commenced before expiration is completed. The trocar is pushed through the diaphragm and into the liver for about 2 cm. The stylet is withdrawn and a record syringe (10 cc.) is attached to the cannula. A vacuum is produced by pulling the piston as far back as possible; the cannula is forced from 1 to 2 cm. into the liver, while the syringe is rotated at the same time. The cannula is quickly withdrawn, and the operation is complete. The authors resorted to this form of biopsy 160 times. It proved successful in 22.5 per cent of the cases. The method involves little inconvenience for the patient, but the risks involved are still somewhat uncertain. For this reason,

the indications for its employment cannot be definitely decided as yet. Tendency to bleeding is a contraindication. The method makes it possible to demonstrate the presence of acute and chronic inflammatory conditions, tumors, degenerative processes, obstruction to the flow of bile and other conditions. The method is helpful not only in the diagnosis but also in the prognosis.

Influence of Vomiting and Nausea on Renal Function.

—In the course of tests on the renal function Clausen occasionally noticed an essential shift in the ratio of urea clearance to creatinine clearance in direct connection with nausea and vomiting, and so he decided to investigate this problem. He cites experiments which demonstrate that medicamentous or mechanical production of nausea and vomiting gives rise to considerable changes in the function of the kidneys. Nausea and vomiting diminish the renal function, and this decrease does not affect the excretion of all substances equally, urea clearance being lowered relatively more than creatinine clearance. This lowering of the renal function is not dependent on changes in the blood pressure, as no decrease of the blood pressure was found during the periods in which the renal function was lowered. The decrease in the renal function coincides with a pronounced decrease in the diuresis. Although this decrease in diuresis may by itself result in falling clearance values, it will influence the urea clearance and the creatinine clearance in the same manner, so that it cannot be the cause of the observed fall in the urea-creatinine clearance ratio. Nevertheless, the author thinks that the abrupt fall in diuresis contributes in some way to produce this fall in the ratio. He thinks that the decrease in creatinine clearance and urea clearance may be due either to changes in the glomerular filtration (due to local circulatory disturbances) or to changes in the activity of the tubular cells, whereas the shift in the ratio between urea clearance and creatinine clearance can be explained only by an increased reabsorption of urea in the tubules of the kidney. The author concludes that these studies are of practical significance as they indicate that caution is necessary in the evaluation of tests of the renal function if nausea and vomiting appear while the tests are being carried out.

Sugar Metabolism After Carbon Monoxide Poisoning.

—The fact that glycosuria is observed after carbon monoxide poisoning induced Moeschlin to examine the sugar content of blood and urine and the diastase content of the urine in all cases of acute carbon monoxide poisoning. In some of these cases he also investigated the sugar content of the cerebrospinal fluid and the course of the blood sugar curve during tolerance tests. He made his investigations in thirty-five cases of acute carbon monoxide poisoning, excluding all cases in which there were no definite signs of intoxication and those in which more than twenty-four hours had elapsed since the intoxication. In 57 per cent of the cases the blood sugar was noticeably increased following the intoxication. The increase in the blood sugar content generally persisted for from twenty-four to forty-eight hours, but in two cases it persisted three days and in one case eight days. The previous existence of a diabetic component was definitely excluded by later tests. There was no parallelism between the severity of the intoxication and the degree of increase in the sugar content of the blood; however, the incidence of hyperglycemia was greater with severe than with mild intoxication. Glycosuria was observed in only 17 per cent of the cases. The sugar content of the cerebrospinal fluid proved noticeably increased in eight of eleven cases. The diastase content of the urine was not increased after carbon monoxide poisoning. The most interesting changes were observed in the blood sugar curves, the majority of which were pathologic. Some had the typical diabetic outline, with steep increase in the blood sugar, absence of a double peak and retarded decrease, whereas others had a steep and high increase with a comparatively rapid decrease. Repeated control tests revealed that the changes decreased rapidly, so that after a few days or a week normal curves were seen. The author was able to corroborate the appearance of leukocytosis following acute carbon monoxide poisoning, and he found that this leukocytosis is more frequent than hyperglycemia. He believes that the disturbances in the sugar regulation are caused by a central impairment, but he is unable to decide whether this impairment is due to the direct toxic action of the carbon monoxide or to hypoxemia.

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LOW BACK PAIN

CORRELATION OF SOME OF THE SIGNS AND SYMPTOMS

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During the past five years especially, great strides have been made toward a clearer understanding of the protean causes of low back pain. With this broader knowledge, contributed to by many orthopedic surgeons and neurosurgeons, the accurate diagnosis of low back pain has become most complicated. It has not been many years since the differential diagnosis rested only between a lumbosacral or a sacro-iliac lesion as the cause of both low back pain and so-called sciatica. Many of those who studied the problem from day to day and year to year were of the impression that they understood the subject completely, only to run up against a blank wall of misunderstanding at too frequent intervals. Many orthopedic surgeons believed that the problem was simple and that it was merely a question of differentiation between lesions in the two regions, lumbosacral area versus sacro-iliac joints. The fact that there were many signs and symptoms common to the two lesions was known but not fully appreciated. The fact that the lumbosacral protagonists cured a large proportion of their patients, as did also the sacro-iliac exponents, was a constant source of forensic debate. Now one is able to appreciate, to a certain extent, why neither school of thought was completely convincing: because there was actually a third lesion, the herniated or protruded intervertebral disk, then unrecognized in its frequent role as a cause of low back pain and sciatica. Today we see this herniated disk lesion invested with tremendous responsibilities—possibly too great responsibilities. Though this pathologic lesion is a definite, proved clinical entity and its recognition and removal have cured many patients, one must not become overzealous and believe that this lesion alone is responsible for the majority of cases of low back pain, with or without sciatic pain.

At the same time that the herniated disk syndrome has become better known, so also have the intricate and less obvious muscular and fascial lesions about the lower part of the back, pelvis and thigh yielded to clinical and scientific study. Physicians are faced now with many more functional and organic causes for the acute and the chronic low back pain and with a much greater differential diagnostic problem. Likewise, as the surgical procedures developed to attack these several newer lesions are accompanied by relatively little danger to the

general health and life of the patient, surgery has assumed an even more common means of treating the many who suffer pain in the back. The proponents of the several newer surgical procedures for the relief of such pain have sounded many warnings and admonitions regarding the too free use of these operations, but what orthopedic surgeon has not seen patients with the back pain or sciatica still present after one, two or three operations. The last operation is usually successful, but could not the previous one or two have been avoided? Again, have conservative means, such as postural training, traction, manipulation, physical therapy and braces, been used intelligently before surgical attack has been carried out? In many cases early surgical treatment is to the great advantage of the patient, but in other series careful study of the individual patient will show that nonsurgical therapy alone is indicated in from 80 to 90 per cent of the cases.

In this discussion the infectious lesions capable of causing low back pain have been excluded because, in general, they are more readily recognized, and when recognized the therapy is well indicated. Suffice it to say that an active infectious lesion is treated conservatively and that a painful or unstable joint due to a pre-existing infectious process must be immobilized either by muscular or mechanical support or by operative fixation.

DIAGNOSIS

The real diagnostic problem in low back pain, with or without sciatica, is to differentiate between the primary and secondary causes for the pain and to evaluate their relative significance with regard to therapy. There are several conditions in which treatment of the secondary lesion alone relieves the pain temporarily, and even permanently, but when this plan of therapy is relied on it must be used knowingly. In the lower part of the back there are numerous true joints: those between the lumbar articular processes and the sacro-iliac joints. Traumatic or infectious processes involving one or more of these joints is accompanied by an involuntary muscle splinting or muscle spasm, response similar to that associated with lesions in other joints in the body. This muscle spasm associated with low back lesions may involve one or more muscle groups of the spine, pelvis or thigh. Dissimilar lesions may be and are associated with similar types of muscle spasm responses. Therefore the clinical picture of the so-called sciatic scoliosis, with limitation of normal mobility of the lumbosacral joints and restriction of the straight leg-raising test, cannot be indicative of any one lesion. Likewise, as the muscle spasm, per se, may be painful or may cause secondary painful areas, it is frequently difficult to differentiate between the primary lesion causing the muscle spasm and the secondary lesion, which is sometimes the true cause of the pain. It is this situation, peculiar to the low back lesions, which has caused the

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confusion of diagnoses and therapeutic procedures. Add to this picture the rather frequent anomalies of structural development of the osseous tissues in the lumbosacral area, and the maze is complete.

The primary lesion associated with low back pain may be a true joint lesion, synovitis, a ligamentous trauma, periostitis at the site of muscle origin or insertion, myositis, fasciitis or a lesion of the intervertebral disk. The etiologic factor initiating the syndrome of back pain, with or without sciatica, may be a trauma disrupting the normal function of a joint, a ligamentous or periosteal tear associated with primary localized hemorrhage and secondary fibrous or scar tissue formation. It may be a gradual fascial or muscular contracture dependent primarily on faulty posture. In this last instance the faulty posture may be due to an osseous anomaly associated either with hypermobility and instability of the lumbosacral or fourth and fifth lumbar articulations or muscle imbalance dependent on some other cause, such as pregnancy with persisting relaxation of the abdominal muscles. The primary lesion in many cases is similar to lesions occurring commonly about other joints of the body but obscured because of the intricate mechanism involved in the lower part of the back. Furthermore, this joint or ligamentous lesion initiates a series of muscle responses which may be common to all of the different primary lesions.

Obviously, before an attempt is made to treat a syndrome involving low back pain the lesion must be identified. The history of the mode of onset is especially important. Was there a trauma and, if so, what was its nature? Have there been previous similar attacks, were they induced in a similar manner, and was leg pain or sciatica invariably present? Have the initial symptoms persisted, or did they disappear as new symptoms developed? In other words, in many cases the history will clearly bring out the fact that there was a single site of pain and tenderness, subsequently masked by the gradual development of secondary symptoms. The story of something slipping or snapping as a primary symptom should not be passed over lightly, as this sign usually indicates a ligamentous or periosteal tear which may well be the lesion to be treated. Postural strains, such as accompany automobile driving and faulty posture at a desk, frequently initiate a muscle imbalance causing an anomalous lumbosacral structure to become symptom producing. Equally important in the history is the fact that certain body positions or attitudes relieve the pain. Finally, the detailed history in the case of both acute and chronic backaches is just as important as in other bodily ailments.

On physical examination, the signs and symptoms associated with low backache may be numerous or few, depending on the individual case. The acute low back pain with or without sciatic pain should be approached in a manner entirely different from that suited to the chronic case. Many of the acute cases of recent onset represent ligamentous, periosteal or muscular tears with associated local bleeding. An extensive physical examination accompanied by forceful testing of the range of mobility of the various joints is definitely contraindicated, as it is in the case of acute ankle or knee lesions. Manipulation under these circumstances will tend to aggravate the lesion and increase the degree of damage, although an existing painful muscle spasm may be temporarily relieved. Observation and palpation will elicit the location of the areas of tenderness and injury. Acute ligamentous, capsular and muscular lesions elsewhere in the body are treated by immobilization and

the control of local bleeding. Therefore, in similar lesions about the lower back region immobilization by adhesive strapping and bed rest, accompanied by cold compresses or ice bags, is similarly indicated for at least forty-eight hours. These soft tissue lesions require from seven to twenty-one days to heal; therefore supportive therapy should be pursued for this period. It is the failure to recognize the nature of these initial lesions which contributes toward many of the recurrences of symptoms and toward many of the secondary persisting ligamentous, fascial and muscular lesions seen in the chronic cases of low back pain. Inadequately treated ruptures of the internal lateral ligament of the knee joint result in an instability of the knee joint associated with recurrent episodes of pain, synovitis and muscular imbalance. Ligamentous tears healed by relatively wide bridges of cicatricial tissue result in elongated or contracted ligaments with a relative loss of elasticity. Untreated periosteal tears are followed by areas of organized subperiosteal hematomas and fibrous tissue infiltration. Similar sequelae develop in muscle lesions. The sites of these soft tissue lesions about the lower part of the back are fairly constant, as determined by areas of pain or, more reliably, by point tenderness on pressure.

The more severe low back injuries may be accompanied by lesser fractures involving articular processes, laminae or pedicles. The prompt recognition of a fracture involving the arcus of a vertebra and its subsequent immobilization will prevent many chronic complaints involving the lower part of the back. These fractures, although often isolated and small, are true fractures not only capable of producing symptoms but requiring from eight to ten weeks to heal. Nonunited, these lesions may offer sufficient local instability to be the basis of recurrent or constant pain.

The exact mechanism and degree of trauma preceding ruptures of the annulus fibrosus and consequent posterior protrusions of the intervertebral disks has not been definitely determined. Likewise, the less frequent lesions of the ligamentum flavum followed by hypertrophy or cicatricial thickening of the ligament are not clearly understood. That these lesions do occur and that they may be associated independently with constant or recurring attacks of low back pain with or without sciatic pain must be accepted. However, that these lesions occur and that in many cases reported by many authors complete recovery has followed laminectomy does not indicate that in all instances recovery or relief from symptoms depends solely on removal of the lesions. The functional mechanism of the lower part of the back is intricate and varies extensively with the functional demands placed on it; hence it is highly probable that more than one factor is responsible for the production of pain or dysfunction in many cases. Likewise, the elimination of one of two or more abnormal conditions in a given case may result in complete relief from symptoms and clinical recovery. From the very nature of the lesions at operation and the history of no recent injury, a protruded disk and a recent low back pain cannot always be correlated. Previous episodes of low back pain in a patient have been relieved by conservative therapy, but in a later, possibly more severe, attack a protruded disk has been discovered and removed. Was this disk the causative factor in the previous similar attack of back pain? An analogous situation may arise in the case of congenital bilateral pedicle defects of the fifth lumbar vertebra, entirely symptomless for twenty-five or more years, which are discovered associated with an attack of

low back pain with or without sciatic pain. The instability of the lumbosacral joint in this instance may be, and often is, a predisposing factor in the clinical picture; nevertheless, a certain number of these patients are cured or relieved by nonoperative therapy or by lesser operative procedures not actually involving the pedicle defects.

Some authors have reported rather large series of cases of sciatic pain, with and without low backache, entirely relieved by epidural injections, neurolysis of the sciatic nerve or injection of fluids into the sheath of the sciatic nerve. Obviously, without regard to the foregoing discussion it may be assumed that many conditions about the lower part of the back are capable of causing painful manifestations and that because of the intricate mechanism of this region no one type of lesion can be accepted as the chief etiologic factor. From one large orthopedic center the report has been made that from 80 to 90 per cent of the cases of low back pain are relieved by conservative measures. Possibly this estimate is somewhat high, but nevertheless there is too great a discrepancy between this percentage of nonsurgical cases and the figures from many smaller orthopedic centers.

SIGNS AND SYMPTOMS

Obviously, not all of the signs and symptoms associated with low back pain can be discussed in this paper. The following features, frequently encountered, are the bases for varied clinical conclusions:

The history of acute aggravation of pain in the lower part of the back, buttock or sciatic nerve area accompanying sneezing or coughing is often attributed to an increased intraspinal fluid pressure and is consequently considered an indication of a protruded disk or of other mechanical pressure on the nerve root. On the other hand, sneezing and coughing are closely linked with spasmodic contracture of the abdominal and back muscles. Lesions of the fasciae, muscles or joints may therefore be equally affected momentarily. Especially is this true of periosteal lesions.

So-called sciatic scoliosis with flattening or convexity of the lumbar spine may accompany any acute or subacute lesions of the lower part of the back and in itself is indicative only of an irritative lesion of the neuromuscular mechanism of this region.

Relief from pain and disappearance of muscle spasm on lying down generally imply that a postural or abnormal mechanical strain has been removed from a lumbosacral or sacro-iliac joint. Intraspinal lesions, protruded disks and hypertrophied ligamenta flava usually, although not constantly, are unaffected by changing of position such as lying down or sitting.

In the presence of muscle spasm or contracture of the gluteus maximus or hamstring muscles or both, limitation of forward bending in the standing position as compared with the sitting position has relatively little significance, as in standing the affected muscles are put on increased tension and in sitting they are relieved of this tension. In the absence of muscle spasm or contracture of these muscles, however, this test aids considerably in differentiating between lumbar and sacro-iliac or fascial lesions.

Limitation of passive lumbar flexion in the supine position signifies a lumbar or lumbosacral articular lesion.

The straight leg-raising or Lasègue test when definitely positive may be interpreted in several ways: Limitation of hip flexion with the knee extended may

be due to spasm of the gluteus maximus and hamstring muscles caused by lesions of these muscles or their periosteal origins, lesions of the sciatic nerve or its nerve roots, or articular lesions of the sacro-iliac or lumbosacral joints accompanied by muscle spasm. On the other hand, pain induced on one side only, regardless of which leg is tested, usually centers attention on the sacro-iliac joint of the painful side.

The Ober test for contracted thigh fascia may be positive as the result of muscle spasm involving the tensor fasciae femoris and gluteal muscles. When this test causes a localized pain, a periosteal lesion should be suspected. When the Ober test is positive during an interim between attacks of back pain it is really indicative of contracture of the fascia lata or of the iliotibial band.

The Ely, or prone knee flexion, test is one of the most valuable maneuvers to demonstrate the existence of thigh fascial contractures but not of a lumbosacral lesion, as originally described. In the first place, because of the position of the patient, spasms of the glutei and hamstrings play practically no role. If on passive flexion of the lower leg on the thigh the buttocks arch away from the table and at the same time the leg abducts at the hip joint, a true contracture of the anterior and lateral thigh fascia is demonstrated.

In the supine position with the knee extended, internal rotation of the leg followed by slight flexion of the hip and adduction of the leg may cause localized pain in the buttock. When associated with pain or pressure over the piriformis muscle, one of two lesions is indicated: either a lesion of the piriformis muscle or a lesion of the sciatic nerve or its sheath in the region of the piriformis muscle.

Again in the supine position, on passive twisting or rotation of the pelvis by forcing the flexed hip and knee of one side across the body while fixing the ipsilateral shoulder, limitation of motion on one side associated with pain suggests an articular or capsular lesion of the lumbosacral or sacro-iliac joint, depending on the site of the pain. Relief from symptoms following this manipulative test is especially dramatic in some instances.

Probably the most valuable of all the tests in determining the exact site of periosteal, ligamentous or joint lesions is the localization of one or more areas of definite tenderness on palpation when the patient is lying comfortably on a firm table. Unless a careful routine is carried out, the area of maximum tenderness may be missed. The most frequent points of tenderness may be found at the following sites:

1. The supraspinous ligament between the spinous processes.
2. The periosteal attachment of the erector spinae muscles to the dorsum of the sacrum.
3. The gluteus maximus and medius origins along the iliac tuberosities and crests.
4. The piriformis muscle, an area midway between the greater trochanter and the posterior-superior iliac spine.
5. The iliotibial tract or fascia lata over the greater trochanter and between the greater trochanter and the iliac crest.
6. The sacro-iliac notch or the posterior-inferior sacro-iliac ligaments.
7. The lumbar zygapophysial joints, about 1 inch lateral to the spinous processes.

If a single site of definite tenderness is found on palpation and the lesion is not of recent origin, the injection of a few cubic centimeters of 1 per cent procaine hydrochloride may relieve the pain temporarily.

or, less frequently, permanently. This relief of pain on injection of procaine hydrochloride usually demonstrates the fact that the lesion involves periosteal or ligamentous tissues previously the seat of a trauma or inflammatory process. If the injection is in the vicinity of a nerve such as the superior or inferior gluteal it may be argued that the pain stimulus is interrupted by temporary nerve block, but this explanation is not entirely satisfactory.

In this discussion of low back pain two important types of observation are not included, namely the complete neurologic and x-ray studies. Obviously, these examinations must be included. Suffice it to say that in both the spinal studies must be correlated with the other clinical data. A diminished or absent achilles tendon reflex does not always signify the existence of a protruded intervertebral disk, but this is often the case. Subjective numbness or sensation of coldness of the leg in the absence of disturbance of sensation does not indicate an essential sciatic nerve involvement. A neurologic examination will exclude central nervous system degenerative lesions or peripheral neuritis. When the general observations suggest an intraspinal lesion, lumbar puncture studies and, if indicated, visualization studies with iodized oil should be made. The x-ray examination must also be interpreted in the light of the purely clinical features, as some anomalous osseous lesions are the cause of low backache while others are proved to be merely coincidental.

The scope of this paper does not include a discussion of therapy. If an exact diagnosis can be made, the choice of treatment is usually obvious, and a plan of preliminary conservative therapy is suggested. The fasciotomy of Ober, the periosteal stripping of Heyman, the myotomy of the piriformis, laminectomy and fusion operations are all excellent procedures on the condition that they are carried out in carefully studied and selected cases. Contractured or permanently shortened fasciae and muscles should be stretched or cut, but fasciae and muscles under increased tension due to muscle spasm should be treated conservatively.

CONCLUSION

Any disturbance of the mechanical function of the lower part of the back may initiate somewhat similar combinations of signs and symptoms. Ligamentous, periosteal, muscular and fascial lesions may be identified by physical examination. Restriction of motion and tenderness to palpation remain as the most significant physical features. Initial conservative, nonoperative therapy serves a twofold purpose, as a valuable diagnostic aid and as a method of curing a large number of the patients.

ABSTRACT OF DISCUSSION

DR. PHILIP LEWIN, Chicago: I should like to emphasize conservatism, which can easily be changed when new facts are presented. We are in a state of evolution analogous to that in which we were concerning fracture of the neck of the femur a few years ago. I should like to place before you the analogy of what I term a double U, that is one U superimposed on an inverted U, which will help to visualize some aspects of the problem. The upper U consists chiefly of the erector spinae, the intervertebral disks and ligamentum flavum lesions, the lower U, chiefly the tensor fasciae latae, and lumbosacral and sacro-iliac joint, the piriformis and the coccygeus muscle. Each human leg is a fork of the theoretical U. The three points indicated are the lumbosacral and the sacro-iliac joints. The lower U is composed of the tensor fasciae latae, the sacro-iliac,

the lumbosacral joint, and the piriformis and the coccygeus muscles. When these are superimposed, one has the double U analogy. Any procedure that breaks the circuit may give, in certain selected cases, complete or partial relief. These procedures are chiefly injections, liberations, fusions and relief from pressures, such as following the operation for protrusion of the intervertebral disk and hypertrophied ligamentum flavum. One of the oldest complaints and observations with regard to backache is pain or stiffness or both on resuming activity after a period of rest. One need only to watch elderly persons arise from bridge or see a group of people get out of a bus after a long ride and observe the stiffness which appears on resuming activity. I have given it the name "postinertial dyskinesia." I should like to ask the facetious question Where do the intervertebral disks hide between attacks? Chamberlain and others have offered some plausible answers to this question. I should like to suggest the general use of the term "spondylogram" or "spinogram," like the cardiogram. I have found at operation in several cases fusion of the ligamentum flavum and the dura, which I call "ligamentothecosis" or adhesive ligamentothecitis. I believe that this lesion is definitely a trauma which may produce hemorrhage, some scarring, some more trauma, adhesions and, when the patient bends, especially forward or backward, there is a pull on the sheath and pressure on the nerve. I believe in some cases that produces pain.

DR. G. C. BATTALORA, New Orleans: There are probably no other diagnostic problems more complex than low back disorders. The difficulty is not lessened by the fact that several different conditions can give rise to a similar picture. I am going to dwell mainly on the so-called low back syndrome in which there are backache, sciatica, list of the spine to one side or the other, and positive leg signs, with absence of ankle jerks. Certain neurosurgeons rely exclusively on these manifestations in making a diagnosis of a disk lesion. The frequency with which one sees disk protrusions has struck me forcibly, in observing certain dissecting room preparations. I know well that the incidence of these protrusions does not parallel the incidence of disabling symptoms that certain patients complain of. If a patient has these symptoms and signs, with the ankle jerk absent, this absence of the ankle jerk may be due to pressure on the fourth or fifth lumbar nerve roots, either in the intraspinal spaces or perhaps outside, because of spasm in certain muscles. If one treats these cases conservatively, relieving the irritative lesions on the nerves, one can get a reestablishment of the reflexes; therefore, before making a diagnosis of a disk lesion one should exclude all other orthopedic problems.

DR. EARL D. MCBRIDE, Oklahoma City: A sign which I term the "cocked knee sign" has been puzzling to me with regard to its mechanics. It seems to be a characteristic sign in certain cases of muscle spasm associated with sciatic nerve involvement. The patient can sit erect when the knee on one side is flexed, but when both knees are flattened straight out on the table the patient has to lean backward and cannot bend forward. One would naturally feel that this is muscle spasm related to the hamstrings and gluteus muscles, but on experimenting by injecting procaine hydrochloride I have become more puzzled as to the exact mechanics.

DR. JOSEPH A. FREIBERG, Cincinnati: In this paper I made practically no mention of the piriformis operative procedure, which was first described by Dr. Albert Freiberg, of Cincinnati. The reason for this is that I have felt on further observation that the majority of the sciaticas which are dependent primarily on spasm of the piriformis muscle respond to conservative therapy. I have probably done fewer piriformis myotomies than many of the larger clinics. Regarding the diminution or absence of ankle jerk in many of these low back cases, it is my opinion that all of them cannot be explained. It is a sign of a lower motor neuron lesion, and certainly all orthopedic surgeons have seen many diminished or absent ankle jerks return to normal following conservative therapy. Whether this means, as the neurosurgeons will usually say, that a herniated or protruded disk fragment has returned to its former place of residence, I do not know, but I believe that some of them may be accounted for on the basis of a severe piriformis spasm which has responded to conservative treatment.

THE INCIDENCE OF HEMORRHAGE
OCCURRING WITH PERFORA-
TION IN PEPTIC ULCER

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AND

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CHICAGO

The impression that bleeding ulcers do not perforate and ulcer perforations do not bleed seems to be generally accepted by physicians and surgeons as true. That occurrence of bleeding and perforation together is uncommonly encountered is inferred from references stating that it is well known that bleeding ulcers rarely perforate and vice versa¹ or that bleeding and perforation rarely occur together.² Finsterer,³ in a vast experience, reported finding hemorrhage and perforation occurring together only three times. Blackford and his associates⁴ concluded "bleeding ulcers don't perforate; and ulcer perforations don't bleed." James and Matheson,⁵ however, reported hemorrhage in the presence of perforation of a peptic ulcer and, again, hemorrhage which followed surgical resection of a peptic ulcer. They questioned the validity of the accepted impression.

Bleeding that occurs with peptic ulcer may be described as massive, moderate or slight. The massive hemorrhage is usually sudden in onset and produces the clinical picture of shock, faintness, weakness, rapid pulse, pallor and signs of collapse. Loss of consciousness may occur. Vomiting often follows if the stomach is sufficiently distended or if obstruction to the outlet is present. The vomitus may be described as "blood," "bloody vomitus," "coffee-ground vomitus" or "vomitus stained with blood." The patient is usually able to describe the quantity and consistency. If, however, there is no vomiting, the blood lost is passed as melena. The observing patient will note the black or tarry consistency of the stool, but the unobserving patient may describe the attack he experienced as a fainting spell and allow it to pass as such. Moderate amounts of bleeding more frequently will pass unnoticed. The symptoms of the patient will then be chiefly those of anemia. Pallor may be noted. Exercising may cause palpitation, rapid pulse or dyspnea, or the patient may feel more easily fatigued than formerly. Weakness may be the chief complaint. The character of the stools will be most important, however, and usually gives the clue. Slight amounts of bleeding are usually not detected and are discovered only by a careful history, physical examination or laboratory tests.

Early peptic ulcers that are produced experimentally are covered with a thin gray homogeneous membrane.⁶

Removal of this membrane at the site of the beginning ulcer by a gentle sponging causes profuse bleeding. After the process has eroded the mucosa, it may proceed until the entire wall of the intestine is perforated. The time necessary for an ulcer to develop may be short. The mucosa may be penetrated in a few hours or more. Perforation may occur in a relatively short time after the mucosa has been penetrated. An ulcer may present the typical appearance of a chronic ulcer after three weeks, and an ulcer that is 5 months old may have the gross appearance of an ulcer 1 month old.

It is conceivable, therefore, that in a patient with a peptic ulcer the lesion may become active and cause further ulceration and perforation. This may occur with the patient who gives a brief history of symptoms but has had no management instituted. It may occur with a patient who has had an ulcer for some time, has had it controlled and has been placed under ambulatory management, or it may occur in a patient who has been resistant to management and treatment but has reached the stage where the healing processes are slowly progressive. The ulcerating process may proceed to bleeding by digestion of a thrombus from a previously thrombosed vessel or by erosion of blood vessels that may lie in the deeper structures of the ulcer crater. The amount of bleeding that follows will depend on the size and character of the blood vessel that is eroded, followed by the rapidity of the patient's reparative processes. Perforation, if it should occur, demands no delay in treatment.

In a partial review of the literature to note the incidence of hemorrhage in perforated peptic ulcer, Eliason and Ebeling⁷ collected 240 cases from the literature and found a history of previous hemorrhage twenty-four times. They added to this frank hematemesis in the past history in nine of fifty-four cases and melena in nine of fifty-one cases. Hematemesis at the time of actual perforation was observed four times. Shawan⁸ reported 227 cases, in seventeen of which there was a history of bloody vomitus, and blood was recorded in the examination of the stool eleven times. Rhodes and Collins⁹ reviewed 155 cases, in two of which there was a history of coffee-ground vomitus, but in no case was hematemesis or melena recorded. McCreery¹⁰ reported 170 cases, in five of which there was hematemesis and in thirteen tarry stools. Mondor and Lauret¹¹ noted hematemesis once in seventy-five cases of perforated gastric ulcer. In seventy-five cases of perforated duodenal ulcer abundant hematemesis was reported in two cases and blood-tinged vomitus in two cases.

Raven¹² reported melena twice and hematemesis once in a series of eighty cases. White and Patterson, quoted by Brenner,¹³ reported bleeding in 3 per cent of sixty-two cases. Jirásek and Persky¹⁴ noted fresh blood or coffee-ground material in the vomitus of seven patients in a series of eighty. James and Matheson⁶ stated that they had seen bleeding and perfora-

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From the Department of Internal Medicine, Northwestern University Medical School, and the Department of Internal Medicine, Cook County Hospital.

1. Graves, Amos M.: Perforated Peptic Ulcer, *Internat. S. Digest* 10: 259 (Nov.) 1933.

2. Berg, Benjamin N.: The Coexistence of Perforated and Bleeding Duodenal Ulcers, *S. Clin. North America* 11: 543 (June) 1931.

3. Finsterer, H.: Die operative Behandlung der akuten profusen Magen- und Duodenalblutungen, *Wien. klin. Wchnschr.* 44: 1125 (Sept. 4), 1160 (Sept. 11), 1185 (Sept. 18) 1931.

4. Blackford, J. M.; Smith, Alfred L., and Asfleck, Dean H.: Peptic Ulcer Emergencies, *Am. J. Digest. Dis. & Nutrition* 4: 646-650 (Dec.) 1937.

5. James, T. G. L., and Matheson, N. M.: Acute Perforation of Peptic Ulcer, *Lancet* 1: 945-946 (May 5) 1934.

6. Ivy, A. C., and Fauley, G. B.: Factors Concerned in Determining the Chronicity of Ulcers in the Stomach and Upper Intestine, *Am. J. Surg.* 11: 531-543 (March) 1931. Mann, Frank C., and Bollman, Jesse L.: Experimentally Produced Peptic Ulcers, *J. A. M. A.* 99: 1576 (Nov. 5) 1932.

7. Eliason, E. L., and Ebeling, Walter W.: Catastrophes of Peptic Ulcer, *Am. J. Surg.* 24: 63 (April) 1934.

8. Shawan, Harold K.: Acute Perforated Gastric and Duodenal Ulcers, *Ann. Surg.* 98: 210-220 (Aug.) 1933.

9. Rhodes, George K., and Collins, Donald C.: Acute Perforated Peptic Ulcers, *California & West. Med.* 39: 173 (Sept.) 1933.

10. McCreery, John A.: Perforated Gastric and Duodenal Ulcer, *Ann. Surg.* 107: 350-358 (March) 1938.

11. Mondor, Henri, and Lauret, Gaston: Les ulcères perforés de l'estomac et du duodenum, *Paris, Masson & Cie*, 1923, p. 73.

12. Raven, R. W.: Perforated Gastric and Duodenal Ulcers, *St. Barth. Hosp. Rep.* 63: 199-249, 1930.

13. Brenner, Edward C.: Perforated Ulcers of the Duodenum, *Ann. Surg.* 102: 185 (Aug.) 1935.

14. Jirásek, A., and Persky, M. A.: A Study of Eighty Cases of Acutely Perforated Gastric and Duodenal Ulcers, *Rhode Island M. J.* 11: 40-43 (March) 1928.

tion twice in seventy-five cases. Deaver and Pfeiffer¹⁵ noted hematemesis and melena twice in fifty-five cases. Hematemesis at the time of actual perforation was observed four times. Mitchell¹⁶ encountered hemorrhage three times in a series of fifty cases. Brenner¹³ reported a history of melena four times with no hematemesis and melena in a series of fifteen cases.

Blackford and Baker¹⁷ noted massive hemorrhage at the time of perforation in one instance in twenty-one cases. They also stated that slight hematemesis is common. Shawan and Vale¹⁸ reported one case with hematemesis and melena in a series of ten cases. Horsley¹⁹ noted no mention of recent bleeding in eight cases, and in only one of these was there any bleeding at all—hematemesis nine months before. Morrison²⁰ reviewed 200 cases and recorded no bleeding.

from incipience of his ulcer syndrome to its termination and the sequence of events that intervene.

With these thoughts in mind, we reviewed the records of patients with a diagnosis of perforated peptic ulcer who were admitted to Cook County Hospital for the period 1935-1938 inclusive to note the incidence of hemorrhage. Some of these patients had been treated in the various charitable clinics of Chicago prior to the time of their perforation. Many had been patients in the Cook County Hospital at some previous time and, at the time the accident happened, were being treated in the outpatient clinic maintained by the hospital. Other patients had not previously been attended by any physician.

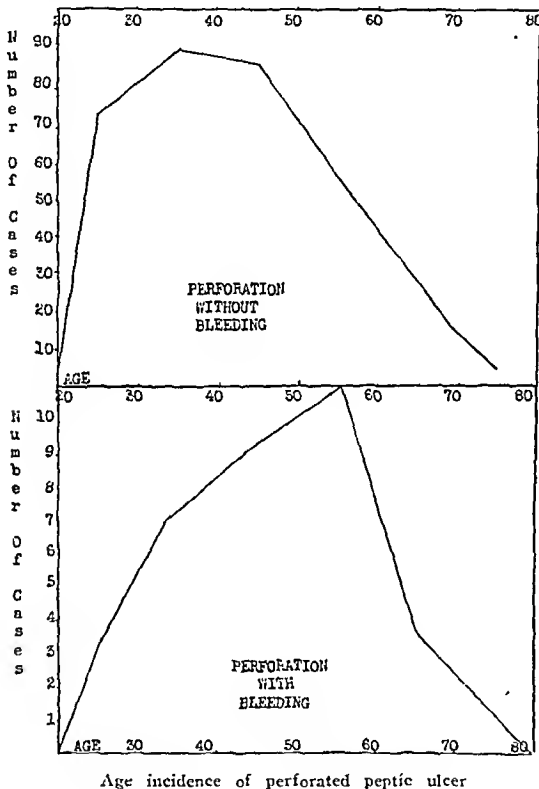
Only patients with histories of peptic ulcer as the essential lesion were selected. Those with a history of some other disease as the essential diagnosis, e. g. arteriosclerosis, cardiac disease, cerebral disease and hepatic disease, with peptic ulcer as the incidental lesion, were not considered.

The diagnosis was made by the usual accepted history and physical evidence of a perforated ulcer. The operative report of repair of a peptic ulcer or report of a perigastric abscess²¹ confirmed the diagnosis in the majority of cases; the fluoroscopic demonstration of air under the diaphragm confirmed the diagnosis in a few cases. An autopsy was made when permission could be obtained.

In reviewing the histories an attempt was made to get a history of ulcer activity, bleeding and perforation that would be clinically significant. Bleeding was not necessarily the most important aspect of the case or even a grave complication, but it was of such amount that it was considered important to the welfare of the patient. A story of hematemesis and melena described as noted previously was considered evidence of bleeding. In many cases study of the stomach contents and stool by direct examination or by chemical tests confirmed the information obtained from the patient. When the history could be traced to what was considered unmistakable evidence of continued ulcer activity (as in the instance of a patient who, while under management, continued to bleed for thirty days with perforation during this period or of a patient who gave a history of hematemesis and melena at varying intervals for one year before entrance and who on entrance had a red blood count of 1,780,000 with perforation) we considered the patient in the group who had perforation with bleeding.

Twenty-two patients were grouped as doubtful. In their histories were such statements as "brown vomitus," "blood-streaked vomitus," "dark stools," "an occasional hematemesis" or "an occasional tarry stool." Several gave a history of bleeding, hematemesis or melena one month or more before their admission. These patients were grouped with those who had non-bleeding perforated ulcers.

The question of hemorrhage was further studied. The amount of bleeding that occurs with an ulcer varies. Patients who bleed severely enough to produce faintness, syncope, rapid pulse, weakness, pallor and signs of shock are usually sufficiently alarmed to be seen by a physician immediately. The amount of hematemesis is estimated by the patient and all too frequently greatly exaggerated. The question of melena is different. The quantity of blood can in no wise be estimated, for the patient can only say that the stool was black



Age incidence of perforated peptic ulcer

The percentage of hemorrhage varies from 1.5 to 18 in the cases reviewed, with an average of 8. From the reviews the relation of the peptic ulcer history of the patient to the hemorrhage, whether by hematemesis or melena, is not evident. Further, the relation of the hemorrhage and ulcer to perforation cannot be elicited. Whether or not one is to defend the statement "bleeding ulcers do not perforate and ulcer perforations do not bleed" depends greatly on what history can be obtained from the patient relative to ulcer activity, hemorrhage and perforation. A significant history should give the connected story of the patient

15. Deaver, John B., and Pfeiffer, Damon B.: Gastro-Enterostomy in Acute Perforated Ulcer of the Stomach and Duodenum, *Ann. Surg.* **73**: 441 (April) 1921.

16. Mitchell, Edward D., Jr.: Symptoms of Perforated Peptic Ulcer, *J. Tennessee M. A.* **29**: 419 (Nov.) 1936.

17. Blackford, John M., and Baker, Joe W.: Acute Perforating Peptic Ulcer, *Am. J. Surg.* **12**: 18-22 (April) 1931.

18. Shawan, Harold K., and Vale, C. Fremont: Acute Perforation of Duodenal Ulcer, *Ann. Surg.* **78**: 342 (Sept.) 1923.

19. Horsley, Gay W.: Report of Eight Consecutive Cases of Ruptured Gastroduodenal Ulcers, *Virginia M. Monthly* **58**: 386-390 (Sept.) 1931.

20. Morrison, William R.: Two Hundred Acute Perforated Ulcers of Stomach and Duodenum, from Boston City Hospital, *New England J. Med.* **213**: 447 (Sept. 5) 1935.

21. Singer, Harry A., and Rosi, Peter A.: The Pathogenesis of Perigastric Abscess Complicating Peptic Ulcer, *Am. J. M. Sc.* **183**: 699-693 (May) 1932.

or of a tarry consistency. Many state that they have suffered no ill effect from such hemorrhage or, at most, only weakness. A question arose as to how much bleeding is necessary to produce a tarry stool but there were no available data to answer it.

A volunteer went on a control diet of milk and cream for twenty-one days and took measured quantities of whole human blood at three day intervals. On such a regimen it was found that 10 cc. of blood caused no noticeable change in the color of the stool. From 20 to 30 cc. turned the stool a brown color which was easily differentiated from the light color of the stool with a milk and cream diet but which could have passed for a normal variation of color from that with a general diet. From 40 to 50 cc. turned the stool progressively darker, so that it would have appeared abnormal even when compared with the variation of a normal diet. However, 60 cc. was required to turn the stool indisputably tarry in color and consistency. With a general unrestricted diet the results were substantially the same, that is, 30 cc. passed as producing a normal variation in color and 40 and 50 cc. as giving a color distinctly darker than normal, but 60 cc. was required to turn it tarry black. It would seem, therefore, that the very minimum amount of blood a patient loses when he has a tarry stool would be between 50 and 60 cc. Clinically this figure probably varies con-

TABLE 1.—Sex Incidence in 361 Cases of Perforated Peptic Ulcer from 1935 to 1938 Inclusive

Sex	Total Cases	Without Bleeding	With Bleeding
Male.....	332	320	32
Female.....	8	5	3
Unrecorded.....	1	0	1
Total.....	361	325	36

siderably, for experimentally the blood was all taken at one time and only a relatively small amount of the stool turned black. Further studies on the question are being conducted and will be reported at a later date.

During the years 1935-1938 inclusive 361 patients were admitted to the Cook County Hospital with a diagnosis of perforated peptic ulcer. Of these thirty-six gave histories of bleeding and perforation. Figures for the total number of patients with peptic ulcers admitted for this period are not available. However, for the years 1937-1938, 1,352 patients were admitted with a diagnosis of peptic ulcer, 189 of whom had a perforated peptic ulcer, approximately 50 per cent of the total series for the four year period.

A summary of the differences with respect to age, sex, incidence of perforation and hemorrhage, duration of symptoms and position of the ulcer has been made.

The predominance of the male sex is marked. The ratio agrees generally with statistics from other large charitable clinics.²² However, this is in contrast to the statistics of Hale and White²³ and others quoted by Graves,²⁴ who found that perforation was twice as common in women as in men. In a recent review of autopsy records at Cook County Hospital, Portis and Jaffé²⁵ found the ratio of essential peptic ulcer lesions in male and female patients to be approximately 8:1,

22. Shawan,⁸ Blackford and others.⁴ Deaver and Pfeiffer.¹⁵ Morrison.²⁰
23. Hurst, Arthur F. and Stewart, Matthew J.: Gastric and Duodenal Ulcer, New York, Oxford University Press, 1929.
24. Graves, Amos M.: Perforated Peptic Ulcers in German Clinics, Ann. Surg. 98: 197-209 (Aug.) 1933.
25. Portis, Sidney A., and Jaffé, Richard H.: A Study of Peptic Ulcer Based on Necropsy Records, J. A. M. A. 110: 6 (Jan. 1) 1938.

respectively. Hurst and Stewart²³ found a ratio of approximately 2:1. The incidence of peptic ulcer appears to be increasing in males.

The age incidence of perforation and bleeding is of interest. The greatest number of perforations occurred in the fourth decade, although the figures for the third, fourth and fifth decades approximate one another

TABLE 2.—Age Incidence of Perforated Peptic Ulcer

Age, Years	Total Cases	Without Bleeding	With Bleeding
16-20.....	5	5	0
21-30.....	75	72	3
31-40.....	97	90	7
41-50.....	95	86	9
51-60.....	63	52	11
61-70.....	16	12	4
Over 70.....	5	3	2
Unrecorded.....	5	5	0
Total.....	361	325	36

closely. Following this peak there is a sharp decline to the base line. Bleeding with perforation reached its highest incidence in the sixth decade, approximately twenty years after the incidence of the greatest number of perforations. Arteriosclerosis, either general or localized, is the most probable cause for this variation.

A total of 152 perforated ulcers were found in the stomach. Of these 136 occurred as perforation with no bleeding. Sixty-one were located on the anterior surface of the pylorus and prepylorus, twenty-eight on the lesser curvature of the stomach and four on the posterior wall of the pylorus. Forty-three ulcers were listed as unclassified because the description of the location was ambiguous. While it was felt that the lesion was located on the anterior surface of the pylorus and prepylorus most often, it was not definitely so stated. Sixteen occurred with perforation and bleeding. Nine were situated on the anterior surface of the pylorus and prepylorous, three on the lesser curvature of the stomach and, again, four were unclassified.

TABLE 3.—Site of the Ulcer

	Without Bleeding		With Bleeding
	Number	Per Cent	
Stomach			
Anterior wall pylorus.....	61	44.9	9
Lesser curvature.....	28	20.6	3
Posterior wall pylorus.....	4	3.0	0
Unclassified*.....	43	31.5	4
Total.....	136	100.0	16
Duodenum			
Anterior wall.....	105	60.8	8
Posterior wall.....	7	4.0	0
Second portion.....	2	1.2	1
Unclassified*.....	58	34.0	7
Total.....	172	100.0	16
" " " " " "	10	....	2
" " " " " "	4	....	1
" " " " " "	3	....	1

* "Unclassified" included terms such as "duodenal ulcer" "peptic ulcer" and "gastric ulcer" without specific description as to its location; that is, the description was equivocal.

A total of 188 perforated ulcers were found in the duodenum, 172 of which occurred as perforation without bleeding. The anterior surface was perforated 105 times, the posterior wall seven times and the second portion twice. Again, fifty-eight were listed as unclassified. Sixteen ulcers perforated and bled. Eight of these occurred on the anterior surface of the duodenum and one on the second portion, and seven were unclassified.

Twelve patients were treated medically, ten for perforation without bleeding and two for perforation and bleeding. Five patients were recorded as having peptic ulcers, four with perforation and no bleeding and one with perforation and bleeding. Four patients were found to have a perigastric abscess, one of whom bled.

There were more ulcers located on the anterior surface of the stomach (nine) and duodenum (eight) that perforated and bled than elsewhere. The ratio of perforation to perforation and bleeding appears to be approximately the same for the ulcers that are located on the anterior wall and for those on the lesser curvature of the stomach. However, one should not lose sight of the fact that many more ulcers are located on the lesser curvature than on the anterior surface of the stomach. This ratio, then, has little significance.

There are certain anatomic peculiarities about the anterior wall of the pylorus and the first portion of the duodenum, where the great majority of perforating ulcers occur. The areas immediately proximal and distal to the pylorus possess a deficient circulation.²⁶ The arteries of the submucosa in the pyloric region of the inferior portion of the lesser curvature are practically terminal vessels and are sparsely distributed, thus giving a limited blood supply to this area.²⁷ These arteries are tortuous, anastomose infrequently and are

to be of value at present. The deficiency in blood supply perhaps explains the frequency of perforation on the anterior surface of the stomach and duodenum. Hemorrhage occurred in approximately 13 per cent of the perforations of the stomach and 8 per cent of the perforations of the duodenum. This may be explained when the relative variation that may occur in the blood supply to these areas is known.

PATHOLOGIC CONSIDERATIONS

Thirteen patients who had perforation without bleeding came to autopsy. Eight had a single ulcer on the anterior surface of the first part of the duodenum. Two had single ulcers on the lesser curvature of the stomach. One patient had three ulcers, of which two were on the anterior surface of the stomach and the third was on the posterior surface of the duodenum. One patient had two ulcers of the stomach, one on the anterior surface and the other on the lesser curvature. The last patient had two ulcers of the duodenum, of which one was on the anterior wall and the other on the posterior wall. Thus three patients had multiple ulcers.

Eight patients who had perforation with bleeding came to autopsy. Seven of these had multiple ulcers; the eighth had a single ulcer on the lesser curvature of the stomach. Of the seven patients who had multiple lesions, one had five ulcers of the stomach, two had ulcers of the stomach and duodenum coexisting and another had multiple erosions of the esophagus and a duodenal ulcer. Three patients had two ulcers of the duodenum; in each case one ulcer was located on the anterior wall and the other on the posterior wall. In two of the latter cases the perforation occurred in the anterior ulcer and hemorrhage from the posterior. The source of bleeding in the remainder was not determined.

The possibility of two or more ulcers must be borne in mind. Gastric ulcers situated on one surface of the stomach may be complicated by an ulcer on another surface of the stomach or by ulcerations elsewhere in the esophagus or bowel. Duodenal ulcers seldom occur with gastric ulcers. Perforation of an ulcer on the anterior surface of the duodenum or stomach has been followed by fatal hemorrhage from an ulcer on the posterior surface of the duodenum or stomach.³⁰ Multiple ulcers have been reported as varying from 18 to 30 per cent in series of perforated ulcers.³¹

The records of nine patients with multiple ulcers were critically reviewed for notes indicating the nature of the pathologic condition that existed prior to autopsy. For two patients surgical repair of the perforation was made. The pathologic picture of one patient was adequately described at operation and no further comment on the gross pathologic changes was made at autopsy. With regard to the other patient, a perforated ulcer located on the anterior surface of the viscus was adequately described but an ulcer located posteriorly was not mentioned.

The remaining seven patients entered the hospital in a serious condition. It was suspected that four had an ulcer perforation, but the condition of each was such that surgical treatment would have been only an added burden to their grave illness. The condition of three patients was undiagnosed. Multiple ulcers in the latter

TABLE 4.—Duration of Symptoms

Duration	Total Cases	Without Bleeding	With Bleeding
No history.....	51	48	3
Under 2 months.....	39	36	3
2-12 months.....	52	47	5
1-2 years.....	23	21	2
2-5 years.....	46	39	7
Over 5 years.....	56	50	6
Unrecorded*.....	94	84	10
Total.....	361	325	36

* "Unrecorded" includes terms like "years," "months," "a long time."

subject to powerful and repeated constrictions by the musculature of the stomach. Reeves²⁸ stated that he considered the lesser curvature as spreading out to include practically the entire pylorus. He found that because of their anatomic arrangement the arteries along the lesser curvature of the stomach and the first inch of the duodenum are predisposed to thrombosis. The branches from the arterial plexus along the lesser curvature run a highly tortuous course to enter the mucosa; therefore the resistance offered the blood stream is constantly greater and, as a result, the blood current as it enters the smaller arteries of the mucosa is slower.

The rather limited blood supply, the tortuosity of the vessels and the resistance offered the blood stream by the constrictions of the musculature predispose to thrombosis.

Wilkie²⁸ has called attention to the variability of the origin of the blood vessels supplying the duodenum. No other data could be found relative to the variation that may occur in the course of the coronary arteries or major branches thereof of the stomach and duodenum. Anson²⁹ is now conducting research on this question, but the work has not progressed far enough

26. Reeves, T. B.: A Study of the Arteries Supplying the Stomach and Duodenum and Their Relation to Ulcer, Surg., Gynec. & Obst. 30: 374 (April) 1920.

27. Einhorn, Moses: Anatomical Considerations of the Ulcer Bearing Area, Surg., Gynec. & Obst. 50: 416 (Feb.) 1930.

28. Wilkie, O. P. D.: The Blood Supply of the Duodenum with Special Reference to the Supraduodenal Artery, Surg., Gynec. & Obst. 12: 399, 1911.

29. Anson, Barry J.: Personal communication to the authors.

30. Wright-Smith, R. J.: Peptic Ulcer: An Analysis of 218 Cases Studied at Autopsy, M. J. Australia 2: 1027-1031 (Dec. 11) 1937. Raven.¹²

31. Fishback, H. R.: Personal communication to the authors. Graves.²¹ Wright-Smith.³⁰

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were not mentioned, although the bleeding from the gastrointestinal tract was a prominent part of the clinical picture.

Microscopic sections were examined in several instances. In each the chronic type of ulcer with sclerous connective tissue base was found. The muscularis was replaced by scar tissue. Round cell infiltration was noted in each section, and eosinophils were infrequent. The base was avascular, and the vessels that were situated here had thick sclerotic walls. The arteries in the neighboring submucosa, muscularis and

that when perforation occurs in the latter it is due to an unusually active process. Behrend³⁴ suggested that perforation occurs in the chronic type of ulcer with a firm sclerotic base and that hemorrhage occurs in the acute type with soft congested edges.

Fifty-one patients (table 4), or 14 per cent, gave no history of symptoms or signs of peptic ulcer prior to their admission for perforation. This is in accord with other reviews.³⁵ Further, there is little variation in the ratio of perforation with the period of symptom activity.

TABLE 5.—History, Hemorrhage and Perforation of Ulcers*

Age, Years	Sex	Duration of History	Duration of Bleeding	Hematemesis and Melena	Location of Perforation and Postmortem Observations
23	♂	4 years	1 day	Tarry stools	Duodenal ulcer
32	♂	Unrecorded	1 day	Hematemesis on admission	Anterior wall pyloroduodenal junction
38	♂	Unrecorded	1 day	Tarry stools prior to entrance	Prepyloric ulcer
46	♂	7 years	1 day	Tarry stool	Second portion of duodenum
47	♂	Unrecorded	1 day	Coffee-ground hematemesis; black stool	Anterior wall pylorus
50	♂	18 months	1 day	Stomach contents gross bleeding	Duodenum
56	♂	Unrecorded	1 day	Black or bright red stools	First part duodenum, superior surface
72	♂	Unrecorded	1 day	Black stool	Anterior wall duodenum
25	♂	6 years	1-2 days	Black, tarry stools 2-3 days	Prepyloric lesser curvature
55	♂	6 months	1 day	Melena 3 days	Anterior surface pylorus
57	♂	4 years	2-3 days	History of vomitus and aspirated blood prior to entrance	Middle third lesser curvature of stomach
34	♂	Unrecorded	3 days	Tarry stools 2-3 days	Anterior wall upper edge of duodenum
53	♂	3-4 days	3-4 days	Hematemesis, melena, vertigo, weakness	Anterior surface pyloric end of stomach
45	♂	3-4 years	4½ days	Tarry stools 7 days	Post mortem: 2 duodenal ulcers; first on anterior wall, 10 mm. diameter; second on posterior wall, 1 cm. diameter
48	♂	7 weeks	7 days	Tarry stools, occult blood 4 plus	Anterior wall pylorus
60	♂	7 years	7 years	Tarry stools 7 days	Post mortem: anterior wall duodenum, multiple erosions of esophagus
42	♂	Unrecorded	7 days	Tarry stools 7 days	First portion duodenum
55	♂	7-10 days	7-10 days	Tarry stools 7 days	Perforated peptic ulcer
35	♂	6 months	8 days	Tarry stools 7 days	Anterior wall pylorus
49	♂	5-6 years	10 days	Tarry stools 7 days	Duodenal ulcer
57	♂	Unrecorded	14 days	Tarry stools 7 days	Perigastric abscess
65	♂	2 years	14 days	Coffee-ground vomitus first, third and eighth day; tarry stool daily for seven days	Duodenal ulcer
27	♂	4 years	14 days	Tarry stools 10 days	Fluoroscope: free air under diaphragm
47	♂	Unrecorded	21 days	Hematemesis 2 weeks	Post mortem: 4 peptic ulcers; 3 gastric, 1 perforated; 1 duodenal
53	♂	3 years	21 days	Fainting 14 days; black, tarry stools	Anterior wall duodenum
33	♂	21 days	21 days	Tarry stools 2 weeks before entry	Post mortem: 2 ulcers duodenum; 1 anterior wall perforated, 1 posterior wall hemorrhage severe
53	♂	Unrecorded	Unrecorded	Coffee-ground vomitus, red blood hematemesis; tarry stools	Anterior wall first part of duodenum; 1 perforation posterior wall
73	♂	1 year	Unrecorded	Tarry stools 21 days, guaiac test 2 plus	Post mortem: 5 gastric ulcers, 1 anterior wall perforation, 4 on lesser curvature
39	♂	Unrecorded	Unrecorded	Tarry stools, 3 plus occult blood	Prepyloric ulcer
55	♂	Unrecorded	Unrecorded	Black stools, positive guaiac test	Lesser curvature duodenum
50	♂	Unrecorded	42 days	Small tarry stool	Anterior surface pylorus
64	♂	15 years	72 days	Bleeding ulcer 30 days, hospital treatment for blood loss	Anterior wall lesser curvature duodenum; gastric, anterior wall pyloric
66	♂	3 years	3 months	Vomited blood present history; tarry stools 42 days, 4 plus occult blood	Post mortem: perforation superior border stomach, saddle-shaped ulcer, also ulcers of colon
55	♂	4 months	3-4 months	Connected history vomiting blood and having black stools	One inch above pylorus
64	♂	4 years	142 days	Bloody vomitus; 2 plus benzidine in stools	Anterior surface duodenum
	♀	1 year	1 year	Black stool	Post mortem: lesser curvature of stomach, 1 cm. from pylorus
				Vomited bright red blood; occult blood in stool 4 plus	
				Recurring coffee-ground vomitus and tarry stools 1 year; red cell count 1,760,000	

* Fourteen patients (aged from 26 to 72) had a history of hemorrhage from one to six days before perforation. Nine patients (aged from 35 to 65) had a history of from seven to fourteen days' duration. Thirteen patients (aged from 27 to 73) had a history of fifteen days' duration or more.

subserosa had thickened walls. The endothelial lining often showed proliferation, and in at least two instances fairly large arteries were thrombosed. In some cases young granulation tissue was found near the edge of the ulcer. There was a gradual histologic change from the normal tissue surrounding the ulcer process to the sclerotic alterations found in the base of the ulcer. No sections indicative of an acute process were noted. This study would support those who believe perforation occurs more often in the chronic type of ulcer than in the acute.³² Dible³³ stated that bleeding is more common in the acute type than in the chronic type and

Examining the thirty-six patients with hemorrhage and perforation (table 5), it will be noted that fourteen patients had bleeding from one to six days prior to perforation. The majority of patients manifested this by the character of the stools. A few noted hematemesis. In one patient multiple erosions of the esophagus, as well as an ulcer of the duodenum, were found at autopsy. The condition of this patient at the time of entrance to the hospital was such that surgical intervention was contraindicated. The origin of the bleeding may be questioned. It may have originated from the esophageal erosions. However, from the data

32. Tammann, H., and Ludwig, H. H.: Zur Morphologie des frei perforierten Ulcus Duodeni, Zentralbl. f. Chir. 64: 2769 (Dec. 4) 1937.
Hurst and Stewart.³³ Behrend.³⁴ Wright-Smith.³⁵
33. Dible, J. Henry: The Pathology of Gastric Ulcer, Surgery 2: 675-691 (Nov.) 1937.

34. Behrend, Moses: Incidence of Hemorrhage in Perforated Gastric and Duodenal Ulcers, J. A. M. A. 95: 1889-1892 (Dec. 20) 1930.
35. Meyer, K. A., and Bruns, W. A.: Acute Perforation of Gastric and Duodenal Ulcer, Am. J. M. Sc. 171: 510 (April) 1926. Eliason and Ebeling.³⁶ Deaver and Pfeiffer.³⁷ Shawan and Vale.³⁸

reviewed, the duodenal ulcer played an important part in the production of the symptom complex. Neither the age of the patient nor the duration of the ulcer history made any difference in the tendency to hemorrhage and perforation. It occurred in all decades after the second. Nine patients noted hemorrhage from seven to fourteen days before perforation. Again, the tendency to bleeding perforation occurred with the same abandon as noted in the earlier group. Thirteen patients noted bleeding fifteen days or more prior to perforation. It is in this group that the history of intermittent or recurrent bleeding is noted. One patient who was bleeding was thought to be immune to perforation because "bleeding ulcers do not perforate." Also the multiple ulcers are found more frequently. The repeated loss of blood seems to play a part in lowering the resistance of the patient to the factors responsible for ulceration of the bowel. Sufficient bleeding to produce tarry or black stools was noted in the majority of patients prior to symptoms indicating perforation. The amount of blood lost can in no wise be determined. It would seem, then, that a patient with a known ulcer history who suddenly manifests signs of hemorrhage should be looked on as a candidate for a more serious and grave complication of ulcer—perforation.

Statistics on the incidence of hemorrhage in peptic ulcer vary considerably and for this reason are difficult to evaluate. When one adds to them the statistics on the incidence of perforation, the task becomes increasingly difficult. The total number of ulcer patients for the four year period 1935-1938 inclusive are not available. However, during this period 361 patients who had peptic ulcers with perforation were admitted, and thirty-six of them, approximately 10 per cent, had a history of bleeding preceding the perforation. For two years of the period (1937 and 1938) 1,352 patients with peptic ulcer were admitted, and of these 189 had perforation. Applying the percentages to the latter group, one finds that approximately 1 per cent of the patients with peptic ulcer bled and perforated. While this group may be too few in number for one to draw any conclusions, it might be better to say that bleeding and perforation occur in approximately 1 per cent of peptic ulcers than to say "bleeding ulcers don't perforate and ulcer perforations don't bleed."

SUMMARY AND CONCLUSIONS

Three hundred and sixty-one patients with perforated peptic ulcer that entered Cook County Hospital during the years 1935-1938 inclusive were reviewed to note the incidence of hemorrhage. Bleeding and perforation in a peptic ulcer do occur together. For the four years reviewed, bleeding was present in 10 per cent of the patients with perforated ulcer, and bleeding and perforation occurred in approximately 1 per cent of all patients admitted with the diagnosis of peptic ulcer during the years 1937 and 1938. Approximately 60 cc. or more of blood has escaped into the bowel when a patient has melena. Perforation in peptic ulcers occurred more often in males than in females. It occurred most frequently in the fourth decade, although the fifth decade showed almost the same number of cases. Bleeding and perforation occurred most frequently together in the sixth decade. Hemorrhage that follows surgical repair of a perforation should arouse suspicion that an ulcer situated elsewhere in the gastrointestinal tract may be responsible for the bleeding.

30 North Michigan Avenue.

PRIMARY TUBERCULOUS INFECTION ATTACK RATES

OBSERVATIONS FOR SELECTED LOCAL POPULATION GROUPS

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The observations reported in this paper were made recently on a total of 3,868 persons representing five different groups included in the population of Minneapolis and St. Paul (summarized in the accompanying table). The data obtained reveal the existence of wide variations in the current rates at which different groups are acquiring infections with tubercle bacilli. Analysis of these observations is undertaken for the purpose of demonstrating which of the surveyed groups experienced an exceptionally high infection rate which can be greatly reduced. The general significance of our observations presumably is proportional to the degree to which the records for each group studied are representative of the experience in comparable groups residing elsewhere.

During the course of an epidemiologic survey conducted in private practice on the personnel of a series of household units,¹ 0.1 mg. of old tuberculin was administered intradermally to 1,278 children and to 1,192 of their respective parents.

When tested at an average age of 6.4 years, 5.2 per cent of the children proved to be sensitive to tuberculo-protein. From these records it is evident that infection with tubercle bacilli had been acquired by about 0.8 per cent of the group annually. This relatively low crude annual contamination rate is used here as a standard with which the annual infection rates observed for other groups whose records appear in the table are compared. In order to facilitate these comparisons, an arbitrary value of 1 is assigned to the crude annual primary tuberculous infection attack rate² recorded for the 1,278 children surveyed in private practice.

The data for the 1,192 parents included in this study show that 57.6 per cent were sensitive to 0.1 mg. of the old tuberculin when tested at an average age of 36.3 years. According to these observations, this group of adults had acquired infection with tubercle bacilli at a crude average rate of about 1.6 per cent annually. Since the annual primary infection attack rate recorded for these parents is double the average contamination rate observed for their children, the latter apparently have been exposed to roughly one half the mean effective infection risk that the former faced. Whether these observations reflect the general trend during the past three decades in the tuberculous infection risk prevalent in Minneapolis homes of the type represented in this study or reveal a current difference in the frequency with which children and their respective parents are now being exposed to open cases of tuberculosis is an interesting and speculative question. Observations published recently by Harrington, Myers and Levine³

¹ From the Departments of Pediatrics and of Preventive Medicine, University of Minnesota Medical School.

1. Stewart, C. A.: Periodic Accrediting of Households, *Am. J. Dis. Child.* 54: 699 (Oct.) 1937.

2. The tuberculin reaction discloses primary infection with tubercle bacilli, but no comparable method for revealing reinfections has been devised.

3. Harrington, F. E., Myers, J. A., and Levine, N. M.: Significance of the Tuberculin Test, *J. A. M. A.* 108: 1309 (April 17) 1937.

provide evidence to the effect that the rate at which Minneapolis children are infected with tubercle bacilli declined appreciably during a period of ten years.

Data collected by Myers, Diehl and their associates,⁴ for 173 students who gave negative Mantoux reactions when they entered the college of education at the University of Minnesota show that 5.8 per cent became sensitive to tuberculin during their four year course of study. The average annual rate at which infections with tubercle bacilli were introduced into this series of young adults (1.5 per cent), like that (1.6 per cent) recorded for the parents included in this study, is practically double the crude primary tuberculous infection rate of 0.8 per cent obtained for the children whose records appear in the table. Although the environment of these children seems to have been safer on the average than that of students enrolled during the same decade in the college of education at the University of Minneapolis, nevertheless the tuberculous infection risk to which the latter were exposed recently probably can be rated as being comparatively low but susceptible probably to improvement.

A follow-up study conducted on 289 medical students who failed to react positively to 0.1 mg. of old tuberculin

of study and is fifty-six times the infection attack rate recorded in the table for Minneapolis children who were residing in private homes. Obviously an exceptionally high contamination risk was experienced by these medical students during their clinical or senior year.

Data have also been collected for a group of 276 student nurses who failed to react positively to 0.1 mg. of old tuberculin at the time they started a three year course of study in local private hospitals that maintain no beds for tuberculous patients. Of this group of 276 originally uncontaminated young adult girls, eighty-four, or 30.4 per cent, were found to be sensitive to 0.1 mg. of tuberculoprotein at the time of graduation. Roughly 10.1 per cent of the group had acquired infections with tubercle bacilli each year. This annual tuberculous infection rate is approximately twelve times that observed for the Minneapolis children whose records appear in the table. This observation is interpreted as evidence that a relatively high risk of acquiring infection with tubercle bacilli confronts nurses during their period of training in hospitals that maintain no special tuberculosis service. Apparently unrecognized human dissemination of tubercle bacilli are inadvertently

Crude Annual Primary Tuberculous Infection Attack Rates for Different Local Population Groups

Source of Data	Environment During Period of Observation	Total Number	Time Spent in Environment, Years	Number and per Cent Infected During Time Spent in Environment		Average Annual Increase in Infections (per Cent): "The Crude Annual Primary Infection Attack Rate"	Ratio of Each Infection Attack Rate to That Found for Minneapolis Children	Estimated Time Required for 100 per Cent of Each Group to Be Infected, Years
				Number	Per Cent			
Children.....	Private homes.....	1,278	6.4	67	5.2	0.8	1	125.0
Parents.....	Private homes.....	1,192	36.3	687	57.6	1.6	2	62.5
Students.....	College of education.....	173*	4.0	10	5.8	1.5	2	66.7
Medical students	Freshman, sophomore, junior years; no tuberculosis service	289*	3.0	24	8.3	2.8	3	25.0
Nurses training in hospitals	Senior year; 2 weeks tuberculosis service.....	265*	1.0	118	44.5	44.5	56	1.6
	No tuberculosis service.....	276*	3.0	84	30.4	10.1	12	9.9
	Six weeks tuberculosis service.....	344*	3.0	204	59.3	19.8	25	5.4
	Three months tuberculosis service.....	158*	3.0	141	89.2	29.7	37	3.4
	Six weeks tuberculosis service.....	138†	10 weeks	85	22.2	115.4	144	0.7

* Tuberculin reaction negative to 0.1 mg. of tuberculin when study was commenced.
† Tuberculin reaction negative to 1 mg. of tuberculin when study was commenced.

at the time they entered the college of medicine of the University of Minnesota disclosed that twenty-four, or 8.3 per cent, had become sensitive to this dose of tuberculoprotein by the time they had finished their junior year in school. During this three year period of study, which provided very little contact with patients and included no special tuberculosis service, 2.8 per cent of the group was infected each year. This crude annual primary tuberculous infection rate is three times that observed for the children whose records are used here as a basis for comparison.

According to the records of the Student Health Service at the University of Minnesota, 265 of the original group of 289 uninfected students continued to show negative reactions to 0.1 mg. of old tuberculin applied at the beginning of the senior year. During the last or clinical year of their course, the 265 young adults who started their senior year uncontaminated not only devoted much of their time to examining and treating patients but also spent two weeks on a special tuberculosis service. At the end of the senior year 118 members of the group were found to be sensitive to tuberculoprotein. The annual tuberculous infection rate observed for this group of medical students amounts to 44.5 per cent, which is sixteen times the annual rate noted for each of the first three years of their course

admitted to institutions of this character with appreciable frequency. If these local records provide an approximate estimate of what is taking place in private hospitals throughout the country, it seems quite obvious that an important preventable but generally unappreciated health hazard exists in institutions that knowingly admit few or no tuberculous patients for treatment. The correction of this situation probably is contingent not on refusing to admit tuberculous patients to private hospitals but rather on adopting the general policy of practicing strict aseptic nursing technic in connection with the care and treatment of each patient admitted to a private hospital until Mantoux tests applied as a routine and subsequent roentgenologic, laboratory and clinical examinations of each infected tuberculin-sensitive patient demonstrate the absence of a readily communicable form of tuberculosis, particularly open chronic pulmonary tuberculosis or phthisis.

The tuberculous infection rate recorded for the nurses training in hospitals which maintain no special tuberculosis service was distinctly lower than that observed for other student nurses whose course included a period during which tuberculous patients were given care. The records for 344 student nurses who entered training with negative reactions to 0.1 mg. of old tuberculin and spent three years in hospitals which provided six weeks training in special tuberculosis wards show that 204, or 59.3 per cent, of the group had acquired infection

4. Myers, J. A.; Diehl, H. S.; Lees, H. D., and Levine, I.: Tr. Nat. Tuberc. A., thirtieth annual meeting, Cincinnati, 1934, p. 345.

with tubercle bacilli during their three year course of study. The crude annual primary tuberculous infection rate observed for these students amounts to 19.8 per cent, which is nearly twice that recorded for nurses whose course of study provided no training in wards for tuberculous patients and is twenty-five times the rate recently experienced by Minneapolis children residing in private homes.

A follow-up study on an additional group of 158 student nurses who entered training with negative reactions to 0.1 mg. of old tuberculin and spent three years in hospitals whose course of study included three months' service in wards for tuberculosis patients disclosed that 141, or 89.2 per cent, of the group acquired infection with tubercle bacilli during a period of three years. The crude annual contamination rate observed for this group of young women is nearly three times the infection rate observed for nurses whose course included no special tuberculosis service and is thirty-seven times that recorded in the table for Minneapolis children. Attention is also called to the fact that the increases in infections recorded for the two groups of nurses who worked in wards for tuberculous patients were roughly proportional to the length of time each group spent in this type of service.

The high tuberculous infection attack rates recorded here for Minneapolis nurses whose course included a tuberculosis service are comparable to those reported by Geer⁶ for groups of nurses also engaged in caring for tuberculous patients in hospitals in St. Paul. According to the data given in the accompanying table in Geer's communications, 75.9 per cent of 158 who entered training with negative reactions to tuberculin acquired infection with tubercle bacilli during an average period of about 1.1 years. For this group of nurses the annual primary infection attack rate (69 per cent) is approximately eighty-six times the rate observed for the Minneapolis children included in this study.

Although the data that have been considered up to this point show that infections are acquired at exceptionally high rates by those engaged in the care of tuberculous patients, nevertheless these observations are open to the objection that 0.1 mg. rather than 1 mg. of old tuberculin was used as a routine in determining whether infection with tubercle bacilli was absent or present. Fortunately, however, Dr. Ruth Boynton, director of the Student Health Service at the University of Minnesota, was able to provide observations on a group of 170 nurses who gave negative reactions to 1 mg. of old tuberculin immediately before they undertook a tuberculosis service of six weeks' duration. One hundred and fifty-eight of these nurses were retested four weeks after the special tuberculosis service was terminated; thus data are available which accurately reveal the true rate at which primary infections were acquired by the group during this brief period of contact with tuberculous patients. According to the data in the table, thirty-five, or 22.2 per cent, had made the transition from the uninfected to the infected state in a period of ten weeks. These nurses, therefore, experienced a primary tuberculous infection rate, which, computed on an annual basis, amounts to 115.4 per cent. This infection rate is 144 times the infection rate observed for the children whose records are used here as a basis for comparison. Since all these contaminations probably were acquired during the six weeks spent with tuberculous patients, it seems reason-

able to attribute the 22.2 per cent increase in infections observed for these nurses to this short period of special training. When computed on this basis, the corrected annual primary tuberculous infection attack rate attributable to six weeks' contact with tuberculous patients amounts to 192 per cent, which is 240 times the contamination rate recorded in the table for Minneapolis children. The careful observations made on this group of 158 student nurses and the mutually confirmatory data for other groups whose records are included in this report are interpreted as conclusive evidence that infections with tubercle bacilli are acquired at exceptionally high rates by those who are engaged in the care of tuberculous patients. These observations also demonstrate that institutions maintained not only for the care of tuberculous patients but also for the purpose of protecting the public from contact infections by segregating disseminators of tubercle bacilli can serve as prolific centers of contagion where a large number of new human cultures of tubercle bacilli are produced annually if previously uncontaminated attendants are not given the protection of rigid aseptic measures. The serious consequences of infections acquired by students of nursing and medicine during their period of training has been reported recently by Myers and his associates.⁶

When follow-up studies disclosed the importance of the relatively unobtrusive health menace which confronts students registered in the college of medicine and nursing at the University of Minnesota, the faculty adopted measures designed to reduce this hazard to a minimum. These measures include the routine application of Mantoux tests to the professional and nonprofessional staffs of the hospital and periodic clinical and roentgenologic examinations of each tuberculin sensitive individual discovered in this manner. In addition, there was instituted the policy of observing aseptic technic in connection with the care of new hospital admissions until Mantoux tests and subsequent examinations of tuberculin sensitive patients excluded the presence of communicable forms of tuberculosis. Furthermore, a special tuberculosis service has been established by Dr. F. E. Harrington at the Minneapolis General Hospital, where attempts are being made to perfect a technic which will prevent attendants from acquiring infections with tubercle bacilli while working with tuberculous patients. The results of tuberculin tests periodically reapplied to previously uninfected persons during and after a period spent with tuberculous patients are expected to serve as an index of the efficiency of the prophylactic measures that are now being practiced. This follow-up study probably will reveal what is required to prevent those caring for patients with open cases of tuberculosis from being contaminated. The experience reported by Geer indicates that only the most rigid aseptic measures will prove adequate.

In order to obtain special information relative not only to the experience with tuberculous infection of students in other universities but also concerning precautions exercised elsewhere to keep this hazard at a minimum, a letter of inquiry was addressed to the deans of the medical schools of the United States and Canada. Replies to this communication received from forty-nine schools revealed that the problem is receiving very careful attention in some places but is largely neglected in other institutions. According to the reports

5. Geer, E. K.: Tuberculosis Among Nurses, *Arch. Int. Med.* 49: 77 (Jan.) 1932; *Am. Rev. Tuberc.* 29: 88 (Jan.) 1934.

6. Myers, J. A.; Diehl, H. S.; Boynton, Ruth E., and Trach, Benedict: Development of Tuberculosis in Adult Life, *Arch. Int. Med.* 59: 1 (Jan.) 1937. Myers, J. A.; Trach, Benedict; Diehl, H. S., and Boynton, Ruth E.: *Ann. Int. Med.* 11: 2181 (June) 1938.

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received from several universities, the high rate at which their respective students of nursing and medicine are acquiring infection with tubercle bacilli is a question of deep concern to the faculty, and definite efforts are being made to correct the situation.

Reports submitted by a few universities in which the question of tuberculosis in students of medicine and nursing has been investigated indicate that this special health problem seems to be distinctly less important in some institutions than in others, and in some instances the local tuberculous infection risk was rated as inconsequential.

A general consideration of all the information supplied by the various medical schools of the United States and Canada suggests that the study of the rate at which infections with tubercle bacilli are being acquired by students of medicine and nursing, and the development of methods designed to reduce this menace to a minimum, are in their infancy. Several universities are planning a special investigation of local conditions; thus an increasingly exact concept of the prevalence and magnitude of this special health problem and also of the measures required for its solution may soon be available.

CONCLUSION

The tuberculous infection risk prevalent in private hospitals and particularly in institutions that maintain wards for tuberculous patients constitutes a public health problem of sufficient importance to require careful investigation.

City Hall.

BURN SHOCK

THE QUESTION OF WATER INTOXICATION AS A COMPLICATING FACTOR: BLOOD CHEMICAL STUDIES AND REPORT OF AN EXTENSIVE BURN TREATED BY REPEATED TRANSFUSIONS OF BLOOD AND BLOOD PLASMA

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It is common knowledge that cases of extensive burn are likely to terminate fatally. Seldom does recovery occur from a burn which involves half the body surface, even though the burn is superficial. There are many who die from burns involving considerably less than half the body surface. This is especially true of children.

Furthermore, it is known that patients with severe burns are liable to a variety of complications such as pneumonia, nephritis, embolism, perforating ulcer of the bowel, sepsis and various other pathologic states, any of which may be contributory causes of death. We mention these only to avoid possible confusion in the discussion which follows. Our principal theme concerns the acutely fatal shock reaction which comes a few hours or a few days after the burn.

The symptoms and course of the burn shock state are variable. Too often death comes unexpectedly in

a case thought to be progressing favorably. With very large burns death comes quickly. The clinical picture is circulatory stasis progressing to a fatal termination.

The pulse becomes weak, and the blood pressure falls. The patient may be comfortable and often euphoric, so that the impending death is difficult to realize. Soon, however, the pulse cannot be palpated, the extremities become cold and livid or pallid with cyanosis, and the blood becomes thick and dark. The patient becomes stuporous and then comatose. Death terminates the picture within a few hours of the burn.

In the burned patient who lives for several days, the shock syndrome is more complicated. There may be pulmonary edema, vomiting, hyperpyrexia, progressive anasarca, convulsions and coma. Circulatory collapse terminates the course.

It is this latter group of symptoms which is usually ascribed to toxemia. The toxic theory has assumed that the burned flesh breaks down into poisonous split proteins which are absorbed into the circulation. It was this conception which led Davidson¹ to the tannic acid treatment with the thought of "fixing" toxins. Fluids were forced, to aid in the elimination. It is now known that this theory is fallacious. Certainly the treatment based on it has not prevented death from burn shock.

MECHANISM OF BURN SHOCK

The chief factor is the reaction of the capillaries to thermal injury.

Subsequent to a burn the capillaries in the injured areas dilate. The circulation stagnates, and blood plasma escapes through these injured capillaries into the tissue spaces. If the burn involves a sufficient number of capillaries the patient dies of shock due to a loss of blood fluid so rapid that nothing can be done to replace it. Intravenous fluids merely wash out into the tissue spaces. This is true circulatory shock from the mechanical loss of fluids, as reported by Blalock.² If the burn is of lesser degree, so that fluid balance can be maintained, the patient survives the immediate shock stage. The inflammatory reaction of the capillaries persists, with continued loss of blood fluid and stagnation of the circulation.

One may observe all the local and general signs of the inflammatory reaction. Locally there are redness, heat and edema. The systemic reaction comprises fever, malaise, vomiting, convulsions and the other "toxic" symptoms previously mentioned. In other words, the toxic manifestations of burns are merely the systemic effects of diffuse thermal inflammation.

The escape of fluid from the capillaries becomes generalized, extending first to the liver, lungs and other parenchymatous organs and finally to all parts of the body. Because of the obvious inspissation of the blood and the fever it is common practice to force fluids intravenously and by mouth. Burned patients are thirsty because of the fluid loss and will drink enormous quantities of water. This is especially true of children, and because of the difficulty of intravenous fluid therapy for these patients they are often encouraged to take large amounts of fluid by mouth, the idea being that fluids of all kinds are indicated and can do no harm under these conditions.

1. Davidson, E. C.: Tannic Acid in the Treatment of Burns, Surg., Gynec. & Obst. 41: 202 (Aug.) 1925.
2. Blalock, Alfred: Experimental Shock: VII. The Importance of the Local Loss of Fluid in the Production of the Low Blood Pressure After Burns, Arch. Surg. 22: 610 (April) 1931.

Dr. W. D. Gatch approved this work and assisted in the preparation of the manuscript.
From the Research Division and the Department of Surgery, Indiana University Medical Center.
Treatment demonstrated in space 488 in the Scientific Exhibit at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 15-19, 1939.

It is now known, however, that this reasoning is fallacious. When these patients are encouraged to take large quantities of water by mouth the burn shock is thereby complicated by a waterlogging of blood and tissues and by a metabolic disturbance which, for want of a better term, we have called water intoxication.

WATER INTOXICATION

Before discussing further the relation of water to burn shock it may be well to review briefly the subject of water intoxication as reported under other condi-



Fig. 1 (case 1).—A girl aged 2 years who suffered a hot water scald resting comfortably eighteen hours after treatment by the tannic acid-silver nitrate method of Bettman. On the fourth day she died in convulsions.

tions. The subject was first introduced by Rowntree³ in 1923. He had noticed a peculiar symptom complex in several patients with diabetes insipidus who continued to drink their customary large quantities of water after urinary output had been sharply reduced by solution of posterior pituitary. Rowntree then gave large quantities of distilled water to animals by mouth and observed a syndrome which he called water intoxication, characterized by progressive asthenia, muscular twitchings, convulsions, coma and death. The chief pathologic feature observed to be present was cerebral edema accompanied by a sharp reduction in the serum chlorides.

Because of the fact that enormous amounts of water are necessary to produce alarming symptoms under ordinary conditions, little or no practical importance was attached to Rowntree's observations. Later, however, it was recognized that the so-called heat cramps of engine room and furnace workers are produced by drinking large amounts of water following excessive loss of chloride in perspiration. This condition may be prevented or relieved by proper salt intake. This same mechanism is responsible, in part at least, for the condition known as heat exhaustion.

Interest in the subject of water intoxication was again aroused in 1935, when Helwig, Schutz and Curry⁴ reported a fatal case. In this instance a woman aged 50 died in convulsions thirty hours after a simple cholecystectomy. She had received by proctoclysis 9,000 cc. of water in the thirty hours.

WATER INTOXICATION IN RELATION TO BURN SHOCK

Proceeding from these introductory remarks we are now ready to present the evidence which has given us a new conception of burn shock and the blood chemical disturbances related thereto. The thought that water

intoxication may sometimes complicate burn shock came to us as the result of observations made in the following case:

CASE 1.—A girl aged 2 years was admitted to St. Vincent's Hospital, Indianapolis, on March 6, 1937, within an hour after she had fallen backward into a tub of hot water. The child was taken to the surgery and, under suitable narcosis, she was cleansed and her burns were treated by the tannic acid-silver nitrate method of Bettman.⁵ Two hours after her burn she was completely tanned and comfortable in bed. The thin black membrane constituted what seemed to be an excellent dressing for her burn, as shown in figure 1.

It was apparent that the burns were superficial, but they were so extensive that a grave prognosis was given. The subsequent treatment was that which is prescribed in modern textbooks of surgery: namely, the forcing of fluids, the giving of large quantities of fruit juices, alkalis and calcium by mouth, and the intravenous administration of physiologic solution of sodium chloride and dextrose. The question of blood transfusion was discussed, but no blood was given.

Under this management the patient's condition seemed good for forty-eight hours. She asked for and was encouraged to take large quantities of fluids by mouth. Physiologic solution of sodium chloride and dextrose were given intravenously in moderate amounts. Though her condition seemed good, her burned areas became edematous on the second day.

On the third day the child became stuporous but could be aroused and would take large amounts of water and fruit juice. Rapidly a generalized edema developed, and at the end of seventy-two hours she went into convulsions and remained unconscious until her death six hours later, during which time her generalized edema continued to increase. Blood drawn near the time of death showed profuse hemolysis of red cells, practically no clot formation and a blood chloride reading of 140 mg. per hundred cubic centimeters—a figure so amazingly low that the determination was rechecked.

Necropsy performed promptly after death revealed a tremendous waterlogging of all tissues with quantities of free fluid in the abdomen and chest cavities. The liver was greatly swollen, pale and hard. The heart was firm and contracted; the lungs were moist but showed no consolidation. There were petechial hemorrhages in the mucosa of the pyloric antrum of the stomach and the duodenum. Kidneys and other viscera showed little gross change. The brain was not examined, but it is logical to assume that it was involved in the generalized edema. Smear and cultures of the heart's blood were negative for bacteria. Microscopic examination of tissues revealed edema

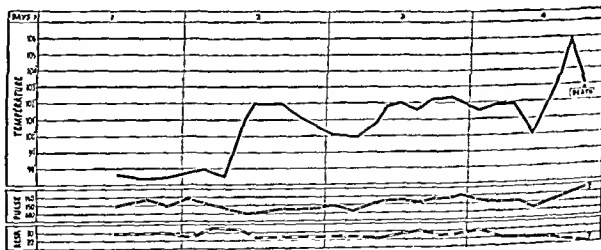


Fig. 2 (case 1).—Temperature chart.

and cloudy swelling, most apparent in the liver, which showed extreme parenchymatous damage. There was necrosis of the splenic corpuscles in varying degrees of severity. The kidneys showed cloudy swelling and parenchymatous degeneration. The corium of the superficially burned skin showed edema and capillary engorgement but no other evidence of infection.

This clinical picture obviously presents a far more profound disturbance than the water intoxication syndrome described by Rowntree. For want of a better term, however, we feel justified in assuming that this may be water intoxication superimposed on burn shock.

3. Rowntree, L. G.: Water Intoxication, *Arch. Int. Med.* 32: 157 (Aug.) 1923.

4. Helwig, F. C.; Schutz, C. B., and Curry, D. E.: Water Intoxication, *J. A. M. A.* 104: 1569 (May 4) 1935.

5. Bettman, A. G.: Tannic Acid and Silver Nitrate in Burns, *Surg., Gynec. & Obst.* 62: 458 (Feb., No. 2A) 1936.

In this case, unfortunately, blood chemical studies were incomplete. However, the extremely low terminal blood chloride level and the massive waterlogging of all tissues are positive observations of great significance.

The laking of the red blood cells is evidence of a profound disturbance in osmotic relations. The failure of the blood to clot suggests a decrease in fibrinogen associated with a great dilution of blood proteins. Also, we are inclined to postulate that the convulsions which preceded this baby's death should be ascribed to water intoxication.

EXPERIMENTAL STUDIES

This rather startling hypothesis led us to a series of studies on experimental animals (dogs). The animals were carefully selected for uniformity. They were clipped free of hair to the neck and were washed clean. Blood was drawn for determination of normal values. In order to produce definitely controlled burns, the animals were given morphine and a light ether anesthetic and immersed in water to the shoulders, the degree of burn depending on the temperature of the water and the time of immersion. After this they were kept comfortable and free from pain by adequate narcosis and careful attendance.

These animals were observed in series of five. Each member of a series received a different type of management, as follows:

- (a) No fluids given.
- (b) Water forced by stomach tube.
- (c) Physiologic solution of sodium chloride and dextrose administered intravenously in large amounts.
- (d) Acacia given intravenously in addition to solution of sodium chloride and dextrose.
- (e) Transfusions of blood given twice a day in addition to salt solution and dextrose.

The following observations were made:

1. When the burns were relatively slight all animals tended to survive irrespective of treatment. There is one notable exception to this statement. An animal with a relatively slight burn can be killed by the persistent forcing of water by mouth. When liberal quantities of water are given by stomach tube to the animal with a mild degree of burn shock it is most likely to die in convulsions. The terminal blood picture is that of water intoxication. The control animal which is made comfortable by suitable narcosis takes little or nothing by mouth. It rests and very likely survives the shock state. Moderate amounts of salt and dextrose given intravenously are perhaps beneficial but are not essential to the recovery of animals with moderate degrees of burn shock. As previously stated, they tend to recover spontaneously unless large amounts of water are administered, in which case they die usually in convulsions.

2. When the burns were too severe all animals died in shock, commonly within twelve hours. In this group blood transfusions, given promptly and repeated frequently as the shock state progressed, tended to prolong life for many hours. Salt solution and dextrose given intravenously in the absence of blood transfusions were useless for the severely burned animals. The addition of acacia was of no benefit.

3. When the burns were of critical degree but not utterly hopeless in severity we made observations as follows:

- (a) The control animals, to which no fluids were given, invariably died in shock, ordinarily within twelve hours.

- (b) The animals which received large quantities of water by stomach tube tended to survive longer than the controls but always died, usually in convulsions.

- (c) Salt solution and dextrose given intravenously in large quantities likewise tended to prolong life a few hours, during which time edema of the burned areas increased rapidly. Animals receiving this treatment died in shock regardless of the amount of fluid given.

- (d) The addition of acacia to the intravenous solution was ineffective in saving life.

- (e) The animals which received repeated large transfusions of blood in addition to salt and dextrose given intravenously were able to survive the otherwise fatal shock state. They became edematous but tended to maintain a normal blood chemical balance.

Numerous blood chemical observations were made. A detailed discussion of our experiments would be laborious and fortunately is unnecessary. We are including a few typical protocols which illustrate our observations under the stated conditions.

BLOOD CHEMISTRY⁶

PROTOCOL 1 (a).—Mild burn shock; recovery; no treatment.

No. 364, weight 12.3 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 60 C. for thirty seconds. The animal was given no treatment and survived the burn shock. There were no significant blood chemical changes at the end of fifty hours.

TABLE 1.—Blood Chemistry, Protocol 1(a)

	Normal	After 50 Hours
Hemoglobin, Gm.	14	14.5
Serum proteins, Gm.	7.1	6.8
Serum chlorides, mg.	662	643
Calcium, mg.	10.4	11.5
Sugar, mg.	85	83
Total nonprotein nitrogen, mg.	30	29

PROTOCOL 1 (b).—Mild burn shock. Death in forty-eight hours; water intoxication.

No. 365, weight 13.2 Kg. In this experiment the procedure was the same as protocol 1 (a) except that large amounts of tap water were given by stomach tube. The first convulsion occurred after twenty-four hours. The animal died in coma forty-two hours after the burn, having received 7,000 cc. of tap water.

Note the sharp reduction in blood chlorides and the dilution of serum proteins. This was fatal water intoxication superimposed on the mild burn shock.

TABLE 2.—Blood Chemistry, Protocol 1(b)

	Normal	At Death
Hemoglobin, Gm.	13	9.5
Serum chlorides, mg.	653	394
Serum proteins, Gm.	7.1	4.7
Sugar, mg.	99	56
Total nonprotein nitrogen, mg.	37	32
Calcium, mg.	11.5	9.5
Potassium, mg.	22	23

PROTOCOL 2.—Fatal burn shock.

No. 666, weight 20 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 72 C. for three minutes. It was treated by seven transfusions of 400 cc. of whole blood, each combined with similar amounts of physiologic solution of sodium chloride with dextrose. Enormous edema developed, and death occurred at the end of forty-six hours.

Blood chemical observations at death revealed a sharp increase in hemoglobin and an elevation of total nonprotein nitrogen. It is significant that though large amounts of blood were given there was no increase in total serum protein. In other words it seems that blood plasma was lost into the tissues as rapidly as the blood transfusion replaced it. The change in the albumin-globulin ratio is significant.

6. The blood chemical figures in the tables are expressed as follows: Hemoglobin and serum proteins are determined as grams per hundred cubic centimeters; serum chlorides, serum calcium, blood sugar and total nonprotein nitrogen as milligrams per hundred cubic centimeters, and hematocrit value as per cent volume of the cells in 100 cc. of blood.

TABLE 3.—*Blood Chemistry, Protocol 2*

	Normal	At Death
Red cell count, millions per cu. mm....	7.83	8.40
Hemoglobin, Gm.	15.5	25
Serum chlorides, mg.....	673	663
Serum proteins, Gm.....	6.9	6.9
Albumin, Gm.	4.1	3.5
Globulin, Gm.	2.8	3.4
Sugar, mg.	114	125
Calcium, mg.	10.8	18.3
Total nonprotein nitrogen, mg.....	30	98

PROTOCOL 3 (a).—Critical shock; no treatment; death in eleven hours.

No. 408, weight 18.8 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 72 C. for one minute. No treatment was given. The animal died in shock eleven hours after the burn.

The blood chemical changes here were essentially the same as those observed in the animal described in protocol 2, which died in shock despite transfusion of enormous amounts of blood. There were an increase in hemoglobin and a sharp increase in the hematocrit percentage, indicating an actual loss in blood plasma. The chemical observations on the plasma which remained in the vessels showed little or no change.

TABLE 4.—*Blood Chemistry, Protocol 3 (a)*

	Normal	At Death
Hematocrit, %	45	62
Hemoglobin, Gm.	12.5	18
Serum chlorides, mg.....	672	614
Serum proteins, Gm.....	5.7	5.6
Sugar, mg. ....	.....	105
Calcium, mg.	11.1	10.1

PROTOCOL 3 (b).—Critical shock; water by stomach tube; death in sixty hours.

No. 376, weight 17.5 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 72 C. for one minute. It was given 7,000 cc. of tap water by stomach tube, much of which was vomited. Death ensued after sixty hours without convulsions.

The most significant blood chemical change noted here was the sharp fall in serum chlorides, the marked reduction of sugar and the terminal increase in nonprotein nitrogen. This is the picture of water intoxication superimposed on a critical state of shock.

TABLE 5.—*Blood Chemistry, Protocol 3 (b)*

	Normal	At Death
Hemoglobin, Gm.	13	13
Serum proteins, Gm.....	7.2	6.5
Serum chlorides, mg.....	672	374
Calcium, mg.	10.5	9.8
Sugar, mg.	128	26
Total nonprotein nitrogen, mg.....	37	167

PROTOCOL 3 (c).—Critical shock; physiologic solution of sodium chloride and dextrose given intravenously in large amounts; death in twenty-four hours.

No. 546, weight 28.6 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 72 C. for one minute. It was treated with 3,000 cc. of physiologic solution of sodium chloride with 5 per cent dextrose. Death ensued in twenty-four hours.

In this instance one notes the fall in the serum protein, reduction of blood sugar and terminal increase in total nonprotein nitrogen (discussed under blood chemical changes).

TABLE 6.—*Blood Chemistry, Protocol 3 (c)*

	Normal	At Death
Hematocrit, %	59	59
Hemoglobin, Gm.	16	16
Serum chlorides, mg.....	725	774
Serum proteins, Gm.....	7.2	5.4
Sugar, mg.	168	50
Total nonprotein nitrogen, mg.....	26	82

PROTOCOL 3 (d).—Critical shock; physiologic solution of sodium chloride and dextrose and 6 per cent acacia given intravenously in large amounts; death in fifty-six hours.

No. 451, weight 15.19 Kg. This animal was given morphine and a light ether anesthetic. It was then immersed to the shoulders in water at 72 C. for one minute. It was given three intravenous injections during the next thirty-two hours, each consisting of 500 cc. of physiologic solution of

sodium chloride containing 6 per cent acacia and 5 per cent dextrose. Death occurred twenty-four hours after the last injection as blood was being drawn for studies on blood chemistry. There were marked prolongation of bleeding and clotting time and hemolysis of the blood.

This experiment revealed the most marked changes in blood chemistry. Note the sharp reduction of hemoglobin, the fall in the hematocrit value, the fall in the serum proteins and the reduction in blood sugar (discussed on blood chemical changes).

TABLE 7.—*Blood Chemistry, Protocol 3 (d)*

	Normal	At Death
Hemoglobin, Gm.	15	7.5
Hematocrit, %	45	23
Serum proteins, Gm.....	7.6	3.2
Calcium, mg.	10.5	13.2
Sugar, mg.	215	61
Total nonprotein nitrogen, mg.....	26	Unsatisfactory

PROTOCOL 3 (e).—Critical shock; repeated blood transfusions; recovery.

No. 537, weight 19.5 Kg., given morphine and a light ether anesthetic. It was then immersed in water at 72 C. for one minute. This animal was given repeated transfusions, 300 cc. of whole blood plus 300 cc. of 10 per cent dextrose being administered in physiologic solution of sodium chloride. Three such intravenous injections were given the first day and one each day thereafter. The animal was killed after one week.

This subject survived the burn shock. It should be noted that blood chemical values at the time the animal was killed were essentially normal.

TABLE 8.—*Blood Chemistry, Protocol 3 (e)*

	Normal	At Death
Hematocrit, %	46	49
Hemoglobin, Gm.	13	15
Serum chlorides, mg.....	666	725
Serum proteins, Gm.....	7.1	6.0
Sugar, mg.	78	80
Total nonprotein nitrogen, mg.....	32	57
Calcium, mg.	9.6	9.0

BLOOD CHEMICAL CHANGES

The first point that we wish to emphasize is the variation in the blood picture, which depends on the degree of shock and the manner in which fluids are administered. Unless these factors are taken into account, the blood chemical values of shock have little or no significance. The physical mechanism of the shock state is obviously complicated. There are, however, two morbid phenomena which are definite: (1) circulation is stagnating and (2) blood fluids are escaping from the capillaries. This situation produces progressive degrees of blood concentration.

If no fluids are given, the blood chemical changes noted at death are those of blood concentration, as reported by Osterberg⁷ and by Underhill and others.⁸ When fluids are forced over several days' time, however, the blood chemical picture is different. The continued forcing of fluids by mouth can result in a condition of "water intoxication," which is apparent in the blood chemical picture at death. The continued intravenous administration of salt solution merely adds salt. Neither of these fluids will support life, nor will they stay in the capillaries.

When the shock state progresses rapidly, the change in chemical composition is often so slight that there may be no apparent explanation for the death of the animal. Note protocol 3 (c); critical shock terminated fatally in twenty-four hours, during which time 3,000 cc. of saline solution and dextrose was given to an animal weighing 28 Kg. The chemical changes as shown in the table seem insignificant at first thought. However there was

7. Osterberg, A. E.: Symposium on Acute Burns: Biochemical Studies, Proc. Staff Meet., Mayo Clin. 8: 121 (Feb. 22) 1933.

8. Underhill, F. P.; Carrington, G. L.; Kapsinow, Robert; Pack, G. T., and others: Blood Concentration Changes in Extensive Superficial Burns and Their Significance for Systemic Treatment, Arch. Int. Med. 22: 31 (July) 1923.

a fall in serum proteins (7.2 to 5.4 Gm.) which took place in twenty-four hours and indicated severe capillary damage with rapid washing of blood fluids into the tissue spaces. This phenomenon must of necessity cause gross disturbances in the osmotic relations of the blood and tissues. A more complete discussion of this subject will be taken up in a later publication.

The inclusion of acacia in the intravenous fluid, as shown in protocol 3 (d), gave the most bizarre chemical picture we have observed. It appears that acacia tends to maintain the osmotic pull of the blood for a sufficient length of time to permit extreme watery dilution as a result of the continued forcing of fluids in the presence of progressive capillary leakage.

Our studies indicate that repeated transfusions of blood offer the only safe means of maintaining the blood chemical balance in the shock state. There is also an indication that blood plasma alone should be given, as the red blood cells become excessive in number. When the blood fluid balance is safeguarded in this manner other fluids may be given in moderate amounts.

The frequent observation of low blood sugar values we are not yet able to explain. It impresses us, however, that this point should be considered in the treatment of burn shock.

While these experimental studies were in progress we were called on to treat an extensive burn at the Methodist Hospital in Indianapolis. There follows a report of this most unusual clinical experience

CASE 2.—A girl aged 15 was badly burned on April 23, 1938, when her evening dress caught fire from a lighted match thrown on a ballroom floor. She was admitted to the hospital shortly thereafter, at 10:30 p. m. She was given morphine, and the charred remnants of her dress were removed. This revealed extensive burns of first, second and third degree, involving

the aid of green soap. The duration of the bath was one and a half hours. Three hours from the time of the accident she was clean and comfortable in bed with sterile sheets and dressings moistened with saline solution. Her general condition was good, but the large size of her burn gave a bad prognosis.

Our first concern was the proper balancing of her fluid intake. Blood donors were typed at once. She was given 500 cc. of physiologic solution of sodium chloride containing

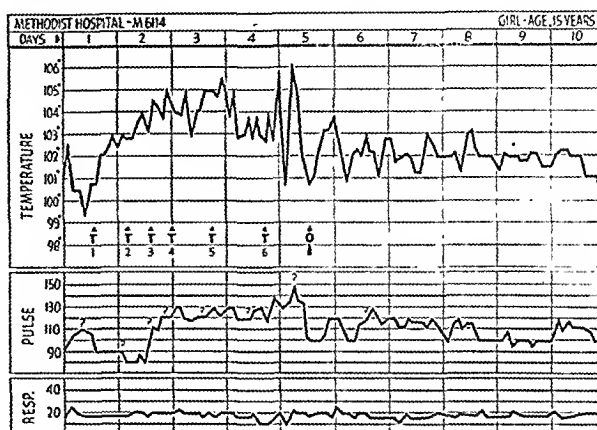


Fig. 4 (case 2).—Temperature chart. Small black triangles indicate blood transfusions. In the fourth and sixth, citrated blood plasma was given. The arrow indicates the beginning of five days in an oxygen tent. The question marks on the pulse curve are explained in the report of the case.

5 per cent dextrose. Fluids by mouth were limited. She was to have a total fluid intake of not more than 3,000 cc. in twenty-four hours. Of this, approximately 1,000 cc. was to be given by mouth as liquid diet, chiefly orange juice containing dextrose, and water administered frequently in small amounts. In addition she was given calcium gluconate at frequent intervals. For her thirst she was permitted to rinse her mouth and throat as often as she desired with cool water. The remaining 2,000 cc. of fluid intake was to be administered intravenously in the form of citrated blood, physiologic solution of sodium chloride and dextrose.

The first blood transfusion was given at the end of eight hours. At this time the patient's condition was good. Her pulse, however, was soft and difficult to count with certainty. She received 500 cc. of citrated blood with 500 cc. of physiologic solution of sodium chloride. Sixteen hours later her pulse again was uncertain, and the circulation was stagnating in the burned areas. With administration of another large transfusion of blood followed by salt solution and dextrose her circulation again improved. In this manner a total of six large transfusions were given in the first four days. On each occasion additional fluids were given in the form of physiologic solution of sodium chloride, dextrose and other agents to be mentioned later. At the time of each transfusion blood was drawn for chemical study.

The urine output was never reduced to zero but definitely lagged behind the fluid intake. Daily analysis of the scanty urine showed few signs of kidney damage. The clinical course, however, was painfully stormy and difficult to control.

A few hours after her third blood transfusion the girl's condition was not good. She was flushed and plethoric, and her circulation continued to stagnate. The burned areas were progressively more edematous. Her skin was dry and hot with a temperature ranging above 104 F. There was no sign of perspiration.

The hematocrit reading was 56 per cent, the red blood count was 6,000,000 cells with 18 Gm. of hemoglobin, and the total blood proteins were 4.6 per cent.

It was this situation which suggested to us the advisability of discarding the red blood cells from the next transfusion, with the thought that blood plasma alone would best safeguard

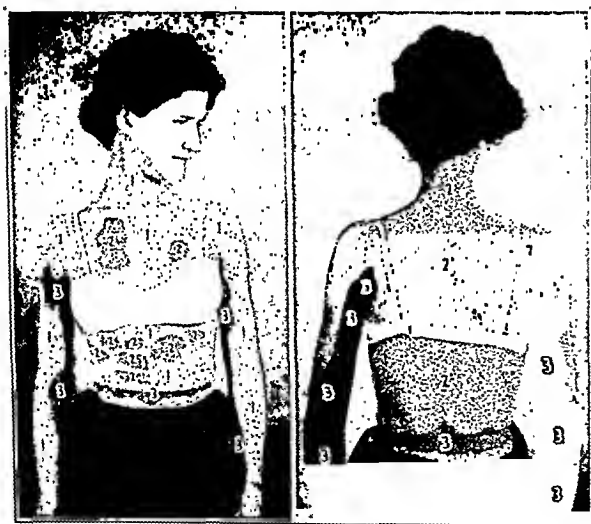


Fig. 3 (case 2).—A girl aged 15 years who on April 23, 1938, suffered an extensive flame burn, as shown by the stippling on the photographs taken one year later. Areas of first, second and third degree burn are indicated by the density of the stipple. Calculating by the method of Berkow,¹⁰ we have estimated the burn to cover 55 per cent of the body surface.

hands, arms, neck, chest, abdomen and back, as indicated in figure 3. Her face was not injured. The deepest burns involved her arms, with which she had protected her face.

After sufficient narcosis she was placed in a tub of 1 per cent salt water at body temperature and given a bath with

10. Berkow, S. G.: A Method of Estimating the Extensiveness of Lesions (Burns and Scalds) Based on Surface Area Proportions, Arch. Surg. 8:138 (Jan.) 1924.

the fluid balance. A large amount of citrated blood was drawn and 350 cc. of blood plasma was obtained by centrifuging under sterile conditions.⁹ On April 25, forty-eight hours after the burn, this citrated blood plasma was given intravenously and in addition 600 cc. of physiologic solution of sodium chloride containing dextrose and 100 cc. containing 50 per cent sucrose, a total of approximately 1,100 cc. of fluid, which constituted the fourth transfusion. After this the patient's condition was much improved, and the edema appeared to be lessened. Her temperature, however, was difficult to control. Sudden rapid rises made us fearful of a fatal hyperpyrexia. Tepid sponging of the dry skin caused chilling with no reduction of temperature. Only by means of cool retention enemas and repeated colonic irrigations of cold physiologic solution of sodium chloride were we able to keep her temperature below 106 F.

She was able to rest only with the aid of morphine given hypodermically in one-quarter grain (0.016 Gm.) doses alternating with pentobarbital sodium $1\frac{1}{2}$ grains (0.1 Gm.) by mouth at frequent intervals.



Fig. 5 (case 2).—The girl on Oct. 6, 1939.

Eighteen hours from the time of the fourth transfusion the girl's circulation again was stagnating, but she was conscious and alert. Any manipulation caused chilling. Her temperature was persistently high and difficult to control.

With considerable apprehension another large transfusion of citrated blood was given, followed by additional fluids as before. Circulatory stasis improved, but the edema now increased rapidly and began to involve the face and other unburned areas. The patient was showing a tendency to intravenous reaction, and for this reason further effort in intravenous therapy was postponed as long as possible. Another large amount of citrated blood was drawn, however, and placed in the refrigerator in preparation for another transfusion of plasma.

For twenty-four hours the girl was closely watched until it became evident that all the symptoms just described were increasing. Her breathing was labored, and she was flushed and stuporous. The plasma carbon dioxide was 49 per cent and the total serum protein 4.2 per cent, with a hematocrit reading above 60 per cent.

Increasing edema was accompanied by progressive stasis of capillary circulation. To combat this situation the sixth trans-

fusion was given. At 8 p. m. on April 27, four days after the burn, the patient received 350 cc. of blood plasma followed by 1,150 cc. of physiologic solution of sodium chloride containing 50 Gm. of dextrose and 1 ampule of Hartmann's solution, the latter being included because of the acidosis. This transfusion, though carefully given, was followed by a chill and rapid rise of temperature, as indicated in figure 4. With a cool colonic irrigation the temperature fell.

Three hours later there was another rapid rise of temperature, to a point above 106 F. The patient became delirious for the first time and then comatose and cyanotic, with pulmonary edema. All who saw her were convinced that she would die. A few hours later she awoke rational. She was very weak, cyanotic and dyspneic. Her pulse was fast and thready. An oxygen tent was placed over her, and the condition slowly improved.

Though she remained in a critical state for several more days there was one reassuring sign. Immediately after the last plasma transfusion the edema rapidly decreased and there was a sharp increase in urinary excretion. After five days in the oxygen tent with hypodermic administration of coramine, digitalis and other symptomatic drugs, the girl's color was good and circulatory tone was restored.

It is impossible to relate all the details of symptomatic management, nursing care and the local treatment of the burned areas. Because of the distribution of her burns the patient was unable to turn or move unassisted. A special bed was constructed to permit continuous wet dressing and frequent irrigation to her burned back, on which she had to lie. During the five days in the oxygen tent an ulcer developed on the cornea of the left eye, a distressing complication. For the management of this Dr. E. W. Dyar was responsible.

One month from the time of her burn the girl was taken home. All of her large burn was healed with the exception of several granulating areas on her arms, where the burns were deep third degree. On June 1 she returned to the hospital for three days, and her granulating areas were covered with Thiersch grafts. Two months from the time of receiving her burns she was completely healed. She has remained in good health and shows no sign of constitutional impairment.

Throughout the acute burn shock reaction this case was carefully studied. At no time did the systolic blood pressure fall below 80 mm. of mercury. At no time was the patient pulseless, although many times we could not be certain of the actual pulse rate. At these times transfusions of blood or blood plasma together with the intravenous fluids were administered. At no time was there complete anuria. During the period of her greatest edema, however, the urine output lagged far behind the fluid intake. A complete tabulation of laboratory data would be laborious and is unnecessary. With the exception of the abnormal values previously mentioned in the report, the numerous blood chemical and other laboratory reports give little or no indication of the stormy clinical course.

It is evident that this girl was in a grave state of burn shock for five days. We believe that a state of irreversible shock was prevented and that her life was saved by the repeated intravenous administration of properly balanced fluids, the most important components of which were blood and blood plasma.

Other significant therapeutic measures were the administration of oxygen, the control of temperature, proper sedation and the local treatment of her burns with mild antiseptic wet dressings and the scarlet red ointment preparation of Bettman.⁵ At no time did sepsis complicate her recovery.

COMMENT

Extensive burns present extremely complex problems in management. In this report we have related two cases, in addition to experimental observations, which

9. Drs. K. E. Thornberg, R. G. Fry and Horace Banks, pathologist, Methodist Hospital, prepared the citrated blood plasma.

have given us a new conception of the burn shock reaction. Our views, furthermore, are substantiated by numerous less complete clinical and experimental studies carried on by one of us (H. M. T.) over a period of ten years.

We are convinced that the successful treatment of burn shock depends on systemic measures and that the local treatment has little or nothing to do with this phase of the problem. There is no reason to believe that the local application of tannic acid or any other agent to the burned area is effective in preventing burn shock or in protecting the fluid balance of the body. It is unfortunate that for so many years this thought has confounded the essential requirements for burn shock therapy. Case 1 of this report shows an excellent example of this fallacy. In this instance a sterile tanned membrane was applied within two hours of the burn under ideal conditions. The patient died in convulsions on the third day.

Case 1 demonstrates in dramatic fashion what may happen to the blood chemistry when improperly balanced fluids are forced into a patient who is in a state of inflammatory shock due to an extensive burn. This baby received excessive amounts of fluids, chiefly in the form of water by mouth. The amazingly low blood chloride reading at death indicates to us a condition of water intoxication complicating burn shock. Our experimental studies substantiate this view.

We wish to emphasize the fact that the blood chemical values and the clinical course of patients in burn shock depend chiefly on the manner in which fluids are administered. Maintenance of fluid balance under such conditions presents a problem entirely different from that of the relatively simple fluid therapy required for patients who are merely dehydrated. The difference lies in the fact that burn shock results from a mechanism which causes stagnation of the circulating blood and a rapid loss of blood fluid through capillaries which are leaking into the tissue spaces. Under these conditions the forced administration of fluids is futile or even dangerous unless the blood chemical relationships are protected by repeated transfusions of blood or blood plasma.

As to prognosis and treatment, burns can be classified in three groups:

1. Relatively slight burns, in which shock is not a problem. The normal mechanisms of fluid and chemical balance may protect the patients sufficiently to permit recovery under any plan of systemic treatment or with no treatment at all.

2. Hopelessly extensive burns, in which no treatment will succeed in saving the lives of the patients.

3. Burns of critical degree, with the outcome depending greatly on the treatment; in these cases life may actually be saved by a rational therapeutic regimen.

Case 2, we believe, is an example of the third group.

In the fourth and sixth transfusions blood plasma was given with beneficial results, as previously discussed. It is interesting to note that the girl's total blood protein fell as low as 4.2 per cent, even though repeated transfusions were given. There was also a persistent acidosis; in addition the heat-regulating mechanism was profoundly disturbed, with absence of perspiration and hyperpyrexia. The patient's recovery may be explained by the fact that the fluid balance and blood chemical relationships were maintained sufficiently near normal to sustain life throughout the self-

limited period of the acute burn shock reaction. The importance of oxygen therapy should be emphasized.

It is important that burn shock be anticipated and treated by complete control of all phases of the case and by the administration of properly balanced fluids from the beginning. Any therapeutic effort is futile when once the shock state becomes irreversible.

The local treatment of large burns should be instituted entirely with the thought of preventing infection and providing for rapid healing. The importance of this is obvious, but further discussion of our views on local treatment does not come within the scope of this publication.

There are variable factors in the burn shock reaction which at present are somewhat obscure. The question of burn toxins we are not discussing at this time except to emphasize that the mechanism of death in so-called burn toxemia is secondary circulatory shock due to diffuse inflammation.

SUMMARY

1. The tannic acid theory of the treatment of burns is fallacious. There is no local application that can be expected to save life after a large burn.

2. The first cause of death due to the extensive burn is shock. There are two phases in the burn shock reaction.

- (a) The traumatic phase: Circulatory shock due to vascular stasis and the loss of blood plasma, which escapes into the tissue through capillaries injured by heat. Very large burns may be rapidly fatal by this mechanism.

- (b) The inflammatory phase: A complex syndrome in which the loss of fluid is accompanied by the other morbid processes of diffuse thermal inflammation. This accounts for the toxic manifestations.

3. The blood chemical changes of the shock state depend largely on the manner in which fluids are administered. The indiscriminate forcing of simple fluids into a burned patient is futile and may lead to profound disturbances in the physical-chemical relations of the blood.

The persistent forcing of water by mouth under these conditions may cause a fatal water intoxication.

4. The successful treatment of burn shock calls for a complex therapeutic regimen. Blood transfusions should be given early and repeated frequently throughout the self-limited period of the reaction. Other fluids should be given in moderate quantities. Large amounts of dextrose are indicated.

5. In case 2 of this report recovery followed the giving of six large blood transfusions in four days. Because of polycythemia, in the fourth and sixth transfusions citrated blood plasma was given. The importance of oxygen therapy should be emphasized.

1040 West Michigan Street.

Relief from Mosquito Bites.—Mosquito bites, while perhaps never serious in themselves, may lead to blood poisoning through scratching with the fingernails in the attempt to relieve the irritation, which is often intense. To relieve this irritation any one of the following may be applied, viz.: ammonia, glycerin, alcohol or iodine. According to Howard the most satisfactory remedy known to him is the application of moist toilet soap. He also mentions touching the puncture with a lump of indigo as affording instant relief, or touching the parts with naphthalene moth balls.—Hermes, William B.: *Medical Entomology*, New York, Macmillan Company, 1939.

THE TREATMENT OF SYPHILIS WITH SOBISMINOL MASS GIVEN BY MOUTH

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AND

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SAN FRANCISCO

The treatment of syphilis would undoubtedly be facilitated by the discovery of a bismuth preparation which is effective when taken by mouth. Proper anti-syphilitic therapy, when the medication is given by injection, requires frequent visits to the physician over a long period of time. Many patients discontinue their treatment prematurely or receive it at very irregular intervals because of the inconvenience of these visits or because of the pain of intramuscular injection. If a suitable oral bismuth preparation were available the attendance could safely be reduced and the pain of intramuscular injection avoided. It would be possible to continue anti-syphilitic therapy during periods when regular visits to the physician are not feasible or for patients who experience reactions to intramuscular therapy. Several bismuth preparations designed for oral administration have been tried without conspicuous success. In 1937 Hanzlik, Lehman and Richardson¹ introduced a product called sobisminol into the therapy of syphilis. This drug may be administered either orally or intramuscularly, and the purpose of the present paper is to report the clinical results obtained with sobisminol mass when given by mouth.

Sobisminol mass² is given in capsules, each containing 0.2 Gm. of sodium bismuthate, 0.4 Gm. of triisopropanolamine and 0.1 Gm. each of propylene glycol and ethyl alcohol. The bismuth content of each capsule is 0.15 Gm. Hanzlik and his staff³ have shown that this product is readily absorbed from the gastrointestinal tract in experimental animals and also in man. They have demonstrated that it is well tolerated in doses sufficient to produce and maintain a urinary excretion equal to or greater than that usually obtained with intramuscular injections of bismuth. These observations, which were confirmed by Sollmann, Cole and Henderson,⁴ indicate that sobisminol mass should be a potent anti-syphilitic agent. The clinical effects of this preparation have been reported only with regard to disappearance of surface spirochetes and the healing of cutaneous lesions. In these respects it was highly satisfactory.

Syphilis is a chronic infectious disease in which the prognosis without treatment is practically unknown but which often remains entirely asymptomatic throughout

life. Since the final criterion of the effectiveness of any therapeutic agent is the ultimate clinical outcome, it is impossible to evaluate any anti-syphilitic drug completely without an observation period of many years. We are therefore forced to rely on less adequate criteria. However, these do become of greater value with a longer period of observation. Sobisminol mass has been used in the syphilis clinic of the Stanford University Medical School for the last three years. During this time we have been able to evaluate in some respects the therapeutic effect of this preparation, but we do not feel that we have finally assessed its true worth.

There were 143 patients whose records were complete enough to be of use in the evaluation of sobisminol mass. In an additional forty-nine patients only data on tolerance were obtained. Each patient attended the clinic at intervals of one or two weeks, at which time he was carefully questioned as to tolerance and the clinical response was noted. Every effort was made to determine at each visit the exact number of capsules ingested during the preceding interval from the patient's story and the number of capsules dispensed. The daily dose estimated in this way is much nearer to the amount actually ingested than the prescribed dose would be. In this report the estimated dose will be used unless the prescribed dose is specified.

TABLE 1.—The Concentration of Bismuth in the Urine with Various Doses of Sobisminol Mass When Determinations on Separate Single Specimens Are Averaged

Sobisminol Mass Ingested (Grams per Day)	Mean Excretion (Milli- grams per Liter)
0.26 to 0.75.....	3.1
0.76 to 1.25.....	2.6
1.26 to 1.75.....	3.2

It would be desirable to have another more objective method of determining the amount of sobisminol mass taken, and measurement of the amount of bismuth excreted in the urine has been suggested for this purpose. Such determinations should be done on the total urinary output, but this is not feasible in ambulatory patients who make only occasional visits to the doctor. It is therefore necessary to rely on single specimens in the hope that the concentration of bismuth in these may parallel the total excretion and indicate the amount of sobisminol mass ingested. Hanzlik⁵ and Sollmann⁴ and their co-workers demonstrated an increase in the average amount excreted with higher doses, but both observed wide daily variations.

All our patients were requested to leave specimens of urine for bismuth analysis on every visit to the clinic. The bismuth determinations were carried out in the department of pharmacology by Dr. A. J. Lehman and Dr. Walton Van Winkle Jr., first by a long quantitative method⁶ and later by a shorter clinical method.⁷

The concentration of bismuth in single specimens of urine ranged between 0 and 24 mg. per liter. Individual observations varied widely in different patients and also

From the Division of Dermatology and Syphilology of Stanford University School of Medicine.

1. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Sodium Bismuthate Soluble, *Am. J. Syph., Gonorr. & Ven. Dis.* 21:1 (Jan.) 1937.

2. The sobisminol mass used in this study was supplied by the Cutter Laboratories, Berkeley, Calif.

3. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, Walton, Jr.: Gastrointestinal Administration of Sobisminol: Absorption, Distribution and Excretion of Bismuth, *J. Pharmacol. & Exper. Therap.* 62:54 (Jan.) 1938. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Sobisminol: Toxicity, Tolerance and Irritation According to Different Channels of Administration, *ibid.* 62:372 (April) 1938. Hanzlik, P. J., and Lehman, A. J.: Continued Voluntary Drinking of Sobisminol: General Effects, *ibid.* 62:389 (April) 1938. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Excretion of Bismuth After Intramuscular Injection of Sobisminol: Experimental and Clinical Results, *ibid.* 62:404 (April) 1938. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Excretion of Bismuth After Intramuscular Injection of Sobisminol: Experimental and Clinical Results, *ibid.* 62:404 (April) 1938. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Excretion of Bismuth After Intramuscular Injection of Sobisminol: Experimental and Clinical Results, *ibid.* 62:404 (April) 1938.

4. Sollmann, Torald; Cole, Harold; Henderson, Katherine, and others: Clinical Excretion of Bismuth, *Arch. Dermat. & Syph.* 37:993 (June) 1938.

5. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, Walton, Jr.: Clinical Excretion of Bismuth After Oral Administration of Sobisminol, *Arch. Dermat. & Syph.* 36:708 (Oct.) 1937.

6. Lehman, A. J.; Richardson, A. P., and Hanzlik, P. J.: Improved Procedures for Estimating Bismuth in Body Fluids and Tissues: *J. Lab. & Clin. Med.* 21:95 (Oct.) 1935.

7. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, Walton, Jr.: Rapid Clinical Method for Estimation of Bismuth in Urine, *Arch. Dermat. & Syph.* 36:723 (Oct.) 1937.

in repeated specimens from the same patient. Practically all patients submitted occasional specimens of urine entirely free of bismuth even though they were apparently taking sobisminol mass regularly. Bismuth determinations in single specimens of urine proved to be of no practical value in estimating the amount of sobisminol mass ingested, nor could they be relied on to detect whether or not the drug was being taken.

Since single specimens of urine seemed of no value, we have averaged the urinary bismuth concentrations when multiple observations were made on the same patient. There were 118 individuals with from five to seventy-five separate determinations, the total number being 2,442, an average of 21 per patient. The results are shown in table 1.

It is evident from table 1 that the concentration of bismuth in urine is of no value in determining whether or not sobisminol mass is being ingested. This, of course, has no bearing on the correlation between ingestion and excretion, which has been demonstrated by Hanzlik³ and Sollmann,⁴ since in our study only occasional single specimens of urine instead of the total output were utilized.

Bismuth determinations were done on thirty specimens of blood, practically all from patients on a prescribed dose of 1.8 Gm. a day. The bismuth content varied from 0 to 0.16 mg. per hundred cubic centimeters, but twenty-one of these specimens contained less than 0.01 mg. per hundred cubic centimeters. There was no apparent relation between the bismuth in the blood and the therapeutic effect.

During the early part of the study the prescribed dose of sobisminol mass was 0.6 Gm. a day (one capsule three times a day). This amount was well tolerated and it was increased later to 1.2 Gm. (two capsules three times a day) and 1.8 Gm. a day (three capsules three times a day). We believe that 0.6 Gm. is inadequate, although it was taken by too few patients for us to be sure. The optimal dose appears to be 1.2 Gm. a day. A larger quantity had no greater therapeutic effect and was not as well tolerated. Moreover, when a dose of 1.8 Gm. was prescribed this amount frequently was not taken. In more than one third of the patients given this dose the amount actually taken was less than 1.2 Gm. When 1.2 Gm. was prescribed, only one sixth of the patients took less than 1 Gm.

Sobisminol mass was well tolerated by almost all patients and no really serious reactions occurred. Thirty-seven per cent of 192 patients experienced some degree of reaction to the drug. Mild gastric disturbances were the commonest reactions, constituting 68 per cent of the total. These occurred most commonly during the first week and consisted of a feeling of fullness in the epigastrium or a sensation of hunger, occasionally accompanied by nausea and vomiting. Most patients noticed a slight increase in frequency of bowel movements but only 6 per cent actually had diarrhea. In five patients a bismuth line developed. Four others had an acute stomatitis which came on during the first few days of medication, disappeared rapidly following withdrawal of the drug and did not recur when it was resumed. An occasional patient after taking a capsule with insufficient water experienced a severe burning sensation in the esophagus that persisted for several days. A pityriasis rosea-like eruption, probably due to bismuth, occurred in three patients, and another had a toxic erythema for which no other cause could be found.

Urinalyses were made at frequent intervals and in no case was there any suggestion of renal damage. Liver function tests were not done, but there was never any clinical evidence of hepatic damage. Sobisminol mass was discontinued in five cases on account of severe gastrointestinal reactions and in five more intramuscular bismuth was substituted because we were convinced that the drug was not being taken with any degree of regularity.

The tolerance of a drug having been established, its therapeutic efficiency must be investigated. The effect of an antisyphilitic agent may be appraised in a few days by the rapidity with which it causes spirochetes to disappear from surface lesions in early syphilis. It can be estimated within a few weeks by the rate of



Fig. 1.—The appearance of lesions on the back in secondary syphilis Nov. 27, 1936.

involution of benign tertiary and early cutaneous lesions. It may be measured over a period of months by the symptomatic response in late syphilis, but only by the ultimate outcome as determined over a period of many years can it be proved.

The rapidity with which sobisminol mass caused *Spirochaeta pallida* to disappear from surface lesions was observed in thirty-three cases of seropositive primary or secondary syphilis in which neoarsphenamine was withheld for a period of two weeks. We did not feel justified in using sobisminol mass alone in seronegative primary syphilis, even for a brief period, because the prognosis is definitely better when treatment is started before the serologic reactions become positive. However, two patients failed to return for serologic reports and received only sobisminol mass for eight and ten days. The serums of both were then strongly positive. In the patients who were followed for dark field reversal, careful examinations were made on at least three prep-

arations each day. These examinations were continued in nearly every case until results of dark field examinations were negative on three successive days. No local medication was used. A few patients were given 0.6 or 1.2 Gm. of sobisminol mass daily, but 1.8 Gm. was prescribed for the majority and the average time required for the disappearance of *Spirochaeta pallida* was 4.2 days in twenty-nine cases. In the other four the result of dark field examination was still positive on the fourteenth day when neoarsphenamine was started.

The rate of involution of the lesions of early syphilis with sobisminol mass was observed in fifty-one cases. Fourteen were in the primary and thirty-seven in the secondary stage. Eleven primary lesions were completely involuted in from two to fourteen days, the average being 10.3 days. In each of the other three the involution was estimated at 90 per cent at the end of fourteen days. The secondary lesions in twenty-six cases were entirely healed in from four to fourteen days, with an average of 10.4 days. In eleven other cases the lesions had not completely healed at the end of fourteen days when neoarsphenamine was begun. At this time the average degree of involution was estimated as 70 per cent. An example of complete involution of psoriasiform secondary lesions after

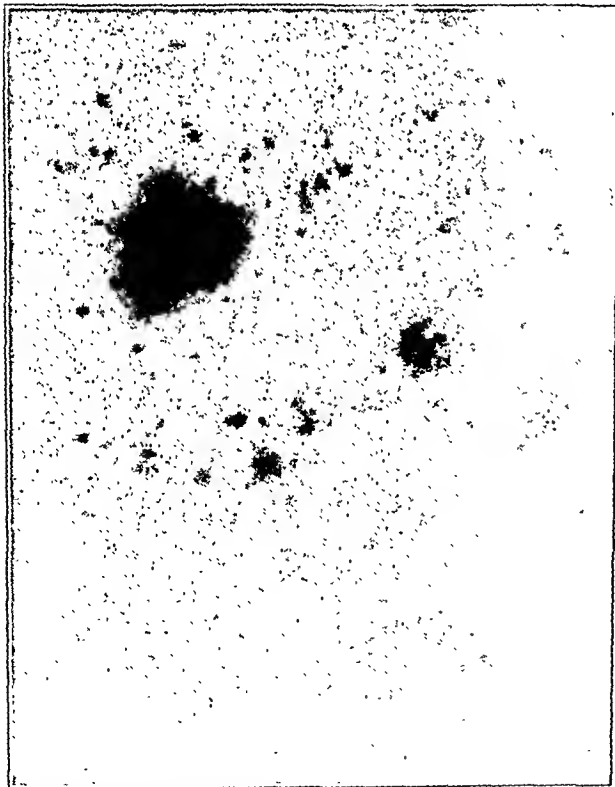


Fig. 2.—Appearance of lesions shown in figure 1 December 9, showing healing after treatment with sobisminol.

twelve days of sobisminol mass alone with an average dose of 1.65 Gm. daily is shown in figures 1 and 2. The residual pigmentation, evident in figure 2, often persists for months and was disregarded in determining involution.

The rate of involution of various types of late cutaneous lesions was determined in twenty-eight cases. Healing was complete in from one to twelve weeks,

with an average of 4.4 weeks. Since the lesions were observed at weekly intervals, the true average is probably slightly less than this. The rate of disappearance was dependent on the amount of induration and destruction and consequently varied widely. On the whole, the response was extremely satisfactory. An example of involution in a deeply ulcerated gumma is shown in



Fig. 3.—The appearance of lesions in tertiary syphilis, Oct. 15, 1936.

figures 3 and 4. At the time figure 4 was made the patient had taken an average of 1.75 Gm. of sobisminol mass daily for six weeks without other therapy.

A summary of the data on the rate of involution of lesions under sobisminol mass therapy is given in table 2.

About half of the patients were given 1.8 Gm. of sobisminol mass daily and the other half 1.2 Gm., with the exception of a very few who took 0.6 Gm. There was no discernible difference in the time of dark field reversal or of involution between any of these groups.

In seventy-three cases of late syphilis, including those presenting cutaneous lesions, treatment was initiated with sobisminol mass and was continued without other antisypilitic therapy for an average period of 4.7 months. Twenty-three patients took it for more than six months and seven for more than one year. A serologic reversal occurred in three cases, in one at four months and in another at seven months. In the third the Wassermann reaction was two plus after ten months of sobisminol mass, at which time treatment was discontinued, and the Wassermann reaction was negative three months later.

In a number of patients with late syphilis of the cardiovascular or nervous system there seemed to be subjective improvement with sobisminol mass. However, when oral medication is used instead of intramuscular injection, about which patients are likely to be quite apprehensive, one hesitates to ascribe subjective improvement to the action of the drug.

In late syphilis the only indexes of therapeutic efficiency that can be obtained in a short time are the

involution of lesions, a Wassermann reversal and subjective improvement. Many years is required for the true evaluation of an antisyphilitic drug because of the extremely variable course of the disease, and the final effect of treatment can never be determined until death has occurred.

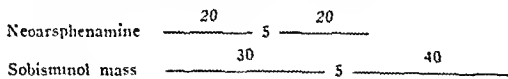
The final result in early syphilis is even more remote than in late, but certain clinical or serologic events may occur that will permit earlier evaluation of a drug. The most important of these events are Wassermann fastness, involvement of the central nervous system and serologic or clinical relapse. When these occur during treatment or after apparently adequate treatment, their frequency is a valuable index of the effectiveness of therapy.

When oral bismuth was first used, it was decided to follow the same plan of treatment for early syphilis then in effect in the clinic, except for the replacement of iodobismutol by injection with sobisminol mass by mouth. According to this plan, neoarsphenamine and iodobismutol were given simultaneously once a week for twenty weeks. Neoarsphenamine was then omitted for five weeks, after which a second course of twenty injections was given. The initial course of iodobismutol was

TABLE 2.—*The Rate of Involution of Syphilitic Lesions in Patients Treated with Sobisminol Mass*

No. of Cases	Diagnosis	Involution Complete	Average Time for Involution	Per Cent Involution in Lesions Still Present at 14 Days
11*	Primary	1-14 days	10.3 days	90%
3	Primary			
26	Secondary	4-14 days	10.4 days	70%
11	Secondary			
28	Tertiary	1-12 weeks	4.4 weeks	

continued to thirty doses and a second course of forty doses was given after an interval of five weeks. The usual dose of neoarsphenamine was 0.45 Gm. for both men and women, and that of iodobismutol was 2 cc. In the present series, instead of weekly injections of iodobismutol, sobisminol mass was given by mouth in divided daily doses of 1.2 or 1.8 Gm. during corresponding periods. The only other deviation from the original plan was the two week period in which some of the patients received sobisminol mass alone, prior to the administration of neoarsphenamine. The scheme of treatment is shown here diagrammatically, in which the figures indicate the number of weeks.



Ninety-three patients with early syphilis were given this type of therapy. Thirty-six were in the primary stage, seventeen being seronegative. Fifty-four had secondary lesions and three were early latent. Thirty-nine of these patients were followed for more than a year, nineteen for more than eighteen months but only five for more than two years. The average total period of observation was eleven months. Seventy-four were followed for more than five months and the results in these may be compared to the results that were reported by Beckh and Barnett⁸ in a similar series in which iodobismutol was administered.

There were only thirty-six patients who were initially seropositive and whose Wassermann reactions of the blood were repeated at five months, permitting comparison with the iodobismutol series. Thirty-one of these, or 86 per cent, became negative. This figure compares quite favorably with that obtained by similar treatment with iodobismutol, in which forty-six of fifty-eight, or 79 per cent, became negative.

TABLE 3.—*The Incidence of Serologic Reversal and of Cerebrospinal Fluid: Abnormalities Obtained with Sobisminol Mass Therapy in Comparison with That Obtained by Similar Treatment with Iodobismutol*

	Type of Bismuth	
	Sobisminol Mass	Iodobismutol
Number of patients.....	36	58
Seronegative at 5 months.....	31 (86%)	46 (79%)
Number of patients.....	51	43
Positive cerebrospinal fluids.....	2 (4%)	7 (16%)

The cerebrospinal fluid was examined at some time during the course of treatment in fifty-one cases. None of these showed any clinical evidence of involvement of the nervous system and only two had positive reactions of the spinal fluid. These were examined approximately six months after the beginning of treatment. Both showed a moderate pleocytosis and a slightly elevated protein content. The Wassermann reactions were positive with 1 cc. of fluid but negative with smaller quantities, and the colloidal gold curves were normal. In the series treated with iodobismutol, seven of forty-three spinal fluids gave positive reactions. These results indicate that sobisminol mass may prove to be of value in the prevention of neurosyphilis.

The incidence of serologic reversal and of cerebrospinal fluid abnormalities obtained with sobisminol mass

TABLE 4.—*The Incidence of Relapse in Early Syphilis in Patients Receiving Sobisminol Mass in Comparison with That of a Similar Group Receiving Iodobismutol*

	Type of Bismuth	
	Sobisminol Mass	Iodobismutol
Number of patients.....	74	80
Relapses.....	9 (12%)	9 (11%)
Clinical.....	8	4
Serologic only.....	1	5
Average time of relapse.....	14 months	18 months

therapy in comparison with that obtained by similar treatment with iodobismutol is summarized in table 3.

Even though the series is small, the figures in table 3 suggest that sobisminol mass is superior to iodobismutol in producing a Wassermann reversal and preventing involvement of the nervous system.

In the present series of seventy-four patients there were several who relapsed during treatment. The incidence of these relapses in comparison with that observed under similar treatment with iodobismutol is shown in table 4.

8. Beckh, Walter, and Barnett, C. W.: The Effect in Early Syphilis of Combined Treatment in Comparison with Alternating Treatment, *Arch. Int. Med.* 63: 974 (May) 1939.

Of the patients who relapsed under sobisminol mass therapy, typical cutaneous secondary lesions developed in five. Two of these had recurrences of positive Wassermann reactions coincident with a relapse, and a third was Wassermann fast. No serologic data were obtained in the other two. A positive dark field examination was obtained in only one of these patients, but all lesions involuted promptly after modification of treatment and there can be little doubt as to the accuracy of the diagnosis. In the other three cases the relapse consisted of an acute iridocyclitis. In one there was a recurrence of a positive Wassermann reaction at the time of relapse. In the other two there may be some doubt as to the diagnosis of relapse, since in one no serologic reaction was obtained and in the other the Wassermann reaction remained negative.

From table 4 it appears that the incidence of relapse is approximately the same with the two types of therapy. If the two series differed only in the bismuth

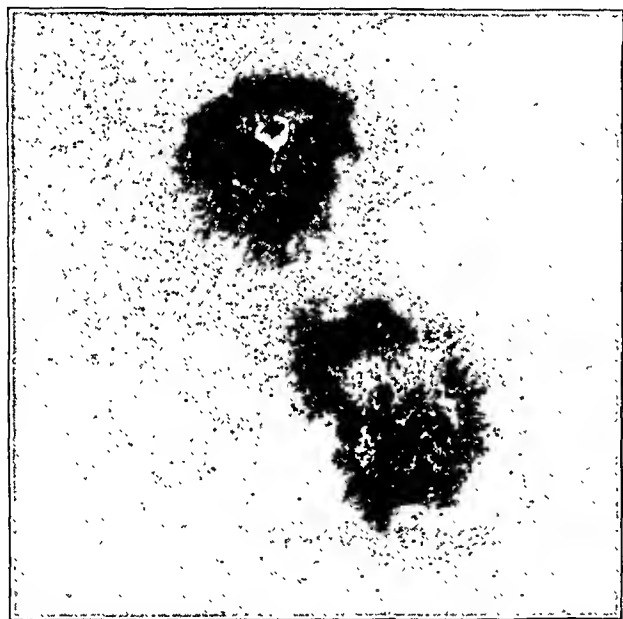


Fig. 4.—Appearance of lesions shown in figure 3 November 25, showing healing after treatment with sobisminol.

preparation used, this conclusion would be justified. There is, however, another important difference, namely the time of observation. It is improbable that many more relapses will occur in the iodobismutol group, since the majority of recurrences in early syphilis appear within two years after infection, and two years has elapsed since iodobismutol was replaced by sobisminol mass in this type of therapy. On the other hand the patients receiving sobisminol mass are still within the period of potential relapse and more clinical or serologic recurrences may be expected to appear in this group. When one considers that the average time of relapse after treatment was begun in the iodobismutol group was eighteen months and that the average total period of observation in the sobisminol mass series is only eleven months, such recurrences must be anticipated. Moreover, in the latter group only seventeen have been followed for as long as eighteen months, and of these two have already had a relapse. If the period of observation were longer, sobisminol mass would probably compare less favorably with iodobismutol in the prevention of relapse than is indicated in table 4.

In those patients who did have a relapse, an attempt was made to discover a possible explanation. Each patient was repeatedly questioned regarding the number of capsules taken, and this was checked with the amount dispensed. In no case could we prove that the drug was not being taken regularly. The excretion of bismuth in the urine was well within the average limits in every patient. There was no evident relationship between the incidence of relapse and the age, sex, diagnosis, regularity of treatment, amount of neoarsphenamine or dose of sobisminol mass. Except for the bismuth product itself, the only factor that seemed to be of importance in the production of relapse was the treatment pattern employed.

In the report of Beckh and Barnett,⁸ it was shown that this combined type of treatment was productive of more relapses than a simple alternating type, even when the same bismuth preparation was used. Had we been aware of this at the time the present study was planned, sobisminol mass would have been used in alternating courses with neoarsphenamine. However, since the present treatment was identical with the combined type except for the substitution of sobisminol mass for iodobismutol, the probable higher incidence of relapse with sobisminol mass must be ascribed to the drug and not altogether to the type of therapy.

There are obvious disadvantages in the oral treatment of syphilis. When treatment is given by injection, the physician knows not only that the patient has received the medication but the amount injected and the time of administration. When it is given orally the control is entirely in the hands of the patient, and the physician has only his word that the drug is even being taken. This disadvantage of oral medication is important in the treatment of syphilis because prolonged and uninterrupted treatment is essential. Even intelligent and conscientious patients will often admit irregularities in ingestion after a few weeks or months. Although the great majority of patients prefer oral therapy, there are a few who have little discomfort after intramuscular injection and consider frequent oral medication a nuisance. There is also the danger that the release of an effective antisypilitic drug which can be taken orally may lead to self medication.

In spite of the disadvantages, there is a definite place in the treatment of syphilis for an effective oral bismuth preparation such as sobisminol mass. Continuous treatment is essential in early syphilis and of considerable importance in late syphilis. Sobisminol mass provides a means of preserving continuity in treatment when regular visits to the physician are impossible or when severe reactions make intramuscular administration unpractical.

SUMMARY

Sobisminol mass is well tolerated when taken by mouth in therapeutically effective doses. It produces rapid involution of lesions in early and benign late syphilis and causes the disappearance of spirochetes from the surface lesions of early syphilis. It appears to reduce the incidence of involvement of the nervous system but does not prevent a clinical or serologic relapse when substituted for intramuscular bismuth in the treatment of early syphilis. It is a valuable addition to antisypilitic therapy and certainly deserves further clinical trial.

Clay and Webster streets.

SOBISMINOL MASS: CLINICAL RESULTS
WITH ORAL ADMINISTRATION

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AND

CLYDE WOOD, M.D.

LOS ANGELES

This report represents the results of the first eighteen months of our experience in the clinical use of a bismuth preparation for oral administration (sobisminol mass),¹ which has been made available through the cooperation of Professor Hanzlik of Stanford University.² It was supplied in capsules containing the reaction product of sodium bismuthate 0.2 Gm., triisopropanolamine 0.4 Gm., propylene glycol 0.1 Gm. and ethyl alcohol 0.1 Gm. This represents approximately 150 mg. of elemental bismuth. We now report clinical results in ninety cases, including cases of seropositive primary, secondary, late benign (bone, skin, mucous membrane), central nervous system (tabetic, meningo-vascular) and congenital syphilis.

GENERAL CONSIDERATIONS IN ORAL VERSUS
INTRAMUSCULAR THERAPY

There are many obvious facts which make oral administration preferable to any other type as a therapeutic procedure, but with diseases such as syphilis, because of the nature of the drugs which must be used, certain singular problems arise which require special consideration.

One of the most important major objections to oral therapy with drugs whose absorption from the gastrointestinal tract is not complete and consistent is that, since the exact amount mobilized for the circulation and tissues is not determinable, oral administration is inaccurate and is dangerous from the standpoint both of overdosage and toxicity and, with syphilis, of the opposite danger, i. e. inadequate dosage, with its well known consequences. This objection is serious and valid and deserves careful consideration.

The same criterion, however, must be applied in examining bismuth preparations used by other routes. Intravenous administration of completely soluble drugs satisfies our requirements nicely, but, on the other hand, intravenous therapy has many fundamental dangers and it is well established that intravenous administration of bismuth raises the toxicity of the drug to such a point that its use is impossible.

Let us examine, then, the conventional intramuscular administration of bismuth from the standpoint of the criterion which we applied to the oral administration of drugs.

We find that, with the exception of a few of the highly soluble preparations, most of the preparations in common use leave varying quantities at the site of injection and that in some cases, because of local reac-

tions and encapsulation or the formation of salts, the quantity may be large. We find then that, although we do know the exact amount of the drug introduced into the body, we do not know the exact amount actually mobilized in an active form. It is therefore possible to have gross underdosage with certain compounds for intramuscular administration and, in certain instances, the storage and accumulation of quantities of the drug which might under certain conditions result in serious intoxication. We find that our main objection to oral therapy with partially absorbable drugs applies equally strongly to partially absorbable drugs given into the muscle and that the depot type of treatment is far from the ideal pharmacologically.

It seems therefore that so far as accuracy is concerned (and for the present without regard for the peculiar requisites of the desirable drug in the treatment of syphilis) the drug which is completely tissue soluble is the drug of choice for intramuscular therapy and that a drug whose absorption from the gastrointestinal tract is consistent and quantitatively known is equally desirable for oral therapy.

If two such drugs were available and were shown to be equally effective in therapeutic activity, the choice would be determined by balancing the advantages and disadvantages inherent in the intramuscular route against those of the oral route. It is unnecessary to enumerate the objections to intramuscular injection, but it immediately becomes obvious that, all other things being equal, the oral route of administration is the desirable one.

ROLE OF BISMUTH IN THE TREATMENT
OF SYPHILIS

When one begins to consider the role of bismuth in the treatment of syphilis, certain factors appear which immediately make the problem of the choice of drug and the route of administration much more complex than was indicated in the previous section.

It has been generally considered that of all the attributes of the heavy metals the most important is their capacity to "build resistance" or stimulate the "defense mechanism." Thus far the knowledge of this phenomenon is meager and is best described as nebulous. Possibly a more concrete conception is to interpret this mechanism as one of "relapse prevention." Regardless of the fact that knowledge of the mechanism is slight, the observable fact remains that the important function of bismuth is not in killing spirochetes but in reinforcing the therapeutic attack in some way which makes the human organism better able to consolidate the gains brought about by the arsenical drugs. If it can be shown therefore that this effect of bismuth is altered by or in any way connected with the route of administration, it becomes apparent that the problem is not simply the question of getting a given amount of bismuth into the circulation.

One obvious question is immediately raised: Is the relapse-preventing effect of bismuth due to the fact that the depot in the muscle represents a long time supply of small quantities of previously unmobilized bismuth, or is the effect brought about by the bismuth which has been deposited in body tissues and fluids in combination with serum proteins? The answer to this question would be of greatest value in the solution of the bismuth problem. Excretion studies by many different investigators have shown that, almost regardless of the type of bismuth preparation given by muscle, approximately

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1. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Sodium Bismuthate Soluble, *Am. J. Syph., Gonorr. & Ven. Dis.* 21:1 (Jan.) 1937. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, W., Jr.: Clinical Excretion of Bismuth After Oral Administration of Sobisminol, *Arch. Dermat. & Syph.* 36:708 (Oct.) 1937; Gastrointestinal Administration of Sobisminol: Absorption, Distribution and Excretion of Bismuth, *J. Pharmacol. & Exper. Therap.* 62:54 (Jan.) 1938. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Sobisminol: Toxicity, Tolerance and Irritation According to Different Channels of Administration, *ibid.* 62:372 (April) 1938. Hanzlik, P. J., and Lehman, A. J.: Continued Voluntary Drinking of Sobisminol, General Effects, *ibid.* 62:389 (April) 1938.

2. E. R. Squibb & Sons supplied the drug.

50 per cent of the drug administered is retained in the body after the initial period of appreciable excretion and that the retained portion is excreted in almost immeasurable quantities over a prolonged period. This seems to be true even of those highly absorbable drugs which are known to leave the injection depot almost completely within a very short period (days or weeks). During the period of appreciable excretion, therapeutic activity such as spirocheticidal effect is easily demonstrated. The period of prolonged minor excretion (many months) is the period about which little is known but which may be the crucial and significant one. In this period the bismuth is distributed to the tissues and tissue fluids and is present in minute quantities, and it is here that it may play its essential role of apparent stimulation of defense or resistance or act to prevent relapse.

It would seem therefore that this effect is due to the peculiar fact that bismuth tends to be remobilized and excreted very slowly from the tissues in which it has been distributed rather than to the fact that there is a long time depot supply. Assuming this to be acceptable it then seems that, so long as the bismuth is absorbed into the circulation and distributed to the tissues and tissue fluids in adequate amount, neither the type of preparation nor the route of administration is of fundamental importance.

The classic experiment of Kolle would suggest that such a conclusion is incorrect and that bismuth is effective only when freshly mobilized from a depot and exerts a spirochetostatic effect only so long as the depot remains in place. This would indicate that the bismuth in tissue and tissue fluid has no therapeutic effect. Levaditi is of the opposite opinion and supports the contention which we have outlined. In the meantime the question is not answered, so that we cannot make a choice on the basis of known pharmacodynamic facts.

We must turn therefore to clinical results and methods. These methods represent after all the ultimate answer to therapeutic questions but with syphilis require many years for a complete answer. In this particular situation it must require a minimum period of five years to show the ultimate therapeutic results attained by incorporating the several bismuth compounds into an otherwise similar treatment system, and only by careful study of the results of treatment can the final choice be made as to which type of bismuth is superior or whether all types are equally acceptable.

In the meantime the individual clinician must decide whether he wishes to accept new drugs and methods which show great promise but which are yet unproved, or to continue using drugs and methods which admittedly can be improved but which time has shown can produce a degree of therapeutic success.

CLINICAL RESULTS OF ORAL ADMINISTRATION

Our first reaction to the use of bismuth by mouth was that, if it should prove equally effective therapeutically, the obvious advantages would make this method of treatment the one of choice. After our brief experience with this type of treatment we gained the following definite impressions:

Advantages:

1. The majority of patients prefer taking capsules by mouth three times a day to intramuscular injection once a week.
2. The drug can be used by persons who do not absorb bismuth from the muscle.
3. Apparently no depots are formed, and we did not find any evidence of cumulative toxic effects.

4. Management of a large number of patients in the clinic would be greatly facilitated and probably less expensive, since no apparatus for treatment is required.

5. Patients tend to be more regular in their treatment because many of them greatly fear the injection, with its attendant pain and discomfort.

6. Treatment accidents such as abscess and embolism are precluded.

Disadvantages:

1. The success of the treatment is directly dependent on the intelligence and cooperation of the patients, many of whom forget or neglect to take their capsules regularly because of various unimportant reasons.

2. A small number of patients are unable to tolerate treatment by mouth because of serious gastric intolerance.

3. There is a rather high incidence of gastrointestinal reaction which, although mild, tends to discourage patients during the early weeks of treatment.

4. Because of absence of depots, this method of treatment does not have any sustained effect, as shown by the fact that several patients with early involvement showed relapses within two weeks after treatment was discontinued.

5. The fundamental objection to all oral treatment holds true here, i. e. that the amount of the drug actually assimilated is not easily determined and apparently varies from day to day, depending on the functional state of the gastrointestinal tract.

Dosage: Early in this study we used nine capsules of sobisminol mass daily as a standard dose. This represented 1.25 Gm. of bismuth. Later on it was found that six capsules, or about 0.84 Gm. of bismuth, daily seemed to be just as effective therapeutically and to be somewhat better tolerated, and this was used as the standard dose thereafter.

DESIDERATA FOR NEW BISMUTH COMPOUND

Keeping in mind that the prime criterion by which to judge a drug in the treatment of syphilis is the ultimate long time results, as suggested previously, but unable because of certain circumstances operating in this clinic to incorporate bismuth given orally into our treatment of early syphilis as the sole heavy metal, we have had to content ourselves with observing its effects in relation to the following points:

1. Does it reach the blood stream and tissues in active form in adequate amount? This was studied by observing the effects on active observable lesions of all types.

2. How well is it tolerated and what are its toxic effects?

3. Does it have a sustained optimum therapeutic effect? This we consider to be demonstrated by sustained effect for an appreciable period after the administration of the drug was discontinued.

We have considered that the circumstances under which we have studied the drug did not allow for a significant effect on serologic reactions and therefore do not include such effect in the report.

We have chosen to demonstrate question 1 in the following manner:

Patients with seropositive primary and with secondary syphilis were given sobisminol mass orally as the initial treatment, and this treatment was continued for two weeks without the addition of any other drug. At the end of two weeks, treatment with an arsenical was begun regardless of the state of involution of the active lesion, since it was felt that any further delay would jeopardize the prognosis. On the other hand, active late benign lesions of the bones, skin and mucous membrane were allowed to go for several months if possible to allow for complete involution. Certain elderly persons with late latent syphilis and late neurosyphilis (ad-

quately treated) have also been allowed to continue with the drug for many months. Evidence of activity of the drug was measured by the rate of involution of the lesions as compared with the natural involution and that achieved with other drugs. Patients with symptomatic late neurosyphilis were chosen also to show that the drug could bring about relief of symptoms. Although these results are not objective in any sense of the word, the conditions under which results were measured allow us certain conclusions, which will be discussed later.

Question 2, on toxicity and reactions, was studied with simple statistical analysis in the usual manner.

Question 3, on evidence of sustained effect, is difficult of evaluation and probably must be interpreted differently with early and with late syphilis. From the clinical standpoint we considered that relapse and reactivation during treatment or soon after its cessation were evidence of lack of sustained effect. It should be noted that so many factors enter into this situation that any conclusions drawn are subject to question.

RESULTS OF TREATMENT

There were five cases of seropositive primary syphilis, twenty-seven cases of secondary syphilis (all types represented), twelve cases of late benign syphilis of the bones, skin and mucous membrane, twenty-three cases of syphilis of the central nervous system (mainly tabetic and meningovascular) and twenty-three cases of latent syphilis (early and late).

Seropositive Primary Syphilis.—The average period of involution was fourteen days, with extremes of ten and twenty days. The results of darkfield examination became negative in from two to eight days (average five days). Stained³ biopsy material from the lesions showed that spirochetes were present as long as twelve or fourteen days after treatment was started in some instances and long after the results of darkfield examination were negative. The spirochetes, however, were in a fragmented and deteriorated form.

Secondary Syphilis.—Of the twenty-seven patients, five were not treated to complete involution for several reasons. One responded well but on the sixth day had severe pyralism and treatment with sobisminol mass was discontinued. With the other four there was an average of 80 per cent (90, 90, 70, 60) involution in fourteen days. In twenty-two there was complete involution in an average of twelve days. This group was divided as to dose, ten patients receiving six capsules (about 0.84 Gm. of bismuth) daily and twelve receiving nine capsules (1.25 Gm. of bismuth) daily. The first group averaged 12.6 days and the second group 11.6 days for complete involution.

The slight increase in effectiveness achieved with the higher dose seemed to be counterbalanced by a definite increase in gastrointestinal reactions and did not seem to warrant using the higher dose as a routine. In almost all the other groups we found the same situation to hold true, i. e. that the higher dose gave only slightly better results and did not justify the increased incidence of reactions.

Late Benign Syphilis of the Bones, Skin and Mucous Membrane.—Of nine patients with cutaneous syphilis, eight had the nodulo-ulcerative and one the palmar squamous form; of the two with syphilis of the mucous membranes, one had gumma of the palate (congenital,

tardive) and one gumma of the upper lip and nasal septum. The one patient with syphilis of the bones had acute periostitis (congenital tardive).

In six of the eight patients with nodulo-ulcerative cutaneous lesions, the lesions were completely involuted in an average of thirty-one days (range from twenty-two to forty-three). Of the two whose lesions were not healed completely, the lesions of one had healed 60 per cent at the end of fourteen days, at which time treatment was inadvertently discontinued. The other patient at the time of writing had been receiving treatment forty-two days and his lesions were about 80 per cent involuted.

The squamous palmar lesion healed completely in thirty-three days.

The gumma of the palate was a large gumma of the soft palate in a 12 year old girl with congenital syphilis. This lesion healed completely in twenty days. The gumma of the upper lip and nasal septum was in a middle aged man whose syphilis was treatment resistant and relapsing. The lesion did not show any response whatever to bismuth given orally or to arsenicals but finally responded to fever therapy.

The bone lesion was acute periostitis in a child with congenital syphilis. The sobisminol mass was administered in the milk. Complete involution was achieved in forty-two days.

Syphilis of the Central Nervous System.—Sobisminol mass was given to twenty-three patients with neurosyphilis to determine whether this type of bismuth could bring about the relief of symptoms (headache, shooting pains), which we have found consistently with intramuscular administration.

The results obviously depend on the subjective reaction of the patient and therefore are not amenable to exact measurement. However, an effort was made to allow a free expression on the part of the patient, and we did not suggest possible benefits or mention specific symptoms but allowed the patient to volunteer any information he desired.

Of the twenty-three patients, five had such minor complaints that a definite effect could not be determined although in general the results were good. Of the other eighteen almost all had tabetic or meningovascular forms of long duration, all were well complaints and all had symptoms severe enough to enable them to appreciate quantitative changes. Of these eighteen, two felt no effect, fifteen felt better and one felt worse. With four the improvement was temporary, lasting less than two months, and with eleven it was prolonged, having lasted more than two months.

Of those who did get benefit, ten stated that they were almost completely relieved of all symptoms. Most of them gained weight as a result of relief from gastric disturbance and subsequent improved appetite. Five stated that they received "fair" improvement.⁴

TOXICITY AND REACTIONS

Of the ninety patients, seven complained of a bismuth line, ten of stomatitis (three of stomatitis severe enough to warrant interruption of medication), ten of "grip syndrome," thirty of nausea and vomiting, eleven of anorexia, six of diarrhea, one of dermatitis (question-

3. Chambers, S. O., and Scholtz, J. R.: Clinical Application of a Stain for Spirochetes (Krajian), Arch. Dermat. & Syph. 38: 217 (Aug.) 1938.

4. Subsequent experience has definitely confirmed the impression that sobisminol mass taken orally is unusually effective in giving symptomatic relief to patients with late neurosyphilis, particularly of the tabetic type. This effect has been very striking, immediate and lasting even with patients who had previously received large amounts of bismuth intramuscularly without relief. We consider this situation one of the particular indications for oral (sobisminol mass) therapy.

able), none of headache, four of urinary frequency, two of ptialism and parotitis and two of esophageal spasm.

Most of the complications were mild so that of the entire group only four had to discontinue treatment permanently and seven temporarily (for from one to three weeks).

One patient had a peptic ulcer. He has taken six capsules daily for seven months with no difficulty.

Two patients had severe esophageal spasm on one occasion. The pain lasted for several days and was so severe that milk and liquids were almost intolerable. One of these patients had hematemesis for two days, although the amount of blood was very small. The obvious explanation seems to be that the capsules had been held in the lower end of the esophagus long enough to dissolve and cause erosion of the mucous membrane.

Of the entire group of ninety patients forty-seven, or approximately 50 per cent, had one or more reactions. It should be noted, however, that most of these were very mild gastrointestinal symptoms (nausea) which lasted only a few hours or days at the most and did not interfere in any way with the treatment. Their importance can be compared to that of the pain and discomfort of varying degrees which most patients complain of at the time of receiving intramuscular injections but which do not last or interfere with treatment.

RENAL TOLERANCE

Urinary examinations were done for eighty-seven patients (320 specimens).

Four of the patients showed faint traces of albumin in one specimen each. One of these, a 65 year old woman, had been receiving the drug for eighteen months continuously. During this period one specimen showed a 2 plus reaction for albumin, with no other abnormalities. Subsequent examinations over a period of six months gave no further positive results.

One patient showed persistent traces of albumin for several months and granular casts on one occasion. This patient, however, had shown traces of albumin for several months before beginning oral bismuth therapy.

The other two patients each showed a 1 plus reaction for albumin on one occasion. No other abnormalities in the urine were noted. Subsequent urinary examinations on continuation of treatment gave normal results.

All the patients in this group took adequate doses of the drug during the entire period of observation.

PROLONGED THERAPY

Thirty-eight patients received the drug for two months or more without interruption. Of these, nine were unable to tolerate more than four capsules (0.56 Gm. of bismuth) daily. More than four capsules caused troublesome gastrointestinal reactions.

Five patients have been taking the drug daily for more than a year with no complaints: seven for two months, twelve for three months, four for four months, five for five months, two for six months, one for seven months, two for eight months, two for twelve months, two for fourteen months and one for eighteen months.

The incidence of reactions in this group was similar to that in the general group, i. e. most reactions occurred in the first few days or weeks and thereafter became less frequent, so that most patients had no difficulties whatever after the first two months.

The important feature therefore is that there seems to be no tendency to cumulative toxic effects. Further observation may prove otherwise.

EVIDENCE OF SUSTAINED THERAPEUTIC EFFECT

In general it can be stated that, so long as daily treatment is continued, the therapeutic effect seems to be sustained. None of our patients had relapse or progression while under treatment except the patient with gumma of the lip, who was treatment resistant from the outset.

On the other hand, from the clinical standpoint we have found certain evidence which suggests that the effect in many instances disappears rather rapidly after treatment is discontinued. In two cases of secondary syphilis, oral treatment with bismuth was carried to complete involution of the lesion (about two weeks), at which time the patients were to be given arsenical therapy. Because of nonattendance of the patients, arsenical therapy was not immediately begun and both showed reactivation of the lesions within two or three weeks.

It has also been observed that in several of our cases of symptomatic neurosyphilis the relief from symptoms is lost within a few weeks after therapy is discontinued, suggesting that a certain level of bismuth in the blood must be maintained for good results and that this level drops rapidly soon after discontinuance of oral medication.

These observations, although far from conclusive, raise an important question which should be investigated. Studies of urinary excretion in human beings will supply a partial answer, and we hope to report soon on such studies.

Sollmann and Cole⁵ in recent studies have reported that, "when the administration was stopped, the urinary excretion dropped promptly." Our yet unpublished excretion studies indicate the same conclusion.

COMMENT ON CLINICAL RESULTS

The results reported allow the following statements:

1. Sobisminol mass administered (daily) in doses containing about 0.84 Gm. of bismuth is absorbed from the gastrointestinal tract in a therapeutically active form in sufficient quantities to bring about involution of active syphilitic lesions of the skin. Involution is achieved in periods comparing favorably with those when preparations for intramuscular administration are used. The time required in cases of primary and secondary syphilis is only slightly greater than when neoarsphenamine is used.

2. Sobisminol mass (orally) in daily doses containing about 0.84 Gm. of bismuth brings relief from the symptoms of late neurosyphilis (particularly tabetic) in a high percentage of cases and appears to offer a definite advantage over any drug heretofore used.

3. Sobisminol mass (orally) is well tolerated by most patients. There is a high incidence of mild gastrointestinal reactions which rarely interfere with treatment. There are no reactions which compare in gravity to the embolism (arterial and venous) and abscess which occur with intramuscular injection with sufficient frequency to make them considerations for concern.

4. Sobisminol mass can be administered every day for many months without producing cumulative toxic effects.

5. Our material does not allow us to say that sobisminol mass (orally) can be substituted for other forms

5. Sollmann, Torald; Cole, Harold, and Henderson, Katharine: Clinical Excretion of Bismuth: V. Excretion of Sobisminol and of Some Other Bismuth Preparations for Oral Administration, Arch. Dermat. & Syph. 37: 993 (June) 1938.

of bismuth in the routine treatment of early syphilis. All circumstantial evidence points to the fact that sobisminol mass (orally) will do whatever any other bismuth preparation will do, but the ultimate proof lies in a treated series observed for several years.

6. Oral therapy has the disadvantage that its efficiency depends on the intelligence and honesty of the patient (patients are frequently lax and dishonest to their own disadvantage).

7. If oral bismuth therapy receives approval, great care must be exercised in the control of its distribution. Self medication of syphilis is worse than no medication.

CONTROL OF PROTHROMBIN DEFICIENCY IN OBSTRUCTIVE JAUNDICE

BY USE OF VITAMIN K

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Abundant experimental and clinical evidence obtained in the past four years shows that a fat-soluble substance, called by Dam vitamin K,¹ conditions the formation of prothrombin by the liver.² In obstructive jaundice at least two factors tending to depress plasma prothrombin are at work, one being damage to the liver and disturbance in its synthetic function and the other the diminished absorption of vitamin K from the intestinal tract. Bile salts have been shown to be necessary for the absorption of fat-soluble substances from the intestinal canal,³ and in obstructive jaundice the bile delivered into the duodenum may be deficient in bile salts as well as in total volume. Another factor of importance in lowering plasma prothrombin in patients with obstructive jaundice is loss of appetite with inadequate intake of foods containing vitamin K.

The data presented in this report were obtained in the management of cases of obstructive jaundice at the Massachusetts General Hospital during the past twelve months.

METHODS

Plasma prothrombin was determined by the method of Warner, Brinkhous and Smith, with modifications as previously described.⁴ The values are expressed in percentage of normal. Fibrinogen was determined in duplicate on the oxalated plasma by the method of Cullen and Van Slyke, the clot obtained from 1 cc. of plasma being subjected to microdigestion and nesslerization. Plasma bilirubin was measured as follows: Two

cc. of plasma was combined with 1 cc. of diazo reagent and allowed to stand ten minutes. Then 2 cc. of saturated ammonium sulfate and 10 cc. of 95 per cent alcohol were added. The mixture was centrifuged, and the color of the supernatant fluid was read against the cobaltous sulfate standard prepared according to McNee and Keefer.⁵ Ascorbic acid was determined in the samples of fasting plasma according to Pijoan and Klemperer.⁶ The bromsulphalein test was made in the usual way, a calibrated syringe being used to inject a measured quantity of the dye per pound and the concentration in the serum thirty minutes later being read colorimetrically against stock standards. The hippuric acid test was performed as described by Quick.⁷ A urea clearance determination was made during the same four hour period, urea in blood and urine being measured by the gasometric method of Van Slyke.⁸

Determinations of plasma prothrombin, bilirubin and fibrinogen were made repeatedly before and after operation.

The vitamin K extract used in this work was prepared from fresh spinach according to the method of Dam, as previously described.¹ One gram of the vitamin K-cholic acid mixture contained 0.45 Gm. of sodium glycocholate (Merck), 0.45 Gm. of sodium taurocholate (Merck), and 0.1 Gm. of extract derived from 200 Gm. of fresh spinach. In several instances a commercial preparation of vitamin K was used, as noted in the tables.

RESULTS

In chart 1 are shown data obtained in a case of carcinoma of the head of the pancreas before and after cholecystogastrostomy. The typical preoperative response of prothrombin to vitamin K-cholic acid

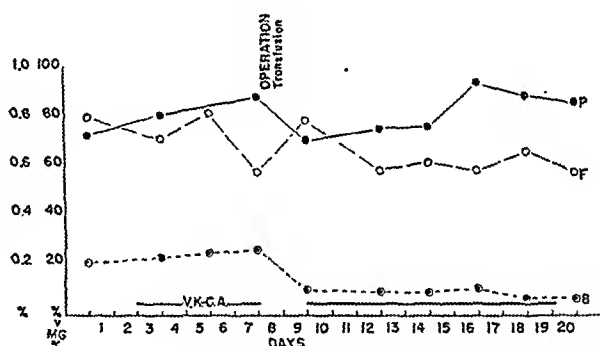


Chart 1 (J. B.).—Plasma prothrombin changes in relation to operation and administration of vitamin K-cholic acid mixture in obstructive jaundice. The mixture, 1.2 Gm. a day, was given orally as shown. P indicates plasma prothrombin concentration in percentage, F indicates fibrinogen concentration in grams per hundred cubic centimeters, and B indicates plasma bilirubin in milligrams per hundred cubic centimeters. This was a case of carcinoma of the pancreas with cholecystogastrostomy.

therapy, the postoperative drop and the secondary response are well shown. There was no abnormal bleeding in this case, as the prothrombin level was kept well above the hemorrhagic zone. Fibrinogen and prothrombin values appear to be unrelated.

The data shown in chart 2 were obtained in the study of a 73 year old patient with carcinoma of the papilla of Vater. The prothrombin value was initially at the dangerously low level of 23 per cent but responded

From the Surgical Laboratories of the Harvard Medical School at the Massachusetts General Hospital.

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1. Dam, Henrik: The Antihemorrhagic Vitamin of the Chick: Occurrence and Chemical Nature, *Nature* 135: 652 (April 27) 1935.

2. Dam, Henrik; Schönheyder, Fritz, and Tage-Hansen, Erik: Studies on the Mode of Action of Vitamin K, *Biochem. J.* 30: 1075 (June) 1936. Snell, A. M.; Butt, H. R., and Osterberg, A. E.: Treatment of the Hemorrhagic Tendency in Jaundice with Special Reference to Vitamin K, *Am. J. Digest. Dis.* 5: 590 (Nov.) 1938. Quick, A. J.; Stanley-Brown, Margaret, and Bancroft, F. W.: A Study of the Coagulation Defect in Hemophilia and in Jaundice, *Am. J. M. Sc.* 190: 501 (Oct.) 1935. Brinkhous, K. M.; Smith, H. P., and Warner, E. D.: Prothrombin Deficiency and the Bleeding Tendency in Obstructive Jaundice and in Biliary Fistula: Effect of Feeding Bile and Alfalfa (Vitamin K), *ibid.* 196: 50 (July) 1938. Stewart, J. D.

3. Greaves, J. D., and Schmidt, C. L. A.: The Role Played by Bile in the Absorption of Vitamin D in the Rat, *J. Biol. Chem.* 102: 101 (Sept.) 1933.

4. Stewart, J. D.: Prothrombin Deficiency and the Effects of Vitamin K in Obstructive Jaundice and Biliary Fistula, *Ann. Surg.* 109: 583 (April) 1939.

5. McNee, J. W., and Keefer, C. S.: The Clinical Value of the van den Bergh Reaction for Bilirubin in Blood with Notes on Improvements in Its Technique, *Brit. M. J.* 2: 52 (July 11) 1925.

6. Pijoan, Michel, and Klemperer, F. W.: Determination of Blood Ascorbic Acid, *J. Clin. Investigation* 16: 443 (May) 1937.

7. Quick, A. J.: The Synthesis of Hippuric Acid: A New Test of Liver Function, *Am. J. M. Sc.* 185: 630 (May) 1933.

8. Van Slyke, D. D.: Determination of Urea by Gasometric Measurement of the Carbon Dioxide Formed by the Action of Urease, *J. Biol. Chem.* 73: 695 (June) 1927.

rapidly to the administration of vitamin K-cholic acid mixture by mouth. Operation was performed with procaine hydrochloride anesthesia and consisted of cholecystoduodenostomy and jejunostomy. The chart shows the temporary postoperative depression in prothrombin and the rapid response to vitamin K-cholic

were being taken an improvement in plasma prothrombin concentration did not occur until the fever and jaundice subsided. The plasma fibrinogen values are interesting; they seem to vary inversely with the prothrombin concentrations. Thus with infection plasma fibrinogen rose sharply, while the prothrombin

TABLE 1.—Prothrombin Values at the Time of Massive Pathologic Bleeding Due to Prothrombin Deficiency in Obstructive Jaundice*

	Operation	Bleeding			Site	Comment
		Post-operative Day	Plasma Prothrombin, %	Cell Volume, %		
T. P. H.	Cholecystostomy, jejunostomy	4th	28.0	28.5	Urinary and biliary tracts	Severe diarrhea, ? absorption vitamin K
J. R. B.	Cholecystogastrostomy	7th	13.0	23.1	Stomach, gallbladder	Further vitamin K refused 10 days before
M. Y.	Repair of common duct	6th	31.5	34.8	Wound, gastrointestinal tract	No vitamin K
M. L. K.	Exploratory laparotomy	8th	25.0	46.9	Wound, uterus	No vitamin K after operation
H. C. K.	Cholecystostomy	16th	36.5	30.5	Wound, gastrointestinal tract	Further vitamin K refused 7 days before
R. G.	None; hepatic lymphoblastoma	....	24.1	37.5	Mouth, gastrointestinal tract	No vitamin K
P. B.	Exploratory laparotomy	7th	9.8	30.5	Wound, gastrointestinal tract	No vitamin K

* Patients had received either no vitamin K-cholic acid mixture or insufficient amounts.

TABLE 2.—Preoperative Data in Cases of Obstructive Jaundice Due to Stone in the Common Duct*

	Age	Sex	Duration of Jaundice, Wk.	Brom-sulfalein Retention, %	Hippuric Acid Excretion, Gm.	Urea Clearance, %/Av. Norm.	Fibrinogen, Gm./100 Cc.	Plasma Bilirubin, Mg./100 Cc.	Plasma Ascorbic Acid, Mg./100 Cc.	Prothrombin, Initial, %	Prothrombin After Treatment, %	Duration of Treatment, Days	Dose of Vitamin K-Cholic Acid, Gm.
L. H. S.	33	♂	8	100	5.4	102	0.48	10.1	0.51	49.8	88.8	4	3.2
E. J.	59	♂	2	100	2.6	135	0.29	40.0	0.30	59.2	102.0	4	7.5
M. A. C.	41	♀	4	70	2.0	...	...	9.9	...	42.4	96.4	5	7.4
D. F. W.	39	♀	2	25	3.1	98	...	15.0	...	35.7	83.3	2	5.5
M. L. K.	61	♂	8	100	2.1	98	...	13.1	...	70.7	100.0	5	6.0
J. F.	46	♂	1	70	4.7	98	1.08	6.0	0.64	75.6	87.2	4	3.2
E. L. D.	70	♂	2	100	3.1	48	0.68	12.4	0.60	77.8	101.1	6	↑
R. D.	35	♂	1	55	3.2	68	0.32	5.5	0.36	47.1	90.3	2	1.8
J. M. S.	63	♂	1.5	90	3.3	75	0.57	15.5	0.92	72.9	92.6	5	6.0
G. K.	71	♂	4	50	1.4	57	0.66	5.8	0.05	81.3	108.8	3	3.6
J. M. S.	34	♂	0.5	90	3.8	120	0.53	9.8	1.04	95.0	110.0	6	3.6
L. M. N.	54	♂	0.5	20	5.2	115	0.57	2.4	0.29	76.3	93.7	5	6.4
R. M.	69	♂	8	45	2.7	83	0.53	6.8	0.71	53.4	105.1	4	↑
E. T. O.	78	♂	3	109	0.6	57	0.81	15.7	0.07	60.2	72.0	3	3.6
D. P.	22	♂	1.5	50	6.7	110	0.43	0.3	0.39	68.6	100.0	3	3.6
Average	51.7		3.1	71	3.3	83.7	0.57	11.6	0.57	63.7	95.1	4.1	4.8

* Average improvement in prothrombin under treatment, 29.4 per cent.

† Received daily 6,000 units of Vitamin K (Almquist-Stokstad) and 30 grains (2 Gm.) bile salts.

‡ Received daily 3,000 units of vitamin K and 30 grains of bile salts.

TABLE 3.—Preoperative Data in Cases of Obstructive Jaundice Due to Carcinoma*

	Age	Sex	Duration of Jaundice, Wk.	Brom-sulfalein Retention, %	Hippuric Acid Excretion, Gm.	Urea Clearance, %/Av. Norm.	Fibrinogen, Gm./100 Cc.	Plasma Bilirubin, Mg./100 Cc.	Plasma Ascorbic Acid, Mg./100 Cc.	Prothrombin, Initial, %	Prothrombin After Treatment, %	Duration of Treatment, Days	Dose of Vitamin K-Cholic Acid, Gm.
J. B.	47	♂	3	55	3.4	57	0.70	19.2	0.32	71.4	86.6	5	4.0
H. C. K.	32	♀	4	90	2.7	68	0.51	11.6	0.23	71.1	95.7	4	3.2
P. W.	58	♂	5	80	5.1	63	0.50	19.6	...	58.9	96.1	3	9.0
J. R. B.	53	♂	4	70	4.4	70	...	12.5	...	83.2	100.0	6	24.8
T. P. H.	66	♂	6	100	0.2	48	...	43.5	...	28.0	56.7	2	5.4
R. M.	75	♂	7	65	1.2	62	0.73	16.3	0.22	40.5	61.1	1	0.8
E. W.	73	♂	8	90	1.2	78	0.67	14.2	0.61	23.1	91.9	9	10.8
D. N. I.	42	♂	12	85	3.8	80	0.77	8.7	1.20	69.9	79.2	4	5.2
W. T. M.	54	♂	4	100	5.8	80	0.82	21.4	0.43	67.6	81.4	9	11.2
Average	55.5		5.8	82	3.1	65.1	0.68	18.5	0.50	53.7	83.2	4.8	8.3

* Average improvement in prothrombin under treatment, 29.5 per cent.

acid given by jejunostomy. There was no abnormal bleeding, and the patient made an uneventful convalescence.

In chart 3 are seen the effects of a bout of cholangitis on prothrombin response to vitamin K-cholic acid therapy. When first studied, the patient's jaundice was of only three days' duration and the prothrombin was only slightly reduced. The subsequent retardation of response to vitamin K therapy illustrates the importance of the condition of the liver, for even though adequate amounts of vitamin K-cholic acid mixture

concentration fell even under vitamin K-cholic acid therapy.

In table 1 are shown prothrombin data at the time of massive pathologic bleeding in obstructive jaundice. The danger zone is seen to be below 40 per cent. The patients had either had no vitamin K-cholic acid mixture or else had had insufficient quantities. Proper vitamin K-cholic acid therapy resulted in rapid cessation of bleeding and elevation of prothrombin in all except three cases. The condition of R. G. and M. L. K. was hopeless, and specific therapy and study were

unjustifiable. Patient T. P. H. had severe liver failure with ascites, anuria, peripheral edema and delirium, and liver function was probably too greatly reduced to make a prothrombin response. Nevertheless, in the last-mentioned case the question is complicated by possible failure of the patient to absorb the mixture fed by jejunostomy on account of brisk diarrhea.

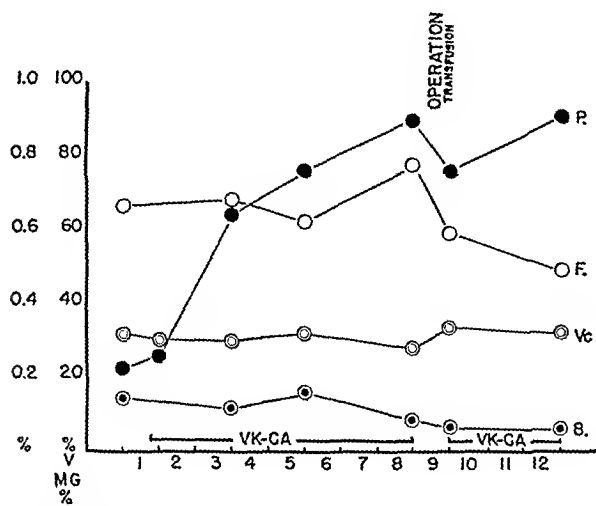


Chart 2 (E. W.).—Plasma prothrombin changes in response to administration of vitamin K-cholic acid mixture, 1.2 Gm. a day, given orally before operation and by jejunostomy after operation. This was a case of carcinoma of the papilla of Vater and cholecystoduodenostomy. *P* indicates plasma prothrombin concentration in percentage, *F* indicates fibrinogen in grams, *Vc* indicates cell volume in percentage and *B* indicates plasma bilirubin in milligrams per hundred cubic centimeters. No pathologic bleeding occurred.

In tables 2 and 3 are shown preoperative data in fifteen cases of obstructive jaundice due to stone and in nine cases due to carcinoma. The data obtained in the liver function tests are of interest in connection with the initial prothrombin response to treatment. Hard and fast conclusions are not to be drawn in such a study, but in general as compared with the patients having obstruction due to stone the patients with carcinoma were jaundiced longer, showed poorer liver and renal function, were more deeply jaundiced and had lower plasma ascorbic acid values and higher fibrinogen values. The plasma prothrombin concentration before and after treatment was definitely lower in the patients with carcinoma. In none of these cases was there failure to establish a safe prothrombin concentration as the result of preoperative treatment. In both groups the plasma ascorbic acid concentration was subnormal, which is indicative of the malnutrition so common in obstructive jaundice.

COMMENT

The uniformity with which prothrombin deficiency is found in obstructive jaundice is striking. In general terms the longer the duration of the jaundice and the greater the liver damage, the lower the plasma prothrombin concentration. Nevertheless, even as early as three or four days after the onset of biliary obstruction there may be moderate reduction in the prothrombin level, so labile is this factor. There is, on the whole, agreement between clinical appraisal of the patient's condition, the results of liver function tests and the extent of prothrombin deficiency. Further study may indicate that the prothrombin depression is a better index of liver damage than other standard liver function tests.

A question of much interest is the possibility of increasing the prothrombin value to an abnormally high level by heavy vitamin K-cholic acid feeding, with

resultant pathologic increase in clotting tendency. In none of the jaundiced patients thus far studied have abnormally high prothrombin values been observed after treatment. There seems to be a rather definite tendency for the prothrombin value to be stabilized close to normal under treatment. The question has been investigated further in a group of patients not suffering from liver disease and having normal prothrombin values. In three such patients from 1.2 to 2.4 Gm. of vitamin K-cholic acid mixture was fed daily for from six to twelve days with no significant change in prothrombin concentration. Since this is two or three times the quantity necessary to restore the level to normal in obstructive jaundice, there evidently exists a considerable margin of safety in administering the mixture.

Reduction in prothrombin of from 20 to 30 per cent is usually seen immediately after operation, probably dependent on such factors as blood loss, anoxemia, effect of anesthetic agent and cessation of intake of vitamin K. In our cases the postoperative drop occurred within the first four days. Since the prothrombin value is so labile, the importance of giving vitamin K with little delay after operation is apparent. For this reason in several instances we have performed jejunostomy at the time of operation on the biliary tract and have continued giving the vitamin without intermission. Occasionally jejunostomy is justifiable for this purpose in preparing a patient for operation, though nasal tube feeding should be tried first if the patient seems unable to take the mixture.

A question of practical importance is How necessary are frequent determinations of plasma prothrombin

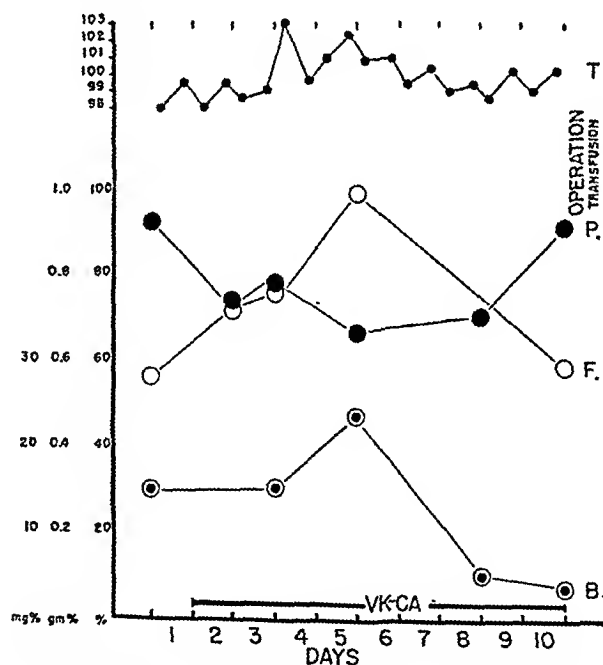


Chart 3 (J. M. S.).—Effect of cholangitis on vitamin K response in obstructive jaundice due to stone in the common duct. Vitamin K-cholic acid mixture, 1.2 Gm. a day, was given orally. *T* indicates oral temperature, *P* indicates prothrombin concentration in percentage, *F* indicates fibrinogen in grams per hundred cubic centimeters, and *B* indicates plasma bilirubin in milligrams per hundred cubic centimeters.

in treating obstructive jaundice with vitamin K-cholic acid mixture? Admittedly the determination is rather tedious and complicated and requires careful attention to details. Eventually knowledge of the subject may be sufficiently satisfactory to warrant routine administration of vitamin K-cholic acid mixture. However,

study of prothrombin concentration is highly desirable until such matters have been settled as the toxicity of vitamin K and cholic acid in obstructive jaundice, the possibility of hyperprothrombinemia, the incidence of refractory hypoprothrombinemia, the purification of vitamin K and the standardization of dosage.

Since the extent of reduction in prothrombin in obstructive jaundice and the ability to respond to vitamin K-cholic acid therapy depend on the degree of depression of liver function, an essential part of the treatment consists of measures known to aid liver function. The patient should receive from 400 to 600 Gm. of carbohydrate daily, by mouth or by vein. Proper amounts of water and sodium chloride must be taken daily, for derangement of liver and renal function makes fluid therapy particularly important. Early decompression of the obstructed biliary tract reduces the damage to the liver cells, and for this reason a two stage operation is often desirable for the sicker patients with neoplastic obstruction to the common duct. In such cases drainage of the gallbladder with local anesthesia after two to four days of preparation may be followed by a safer anastomosis of the gallbladder to the gastrointestinal tract two weeks later.

CONCLUSIONS

1. Prothrombin deficiency in obstructive jaundice depends on such factors as duration and degree of biliary obstruction, infection, avitaminosis K and malnutrition.

2. Response to administration of vitamin K-cholic acid mixture is immediate except with rapidly progressing liver damage.

3. Massive pathologic bleeding may occur with prothrombin values below 40 per cent.

4. Hyperprothrombinemia during vitamin K-cholic acid therapy was not observed during this study.

5. Important also in treating prothrombin deficiency in obstructive jaundice are administration of dextrose and proper fluids and early decompression of the biliary tract.

ABSTRACT OF DISCUSSION

DR. H. P. SMITH, Iowa City: As the authors have stated, patients are definitely in danger of bleeding when the plasma prothrombin level is less than 40 per cent of normal. I think they will agree that vitamin K should be given even when the prothrombin level is as high as 70 per cent. One thereby prevents the patient from falling into the danger zone later on. It is of interest that some patients bleed at the 30 per cent level, whereas others do not. I find that in some cases thrombin develops in clotting blood more rapidly than in others. This is a compensation which to some extent corrects for a deficiency in the amount of prothrombin. It is of interest that in the dog this compensatory mechanism is highly developed, and dogs do not bleed until the prothrombin reaches the astonishingly low level of 10-15 per cent. In man, as the authors pointed out, bleeding commonly begins at the 40 per cent level, but this varies with the degree of compensation present. The fall in the prothrombin level with liver injury is important. This supplements animal experiments which showed a fall in plasma prothrombin when the liver is partially removed or when it is injured by chloroform or phosphorus. It is evident that the liver is a factory concerned in the manufacture of prothrombin. Vitamin K is one of the raw products used by the liver, and without vitamin K the liver cannot perform this important duty. A lowering of the plasma prothrombin level may therefore be due either to shutting off the supply of raw material (vitamin K) or to an injury to the factory—the liver. The feeding of vitamin K corrects the former but not the latter. The suggestion that the prothrombin level be used as a test of liver function is of merit. It must be remembered that the manufacture of prothrombin is merely one of the duties of the liver. It is

possible that some types of liver injury depress certain liver functions more than others, and the prothrombin test may not indicate the degree to which certain other functions are depressed. But with this qualification the test should be a valuable addition to the liver function tests already available.

DR. HUGH R. BUTT, Rochester, Minn.: I should like to compliment the authors on their presentation and to ask two questions: First, how long did they allow the concentrates of vitamin K to be mixed with cholic acids before being administered? Second, how long after the administration of vitamin K was the so-called immediate response noticed? The treatment of hemorrhage in patients with jaundice often presents a very difficult problem. For those individuals who have a very low level of prothrombin in the blood it has been the custom to administer rather large doses of concentrates of vitamin K and bile salts through a duodenal tube. In such instances it is perhaps best to mix 1 or 2 Gm. of animal bile salts in 400 or 500 cc. of warm physiologic solution of sodium chloride and add to this 1 or 2 cc. of the crude concentrates. This is mixed well and administered slowly. For some patients it is necessary to repeat this procedure one or more times in order to reduce the clotting time to near normal. The problem of treating patients who are actively bleeding is extremely difficult. Clotted blood often must be removed from the stomach and occasionally the biliary tract must be irrigated before proper absorption of the administered materials can take place. During the past two years my associates and I have encountered a group of patients who had very little jaundice and whose prothrombin levels before and after operation were normal but who nevertheless bled occasionally postoperatively. These patients have been found among the group suffering with acute, subacute and chronic cholecystitis with stones. A few of these patients have had massive hemorrhages, and bleeding in most instances has been controlled by the adequate administration of vitamin K and bile salts. This group of patients emphasizes again the importance of the normal integrity of the liver in the management of hemorrhagic diathesis of patients with jaundice. In other words, jaundice does not necessarily accompany cholemic bleeding in all patients with hepatic injury and, finally, a normal level of prothrombin at the time of operation or after operation does not guarantee against the recurrence of cholemic bleeding at a later date.

DR. L. WALLACE FRANK, Louisville, Ky.: I wish to call attention to the use of vitamin K in the treatment of hemorrhage from the upper gastrointestinal tract. It is not uncommon to see profuse bleeding from this region which is not associated with ulcers and not associated with tumors but is associated with hypertrophic gastritis and duodenitis. In a small series of cases observed since November of last year the blood prothrombin according to the Quick method was estimated at from 65 to 70 per cent of normal when the bleeding began. One of these patients has been observed over a period of five months. He has bled on two occasions and at each time the blood prothrombin was 65 per cent of normal. What initiates bleeding from the upper gastrointestinal tract in this type of case, i. e. hypertrophic duodenitis, is satisfactorily explained by Dr. H. E. Robertson, of the Mayo Clinic. He has demonstrated rather conclusively in such cases that erosion of the mucosa occurs which extends into a more or less rich vascular network in the submucosa. The amount of blood loss varies in relation to the size of the vessels. It is my belief that if the individual's blood prothrombin is high or normal the blood loss will be negligible but if the prothrombin is low the hemorrhage may become alarming. I have used vitamin K in the treatment of such hemorrhage with success.

DR. JOHN D. STEWART, Boston: I am grateful to the discussers for their authoritative comments on this subject. Dr. Butt raised two or three interesting questions. With regard to whether one can say that vitamin K stimulates the formation of prothrombin, this is a difficult question since the exact relationship between vitamin K and prothrombin is not known. It is probably wise to say that vitamin K conditions the formation of prothrombin by the liver in a manner as yet undetermined but with definite quantitative implications. Another question was How long was the mixture of vitamin K and bile salts kept before using in our study? We have used for a period of nine months the same preparation. This has been stored in an ice box at minus 35 C. and has been carefully protected

from sunlight. There has been no recognizable diminution in potency of the mixture during this nine months period, as shown by prothrombin response in patients. Concerning the matter of rapidity of response, the patient's prothrombin concentration was 9.8 per cent at the time of massive bleeding. Twelve hours later, under vitamin K therapy, the prothrombin concentration was 40 per cent. This shows how quickly the remedial effect of vitamin K occurs, provided the substance is absorbed properly from the gastrointestinal tract. An important point is the method of administering the mixture of vitamin K and bile salts. Dr. Butt stated that it may be given through a nasal tube into the duodenum. We have used this technic with satisfaction. Nevertheless there is great need for a pure and effective preparation of vitamin K which can be given parenterally, perhaps eliminating the necessity of the patient's taking bile salts. Progress in this direction is being made. With regard to the reduction in prothrombin in other conditions besides obstructive jaundice of which Dr. Frank spoke, we have encountered such reduction in cases of ulcerative colitis, chronic sepsis and peptic ulcer. We have used vitamin K in treating such cases with apparent success. Dr. Butt tells me that he has recently studied a group of cases with reduction in prothrombin dependent perhaps on a general loss of intestinal mucosal absorptive power, and in such cases there was response to oral administration of vitamin K mixture.

PRESERVATION OF STORED BLOOD WITH SULFANILAMIDE

MILAN NOVAK, PH.D., M.D.
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Blood transfusion in recent years has become an increasingly important and simplified procedure in most well organized hospitals. The establishment of blood banks and the storing of blood have facilitated the use of this valuable therapeutic agent. The usual technic employed in the United States is that of the Cook County Hospital,¹ consisting of the addition of 0.35 Gm. of chemically pure sodium citrate in physiologic solution of sodium chloride to each hundred cubic centimeters of blood. This gives an adequate amount of sodium citrate for the prevention of coagulation, and after sterility and typing tests and serologic tests for syphilis the blood is available for transfusion for about ten days or more. Standardized serologic tests for typing and for the detection of syphilis give satisfactory results when carefully done. However, sterility tests on stored blood not only are technically hazardous to carry out but also give results difficult to interpret, especially when cultures yield negative results. The importance of determining sterility is usually not seriously considered. None of the reports from different hospitals describe any systematic examination for bacterial contamination after the blood has been stored. Several such articles state that up to 50 per cent of the stored blood is contaminated with bacteria but that its use is not contraindicated. The lack of serious consideration for methods of determining sterility is evidenced in the following statement by Page, Scager and Ward:² "Fifty specimens of blood after having been stored for varying periods showed no obvious contamination as evidenced by discoloration of the blood or froth on the surface." The frequency of transfusion reactions, which ranges up to 50 per cent, depending on the index used for defining a transfusion

reaction, gives evidence that there may be other factors than those usually considered to be responsible. The utter disregard for bacteria and their by-products in relation to transfusion reactions seems unjustified in the light of knowledge as to the toxic and pyrogenic reactions which they produce within the host. The recent work of Co-Tui and his associates³ on the production of pyrogens by nonpathogenic bacteria in solutions before intravenous use with resultant adverse reactions in patients receiving such products serves again to emphasize the necessity for exercising the utmost care in the prevention of gross contamination in solutions to be administered intravenously.

As to its source, contamination is most likely to occur when the blood is drawn from the donor. Assuming that all glassware, instruments and solutions used are sterile, there still remain several sources from which the blood can become contaminated. Complete sterilization of the skin previous to phlebotomy is impossible, since there are always a few bacteria which escape the bactericidal action of any cutaneous antiseptic.⁴ The needle in its course through the skin may encounter these viable organisms, and the chance for introducing them into the bottle with the blood is high. The addition of the anticoagulant solution to the bottles at the time of drawing the blood from the donor is another possible source of bacterial contamination. Manipulation of the needle in attempts at venipuncture, especially in difficult subjects with small veins, increases the possibility for the inadvertent introduction of a chance contaminant. The likelihood of the presence of a transient asymptomatic or an unrecognized bacteremia in the donor subjects the recipient of such blood to the

TABLE 1.—*Bacterial Population in Blood Containing Sulfanilamide*

Days	Control	Sulfanilamide Concentration, Mg. per 100 Cc.				
		20	40	60	80	100
Inoculated with <i>Staphylococcus Albus</i> Isolated from Stored Blood						
0	350	330	350	290	100	300
3	404	350	320	310	140	260
6	12,800	390	210	280	108	260
9	50,000	53	100	72	93	62
15	165,000	3	15	13	7	12
30	172,000	0	0	0	0	0
Inoculated with <i>Pseudomonas Aeruginosa</i> Isolated from Stored Blood						
0	26	21	23	19	23	24
3	240	9	4	5	8	16
6	19,200	7	4	8	7	23
9	1,760,000	3	2	2	7	3
15	2,112,000	22	7	240	1	49
30	1,920,000	86,000	38,000	124,000	64,000	72,000
Inoculated with a Hemolytic Spore-Forming Rod Isolated from Stored Blood						
0	23	31	23	18	26	30
3	6,400	0	1	1	1	0
6	72,000	0	0	0	0	0
9	120,000	1	1	0	0	0
15	116,000	1	0	0	0	0
30	164,000	0	0	0	0	0

deleterious action of relatively virulent organisms, since in their new host there is likely to be an absence of the inhibitory substances present in the donor.

The reported work on the use of blood from cadavers⁵ which is stored for various periods brings up

This work was carried out with the technical assistance of Miss Zora Dragich.

From the Department of Bacteriology and Immunology and University Hospitals, University of Minnesota.

1. Fantus, Bernard: Blood Preservation, *J. A. M. A.* **109**:128-131 (July 10) 1937.

2. Page, A. P. M.; Scager, K. G., and Ward, E. M.: The Use of Placental Blood for Transfusion, *Lancet* **1**:200-202 (Jan. 28) 1939.

3. Co-Tui, F. W.; Schriff, M. H., and Ruggiers, W. F.: Production of Pyrogen in Gum Acacia by Bacteria, *Proc. Soc. Exper. Biol. & Med.* **41**:533-534 (June) 1939.

4. Novak, Milan, and Hall, Harry: A Method for Determining the Efficiency of Preoperative Skin Sterilization, *Surgery* **5**:560-566 (April) 1939.

5. Shamov, W. N.: The Transfusion of Stored Cadaver Blood, *Lancet* **2**:306-309 (Aug. 7) 1937. Yudin, S. S.: Transfusion of Stored Cadaver Blood: Practical Considerations: The First Thousand Cases, *ibid.* **361-366** (Aug. 14) 1937.

the question of sterility, since the postmortem invasion of the blood stream by bacteria is extremely rapid. In the collection of placental blood⁶ the chance for bacterial contamination is far from remote. Hence the possibilities for bacterial contamination are not denied, yet the seriousness of the use of grossly contaminated blood has not been sufficiently emphasized.

The detection of contamination in stored blood is an uncertain procedure, since the number of organisms is usually small. The culturing of 1 cc. of blood from a 500 cc. quantity, as is done as a matter of routine at the time the blood is drawn from the donor, will certainly give questionable results, since a report of sterility may mean merely that the few organisms in the original bottle were not transferred in the portion cultured. The sampling error in the accepted procedure is therefore exceptionally great. On the other hand, the periodic removal of samples for culturing purposes during the period of storage is even more hazardous, since contaminants may be introduced into the flask of blood by this procedure, and hence it cannot be recommended as a routine.

plication of the different strains of organisms involved in contaminated stored blood was sulfanilamide in 1:1,000 concentration. The purpose of the present work is to determine the least amount of the drug needed to produce bacteriostasis for the various periods during which blood is usually stored. The determination of the smallest amount necessary is important, especially when large quantities of the drug are contraindicated or when multiple transfusions are to be given.

METHOD

The procedure consisted of inoculating 10 cc. of freshly drawn citrated (0.3 per cent) human blood with twenty-four hour cultures of strains of bacteria previously isolated from contaminated stored blood. An attempt was made to introduce less than 3 bacteria per cubic millimeter of blood. Various amounts of sulfanilamide were added to produce final concentrations ranging from 2.5 to 100 mg. per hundred cubic centimeters of blood, except for a control tube which contained no sulfanilamide. After thorough mixing, 0.1 cc. quantities were removed from each sample, added

TABLE 2.—*Bacterial Population in Blood Containing Small Amounts of Sulfanilamide*

Days	Control	Sulfanilamide Concentration, Mg. per 100 Cc.							
		2.5	5	7.5	10	12.5	15	17.5	20
Inoculated with <i>Staphylococcus Albus</i>									
0.....	300	320	250	320	360	290	400	360	330
5.....	157	65	238	25	82	90	86	36	58
10.....	206,000	116,000	960	0	0	3	0	1	2
15.....	188,000	164,000	96,000	0	0	0	0	0	0
30.....	230,000	184,000	136,000	0	0	0	0	0	0
Inoculated with <i>Pseudomonas Aeruginosa</i>									
0.....	128	208	390	176	168	142	194	250	180
5.....	10,240	4	17	4	1	30	1	1	0
10.....	4,480,000	2,560	170	1	1	2	0	0	3
15.....	3,960,000	384,000	42,000	12,800	10,800	2,250	2,050	3,840	96
30.....	3,200,000	2,260,000	2,420,000	1,960,000	2,100,000	\$20,000	640,000	96,000	22,000
Inoculated with Hemolytic Spore-Forming Rod									
0.....	90	55	54	41	160	120	80	86	27
5.....	5,120	90	0	0	0	23	30	1	0
10.....	120,000	320	0	0	0	0	0	0	0
15.....	106,000	12,600	14,200	40	20	20	0	0	0
30.....	120,000	98,000	82,000	66,300	26,000	22,600	15,200	10,800	18,600

Following the finding of a considerable amount of contamination in stored blood samples, it became obvious that the problem was being neglected. About 5 per cent of blood which had been stored for ten days was found to be grossly contaminated. The organisms found most frequently were aerobic or anaerobic spore-forming rods and staphylococci, both aureus and albus species. Occasionally *Pseudomonas aeruginosa* was found, and on one occasion a beta hemolytic streptococcus was isolated. Since blood is an excellent medium for bacteria, growth of these organisms takes place in blood even at 4 to 6 C., the temperature at which blood is usually stored. Quantitative bacteriologic determinations disclosed the fact that contaminated stored blood contained as many as 2,000,000 organisms per cubic centimeter.

The possibility of using a bacteriostatic substance in doses compatible with intravenous administration was suggested by one of us⁷ in a previous paper. Of the several substances investigated, the only one which completely inhibited for as long as six weeks the multi-

to a tube of molten agar and poured on a Petri plate. This was repeated at regular intervals, during which time the samples remained in a refrigerator at 4 to 6 C. Colonies were counted after a forty-eight hour period of incubation. The results shown in the tables were obtained with the organisms most frequently isolated from contaminated stored blood.

These results indicate that for a period of fifteen days a concentration of 20 mg. or less per hundred cubic centimeters is adequate but that for a longer period even 100 mg. is not sufficient in case the contaminant is *Pseudomonas aeruginosa*. However, since this is a relatively infrequent contaminant and since blood is not often stored for such long periods, the smaller quantities of the drug would usually be sufficient. Table 2 shows results with lesser concentrations of the drug.

The data indicate that a concentration of 20 mg. per hundred cubic centimeters of sulfanilamide is adequate if blood is to be stored up to ten days or two weeks. On transfusion of 500 cc. of blood containing this proportion of sulfanilamide, the amount of the drug introduced would be about 1½ grains (0.1 Gm.), which is an extremely small dose. Since the drug is readily absorbed from the blood by the tissues and since it

6. Goodall, J. R.; Anderson, F. O.; Altman, G. T., and McPhail, F. L.: Inexhaustible Source of Blood for Transfusion and Its Preservation, Surg., Gynec. & Obst. 66: 176-178 (Feb.) 1938.

7. Novak, Milan: Use of Bacteriostatic Drugs in Preservation of Blood for Transfusion, Proc. Soc. Exper. Biol. & Med. 42: 210-211 (May) 1939.

is likewise rapidly excreted, it is doubtful that any detectable elevation of blood sulfanilamide level will result even when multiple transfusions are administered. Since there is progressive deterioration in the various elements of blood, as pointed out recently by Kolmer,⁸ and since the control of bacterial multiplication is uncertain, even with sulfanilamide added, in blood stored for longer periods, it does not seem advisable to store blood for more than ten or fifteen days.

The possibility of using sulfanilamide in the preservation of other biologic products is worthy of consideration, since the drug does not tend to precipitate proteins, as frequently happens when other preservatives are used.

SUMMARY

1. Contamination of stored blood with bacteria has not been considered seriously enough in the past.

2. Many unexplained transfusion reactions may be due to pyrogens or other bacterial by-products in contaminated blood.

3. Complete bacteriostasis of the usual bacterial contaminants in stored blood is made possible by the addition of 20 mg. per hundred cubic centimeters of sulfanilamide. Such blood will not only not support bacterial growth for ten to fifteen days but may actually become sterile in that time.

4. Sulfanilamide may prove valuable as a preservative in other biologic substances.

Clinical Notes, Suggestions and New Instruments

ACETANILID POISONING

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Acetanilid poisoning presents a clinical picture which is of importance because of the incorporation of the drug in popular, widely advertised headache remedies. Cases of poisoning were reported as far back as 1886 by Eisenhardt¹ and 1890 by Herrmann.² The number of such reports varied with the current popularity of preparations containing the drug. In the early years of the present century Stewart,³ Herrick and Irons⁴ and others cited many instances of poisoning.

Two types of poisoning from acetanilid may occur. The acute form may be seen after ingestion of a normal therapeutic dose (0.2 Gm.) if there is an idiosyncrasy, as has been reported by Lundsteen, Meulengracht and Rischel,⁵ or after ingestion of the drug in dosage ordinarily regarded as toxic. However, as much as 4 Gm. has been taken at one time with no apparent ill effect. Acute acetanilid poisoning is characterized mainly by cyanosis, chills, exanthems, abdominal distress with vomiting, diffuse neurologic disorders, coma, circulatory collapse and occasionally death from cardiac failure. In cases of chronic poisoning, in addition to any of the manifestations already mentioned, there are commonly anorexia, so-called aniline cachexia, asthenia and secondary anemia. Herrick and Irons⁴ called attention to the splenomegaly which occasionally occurs. Cases combining features of both acute and chronic poisoning are frequent.

8. Kolmer, J. A.: Preserved Citrated Blood "Banks" in Relation to Transfusion in the Treatment of Disease with Special Reference to the Immunological Aspects, *Am. J. M. Sc.* 197:442-452 (April) 1939. From the Mount Sinai Hospital.

1. Eisenhardt: *München. med. Wchnschr.* 66:851, 1886.

2. Herrmann, E.: *Deutsche. med. Ztg.* 11:865, 875, 1890.

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4. Herrick, J. B., and Irons, E. E.: Chronic Acetanilid Poisoning, *J. A. M. A.* 46:351 (Feb. 3) 1906.

5. Lundsteen, E.; Meulengracht, E., and Rischel, A.: Chronic Acetanilid Poisoning, *Acta med. Scandinav.* 96:462, 1938.

REPORT OF CASE

History.—C. A., a white man aged 46, a soda fountain attendant, had for many years had severe right frontoparietal headache suggestive of migraine; this had been markedly worse during the two months before admission to the Mount Sinai Hospital. A right intranasal antrotomy four years before admission did not relieve the headache. "Bromo Seltzer," taken on an average of five times a day, was fairly efficacious in relieving the headache prior to the two months of aggravated symptoms, during which time from fifteen to twenty standard soda fountain doses were taken every day with little if any effect (each dose contains approximately 0.24 Gm.). Four days before admission the patient complained of malaise and anorexia. The temperature was 103 F. and there was mental clouding. There were two episodes of vomiting. The temperature dropped to normal during the next three days, but the mental aberration became worse. No medication was taken during this time. On admission the patient was disoriented and stuporous.

Examination.—The patient was semicomatose, pale and thin, with a striking dusky, grayish cyanosis, especially of the lips and finger nail beds, which were violaceous. The heart sounds were of fair quality. A few crepitant rales were heard at the left base. The pulse was thready. Abdominal examination was negative and there was no adenopathy. The blood pressure was 108 systolic and 74 diastolic.

Neurologic examination revealed that the pupils were equal and reacted sluggishly to light and in accommodation. There was bilateral nystagmus. There was intention tremor with asthenia and asynergia. The deep reflexes were hyperactive, more on the right than on the left side. The right cremasteric reflex was diminished and there was a bilateral Oppenheim reflex. The Babinski sign was absent.

Laboratory Data: The hemoglobin content was 84 per cent (Sahli). The white blood cell count was 7,800. The differential count showed 77 polymorphonuclear leukocytes, of which 16 were nonsegmented cells, 14 lymphocytes, 8 monocytes and 1 eosinophil. The urine was a dark reddish brown and had a yellowish foam. A trace of bile was found, and urobilin was present in concentration of 1:60. The icteric index was 3 and the blood urea nitrogen was 14 mg. per hundred cubic centimeters. The Wassermann reaction of the blood was negative. Lumbar puncture showed clear fluid under pressure of 120 mm. of water, with no block. Reaction to the Pandy test was negative. Microscopic examination showed 3 lymphocytes. The Wassermann test on the spinal fluid and the colloidal gold test gave negative results. Spectroscopic examination of the blood failed to show the absorption band for methemoglobin or sulfhemoglobin. Although the urine remained dark for five days, bile was reported absent from the later specimens. The indophenol reaction for para-aminophenol was equivocal. X-ray examination of the chest showed no abnormality.

Course.—There was rapid improvement with administration of abundant fluids. The psyche was completely clear after a week of hospitalization. The abnormal neurologic signs disappeared, although the tremor of the hands persisted. The handwriting, which was a scrawl shortly after admission, became legible. A second white blood cell count was 18,000 with 80 per cent polymorphonuclear leukocytes and 20 per cent lymphocytes; hemoglobin was 90 per cent (Sahli) and the red blood cell count was 5,000,000. The temperature, which was 100.6 F. on admission, became normal on the third day and remained so until discharge ten days later. The headaches were immediately and entirely relieved by withdrawal of the drug. However, they recurred, but only infrequently (about once a month), lasting from twelve to twenty-four hours, after the patient was discharged. They were unaffected by the intramuscular administration of ergotamine tartrate but have been relieved by acetylsalicylic acid (0.6 Gm.).

COMMENT

Cyanosis, the most frequent presenting sign in acetanilid poisoning, may be present in varying degrees. It is not due to oxygen unsaturation but to the presence of the dark colored

oxidation products of para-aminophenol,⁶ and perhaps to the presence of methemoglobin or sulfhemoglobin.

Tolerance to the drug is built up after continued use. For occasional use, for headache or lassitude, acetanilid is a powerful analgesic preparation of great value. However, if it is abused there is actually a tendency toward production of headache with the resulting establishment of a vicious circle. Presumably this was true in the case described, since withdrawal of the drug resulted in practically complete disappearance of the headache. If the drug is stopped abruptly after a long period of use there may be withdrawal symptoms of variable severity.

The treatment of acetanilid poisoning is not difficult unless symptoms of withdrawal are marked. Ordinarily, forcing of fluids by all available routes is sufficient. If the patient suffers from lack of the drug, withdrawal symptoms can be alleviated by the administration of small doses. Smith⁷ found that the addition of sodium bicarbonate to acetanilid in a molecular ratio of 1:2 reduces the mortality of experimental rats, so this drug might be used to therapeutic advantage. Collapse should be treated as is collapse from any other cause. Symptomatic treatment adds to the patient's comfort. Most of the symptoms disappear after elimination of the drug, although neurologic manifestations occasionally persist.

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SPOOL COTTON AS A SUTURE MATERIAL

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Whereas there has been a noticeable trend toward the use of nonabsorbable suture materials, particularly silk, in the past five years, undoubtedly the average physician fears nonabsorbable sutures because pathologists and some of the older surgeons have emphasized that "foreign bodies" are detrimental to tissues. This fear has deterred him from using nonabsorbable suture materials and has been justified by the poor results obtained from their incorrect use.

As Guerry¹ and Gage² have used successfully fine spool cotton as ligatures for many years, it occurred to us that the same material in proper sizes might also be used throughout major operations. Susruta about 500 B. C.³ recommended

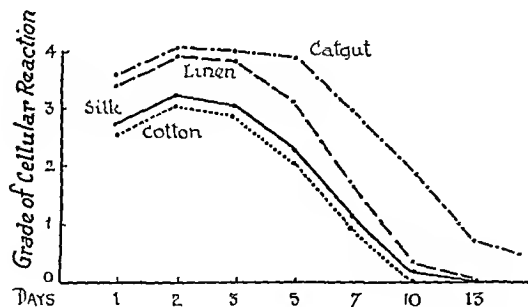


Chart 1.—Grade of cellular reaction of various suture materials.

cotton for the suture of wounds of joints and the abdomen and recently Ginkovskiy,⁴ after considerable experimental animal work, advocated the use of cotton in surgical procedures on man.

6. Young, A. G.: Hematological Studies of Anilin Poisoning, *J. Pharmacol. & Exper. Therap.* 27: 125 (March) 1926. Young, A. G., and Wilson, J. A.: Toxicological and Hematological Studies of Acetanilid Poisoning, *ibid.* 27: 133 (March) 1926.

7. Smith, P. K.: Effects of Sodium Bicarbonate on the Antipyretic Action and Toxicity of Acetanilid, *J. Pharmacol. & Exper. Therap.* 58: 192 (Oct.) 1936.

From the Department of Surgery, Tulane University of Louisiana School of Medicine.

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2. Gage, I. M.: Personal communication to the authors.

3. Melle, G. J.: Early History of the Ligature, *South African M. J.* S: 290 (April 28) 1934.

4. Ginkovskiy, V. M.: Cotton Thread as a Suture, *Vestnik. khir.* 44: 27, 1936.

In a previous paper we⁵ showed the comparative reactions of tissue (rabbit) to catgut, silk, linen and cotton sutures (chart 1). The last produced less cellular exudation and earlier healing than any of the others. Whereas dry cotton has less tensile strength size for size than catgut, silk or linen after being placed in tissues, it showed much less decrease in tensile strength (break strength) than the others (chart 2). Halsted⁶

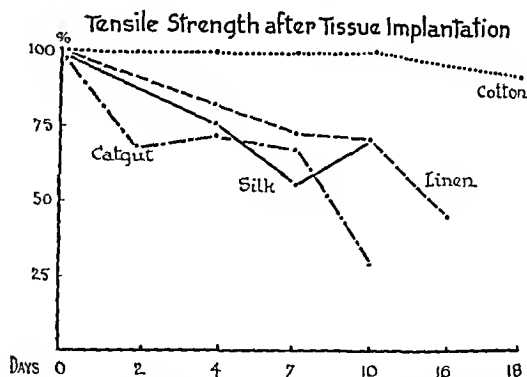


Chart 2.—Alteration in tensile strength of suture materials placed in tissues as compared with the tensile strength of the respective sutures before tissue implantation. The suture material was sterilized and then a portion of it was used for determining tensile strength. This tensile strength was taken as 100 per cent. The remaining sterile portion of the suture material was embedded in tissue for varying periods, from two days up to eighteen, at which time the tensile strength was determined and the percentage decrease in the tensile strength calculated. As shown, there was no change in the tensile strength of cotton until after the tenth day, whereas with the other materials there was a progressive decrease in tensile strength in material which had been placed in tissue.

and Howes and Harvey⁷ showed that there was no need for using a suture which had greater tensile strength than the tissue in which it was placed. Unquestionably there is a tendency for many surgeons to strangle and mutilate tissue when handling sutures of great strength.

Catgut and the materials used in its preparation for use as a suture, chromic acid salts, tannates, iodine, copper and solution of formaldehyde are all deterrents of "dry" wound healing. These chemicals, in addition to the animal protein, produce an inflammatory reaction characterized by an increased exudation which Gage² has termed "wet" type of healing, whereas cotton and silk produce little inflammatory reaction, thus resulting in a "dry" type of healing which is associated with early fibroblastic proliferation.

Ordinary and mercerized spool cotton thread is made from long fiber sea-island and Egyptian cotton. The ordinary spool cotton is made up of six twisted cords and the mercerized of three. In contrast to silk, which is a keratin-like protein, cotton is cellulose. Our investigations⁵ showed that there was practically no tissue ingrowth in cotton sutures in contrast to silk, in which each fibril is separated from the other by fibrous tissue. The lack of tissue ingrowth can be explained by the compactness of the cotton thread, which is due to the natural twist of fibril. We believe that the ingrowth of granulation tissue into the silk suture is responsible for the development of the occasional silk sinus, and for the same reason cotton will not produce sinuses because infected tissue cannot invade the suture.

A bacteriologic examination of unsterilized cotton thread showed, besides the ordinary pyogenic organisms, an anaerobic one which resembled *Bacillus histolyticus* in its cultural characteristics. *B. welchii* and related gas organisms and *B. tetani* could not be demonstrated in eighty different samples. All contaminants were killed by boiling for twenty minutes or by autoclaving for fifteen minutes at 15 pounds pressure (cultured

5. Meade, W. H., and Ochsner, Alton: Relative Value of Catgut, Silk, Linen and Cotton as Suture Materials, *Surgery*, to be published.

6. Halsted, W. S.: The Employment of Fine Silk in Preference to Catgut and the Advantages of Transfixing Tissues and Vessels in Controlling Hemorrhage, *J. A. M. A.* 60: 1119 (April 12) 1913.

7. Howes, E. L., and Harvey, I. C.: Tissue Response to Catgut Absorption, Silk and Wound Healing, Correlation with Tensile Strength, *Internat. J. Med. & Surg.* 42: 225 (April) 1930.

aerobically and anaerobically in beef broth bouillon and litmus milk for fifteen days).

When boiled for twenty minutes, cotton thread increases 10 per cent in tensile strength, whereas silk changes but little (chart 2). When placed in tissue it loses 10 per cent of its tensile strength in fourteen days, whereas catgut loses from 50 to 70 per cent and silk 35 per cent. Owing to cotton's greater coefficient of friction, a square knot holds better than it does in silk or catgut, making it possible to cut the suture closer to the knot. However, when mercerized cotton is used to coaptate tissue under tension a triple throw knot should be tied and then the suture cut on the knot.⁸

In the use of cotton as with silk, we follow strictly the tenets of Halsted,⁹ which were (1) to use interrupted sutures only, (2) never to use coarse suture material, (3) never to bridge over a dead space as a chord substitutes an arc, (4) to use transfixion sutures in ligation, as finer material could be used in this way, (5) to use a greater number of fine stitches rather than a few coarse ones and (6) to avoid the combined use of buried absorbable and nonabsorbable sutures. If these rules are disregarded trouble is likely to follow, as we have unfortunately experienced.

Spool cotton thread, plain and mercerized, has been used throughout 196 operations, among which were thyroidectomies, radical and simple mastectomies, herniorrhaphies, intestinal obstructions, perforated peptic ulcers, cholecystectomies, appendectomies, colostomies, thoracoplasties, tenorrhaphies, splenectomies, gastro-enterostomy, pneumonectomy and ligation of an external carotid artery. In the group were three serious and two minor postoperative infections. All healed without sinus formation and without extrusion or removal of a suture. One of these cases we are reporting in detail:

A Negro woman aged 50 entered Charity Hospital complaining of a large tumor on her head. Before surgical attack was made on the tumor it was decided to do a ligation of the left carotid. This was done, but considerable difficulty was experienced because of the large veins of the neck. A large lymph node was encountered and punctured with tissue forceps in its removal. The external carotid was ligated with no. 20 crochet cotton, all other vessels being ligated with transfixion ligatures of no. 50 plain cotton and the skin closed with cotton. On the fifth day the wound suppurated and by the eighth day the entire wound was open. Following irrigation with azochloramid, the granulations became clean and adhesive strapping was applied, the wound being closed entirely by the thirty-eighth postoperative day. No sutures were seen to come from or were removed from the wound. The temporal artery on that side remained occluded.

We recommend and have found satisfactory no. 60 plain cotton for the ligation of small vessels of the subcutaneous fat and other areas, no. 30 plain cotton or "heavy duty" mercerized cotton for approximation of the peritoneum and fascia. Where retention sutures are employed, no. 20 crochet cotton may be used. For through and through sutures of the abdominal wall no. 10 mercerized crochet cotton is best. Skin closure, when tension is not a factor, can be readily accomplished with no. 50 black mercerized thread. Black is used instead of white because the latter is somewhat difficult to find at times, owing to its becoming stained with blood. The cotton thread should be sterilized on a spool which does not expand in water as the cotton shrinks, causing the fibers to be broken. From a technical standpoint it is better to put all the sutures in one layer and then tie, as the tension is then transmitted to all the sutures, and besides time is saved. When there is an opportunity for serum to accumulate in the wound we have for some years used marine sponge compression bandages. We do not drain wounds unless there is gross contamination of abdominal wounds, in which a rubber tissue drain is placed down to the transversalis fascia and peritoneum. Because of its availability and the ease with which it can be sterilized, cotton thread would be a very satisfactory suture in field hospital in wartime.

S. Taylor, F. W.: *Surgical Knots and Sutures*, Surgery 5: 498 (April) 1939.

SUMMARY

1. Cotton thread has been found to be an extremely satisfactory suture, as it is easily sterilized and flexible and produces little tissue reaction and early fibroplasia.

2. Boiling for twenty minutes or autoclaving for fifteen minutes at 15 pounds pressure with the cotton wound on a rubber spool is recommended.

3. Of 196 operative procedures carried out, healing by primary intention occurred in 191.

4. There were three serious and two minor infections, all of which healed without sinus formation.

5. Halsted's rules concerning the use of silk were strictly adhered to in the use of cotton.

6. There is considerably less decrease in the tensile strength of cotton in tissue than that of catgut, silk or linen.

PLASMA PROTHROMBIN CONTENT OF BANK BLOOD

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Recently Rhoads and Panzer¹ have stated that "bank blood" is an unsatisfactory source of plasma prothrombin for the treatment of patients with the hemorrhagic tendency associated with jaundice. Their results were based on the determination of the plasma prothrombin content of bank blood by the method of Quick.²

Quick's method for the determination of plasma prothrombin controls two of the four important factors which enter into the formation of a clot. An excess of calcium and thromboplastin are added to oxalated plasma in suitable amounts, and the time taken for a clot to form is considered the prothrombin time. In the Quick test no attempt is made to control the fibrinogen in the plasma. Linton³ and Moss⁴ have demonstrated that the fibrinogen in the plasma of man and dogs is normal in the hemorrhagic tendency associated with obstructive

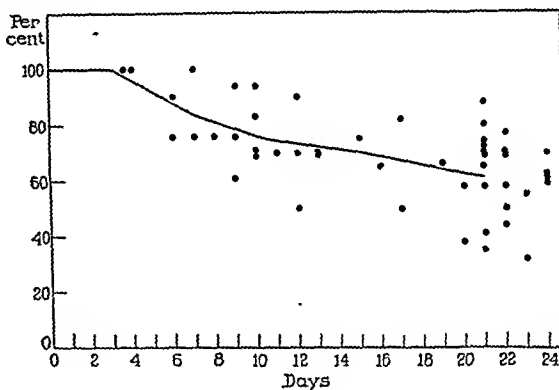


Fig. 1.—Prothrombin content of forty-nine samples of bank blood.

jaundice. On the basis of their data, Quick⁵ considered it unimportant to control the factor of fibrinogen in the clotting process.

In 1935 Warner, Brinkhous and Smith⁶ described a method for the determination of plasma prothrombin which controlled

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From the Departments of Pathology, Surgery, and Obstetrics and Gynecology of the New York Hospital and Cornell University Medical College.

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3. Linton, R. R.: The Relation of the Blood Fibrin to the Hemorrhagic Diathesis of Obstructive Jaundice, *Ann. Surg.* 96: 394-405 (Sept.) 1932.

4. Moss, Walter: Experimental Obstructive Jaundice: Its Effect on Fibrinogen and Coagulation of the Blood, *Arch. Surg.* 26: 1-19 (Jan.) 1933.

5. Quick, A. J.: The Nature of the Bleeding in Jaundice, *J. A. M. A.* 110: 1658-1662 (May 14) 1938.

6. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: A Quantitative Study on Blood Clotting: Prothrombin Fluctuations under Experimental Conditions, *Am. J. Physiol.* 114: 667-675 (Feb.) 1936.

the factor of fibrinogen as well as the calcium and thromboplastin. Their test is a titration method involving several steps which are, briefly, as follows: Oxalated plasma is rendered fibrinogen free by the addition of freshly prepared thrombin. The prothrombin which is present in the fibrinogen-free plasma is then converted to thrombin by the addition of standard amounts of calcium and thromboplastin. To this thrombin is added standard solution of fibrinogen, and the time for a clot to form is determined. The fibrinogen-free plasma is diluted sufficiently to allow a clot to form in fifteen seconds after the addition of fibrinogen. The limits of error of the titration

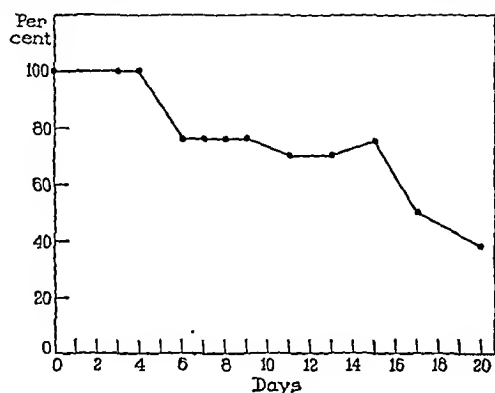


Fig. 2.—Prothrombin content of a single sample of bank blood.

method of determining plasma prothrombin in the hands of Warner, Brinkhous and Smith and of ourselves is about 15 per cent.⁷ Either sodium citrate or sodium oxalate may be used as the anticoagulant.

The present study has been divided into two parts: first, the determination of the levels of plasma prothrombin in samples of bank blood after a suitable interval of storage employing the methods of Quick² and of Warner, Brinkhous and Smith,⁸ and second, observation of the influence on plasma prothrombin of exact refrigeration as employed in the blood bank and to be described by one of us (J. B. P.). The plasma prothrombin of blood from the blood bank is contrasted with the plasma prothrombin of blood stored in the usual laboratory refrigerator. Samples for prothrombin determination were taken directly from the blood as it was being administered to the patient. The blood in the blood bank was maintained at a temperature of 2 to 4 C. The data are shown in the table. As Rhoads and Panzer¹ observed, when the method of Quick is used the plasma prothrombin falls rapidly to less than 30 per cent of normal in less than one week. In contrast, the level of plasma

Plasma Prothrombin Content of Bank Blood*

Days	Blood Bank			Typical Ice Box		
	No. of Samples	Quick Test, %	W., B. & S. Test, %	No. of Samples	Quick Test, %	W., B. & S. Test, %
1-5	2	35	100	6	93	93
6-8	5	23	84	6	79	79
9-12	11	27	75	6	48	48
13-17	6	22	69	..	..	..
18-24	25	14	61	..	..	..

* The figures indicate percentages of normal content.

prothrombin of the same samples of bank blood when tested by the method of Warner, Brinkhous and Smith shows a gradual and gentle fall, remaining above 60 per cent of normal after three weeks of storage.

The explanation of the significant difference between the levels of plasma prothrombin of blood when determined by the method of Warner, Brinkhous and Smith on the one hand and by

the method of Quick on the other is not clear. The fibrinogen content of the samples of bank blood was determined by the method of Bancroft and his co-workers,⁸ and no significant change in the average level of fibrinogen occurred during the three weeks of storage. It is possible that after storage there are qualitative changes in the fibrinogen so that it does not react with thrombin as quickly or as completely as fresh blood.

In the table, plasma prothrombin of blood from the blood bank is contrasted with plasma prothrombin of blood stored in the typical laboratory electric ice box. There is only a slight difference, i. e. 5 per cent, in the level of plasma prothrombin stored by the two methods during the first week; but by the ninth to twelfth day there is a marked loss of plasma prothrombin in the inadequately refrigerated blood, the level falling to an average of less than 50 per cent in contrast to an average of 75 per cent for the properly stored bank blood.

Figure 1 is a spot graph of the plasma prothrombin levels, as determined by the method of Warner, Brinkhous and Smith, of the forty-nine samples of rigidly stored bank blood. During the first ten days no sample has fallen to as low a level as 60 per cent of normal, and not until the twentieth day does any sample show less than 50 per cent of normal. Figure 2 shows the plasma prothrombin levels of a typical specimen of bank blood followed over a period of twenty days.

SUMMARY

1. On the basis of the method of Warner, Brinkhous and Smith, bank blood is an adequate source of plasma prothrombin for about nine days. At longer intervals of storage the plasma prothrombin declines gradually, reaching the level of 61 per cent of normal by the end of the third week of storage.

2. Carefully controlled refrigeration of bank blood is an important factor in the preservation of plasma prothrombin.

THE QUANTITY OF BLOOD REQUIRED TO PRODUCE A TARRY STOOL

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This experiment was undertaken under the direction of Dr. A. C. Ivy to ascertain the quantity of blood which, when taken by mouth, will produce a tarry stool.

Ten healthy medical students were the subjects of the experiment. The procedure employed was essentially the drinking of venous blood drawn from the subject and subsequent gross examination for a tarry stool; that is, a stool which was black and glistening. No microscopic or chemical tests for blood were used, for the results of such an examination are not obtained in a patient's history. Progressively larger quantities of blood were taken by the subject until a tarry stool occurred. Sufficient time in each case was allowed for passage of the blood through the gastrointestinal tract before larger quantities were taken. Each subject was allowed to eat a general diet of his own choice; in addition, four of the students repeated the experiment while on a diet of milk and cream, which was used to obviate any possible blackening of the stool by a general diet.

Of the ten students who took the blood while on a general diet, one had a tarry stool after taking 50 cc., two with 60 cc., three with 70 cc. and four required 75 cc. of venous blood. A tarry stool was obtained with 55, 60, 70 and 80 cc. by the four students on the milk and cream diet. In two cases this amount of blood was the same as that required on a general diet; in the other two 5 and 10 cc. more of blood was required to produce a typical tarry stool on the general than on the milk and cream diet.

CONCLUSION

At least from 50 to 80 cc. of blood when taken by mouth is required for the production of a tarry stool.

12 West Walton Place.

7. The limits of error of the Warner, Brinkhous and Smith test of about 15 per cent refers to the test as run from day to day. When several samples are run at one time, the limits of error are less than 3 per cent.

8. Bancroft, F. W.; Stanley-Brown, M., and Quick, A. J.: Post-operative Thrombosis and Embolism, *Am. J. Surg.* 28: 648-668 (June) 1935.

Special Article

THE NEW FEDERAL FOOD, DRUG AND COSMETIC ACT

A CONSIDERATION OF FEATURES THAT ARE OF
PARTICULAR INTEREST TO THE
MEDICAL PROFESSION

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The Federal Food, Drug and Cosmetic Act was enacted into law on June 25, 1938. On that date the sections pertaining to new drugs, dangerous drugs and injurious cosmetics became effective. Other provisions became operative only to the extent that they may relate to the enforcement of the aforementioned sections. The act was to have become effective in its entirety on June 25, 1939, but meanwhile an amendment was enacted postponing the new labeling requirements until Jan. 1, 1940, or later under certain conditions.

The old Food and Drugs Act was passed in 1906 when social, economic and technologic conditions in this country were vastly different from those which obtain today. During the intervening thirty-two years repeated efforts to adapt food and drug legislation to changing conditions and the growing complexity of our national life were invariably successfully opposed until the act of 1938 was passed. It is generally conceded that this law, while inadequate and defective in certain respects, is a genuine improvement over the original act. From a long range point of view, the extent to which this improvement will be translated into actual accomplishment will depend largely on three factors: (1) the manner in which the provisions of the act are interpreted by the federal courts, (2) the extent to which Congress is willing to implement its enforcement through adequate appropriations and (3) the cooperation of scientific and professional groups and consumer groups.

Certain features of the new act should be of special interest to members of the medical profession. The Food, Drug and Cosmetic Act of 1938:

1. Brings under control drugs used in the diagnosis of disease and drugs intended to affect the structure or any function of the body [sec. 201 (g) (2), (3)]. (Under the old law, only substances intended to be used for the prevention, cure or mitigation of disease were classed as drugs.)

2. Brings therapeutic devices under control and subjects them to the same general requirements as are set up for drugs [sec. 201 (h), secs. 501, 502].

3. Brings all cosmetics except soap under control [sec. 201 (i)], outlaws cosmetics which may be injurious to users, except coal tar hair dyes, which must bear warning labels and carry adequate directions for preliminary testing of the skin [sec. 601 (a)] and prohibits false or misleading labeling on cosmetics [sec. 602 (a)].

4. Prohibits traffic in drugs and devices which are dangerous to health under the conditions of use prescribed in the labeling [sec. 502 (j)]. (The old act contained no prohibition against dangerous drugs or devices.)

5. Prohibits traffic in new drugs unless such drugs have been adequately tested to show that they are safe for use under the conditions of use prescribed in their labeling, and authorizes exemption from this

requirement of drugs intended solely for investigational use by qualified scientific experts [sec. 505].

6. Requires drugs intended for use by man to bear labels warning against habit formation if they contain any of a list of narcotic or hypnotic habit-forming substances, or any derivative of any such substance which possesses the same properties [sec. 502 (d)].

7. Requires the labels of nonofficial drugs to list the names of the active ingredients and in addition to show the quantity or proportion of certain specified ingredients. Authorizes regulations prescribing exemptions from this requirement when compliance is impracticable [sec. 502 (e)].

8. Requires the labeling of drugs and devices to bear adequate directions for use but authorizes regulations exempting drugs and devices from this requirement when it is not necessary for the protection of the public health [sec. 502 (f)].

9. Exempts a drug dispensed on the written prescription of a licensed physician and the label of which contains the name and place of business of the dispenser, the serial number and date of such prescription and the name of such physician from the labeling requirements relating to:

(a) Name and address of manufacturer and statement of quantity of contents [sec. 502 (b)].

(b) Declaration of the name of the drug or the common names of the active ingredients when the drug is fabricated from two or more ingredients, and declaration of the quantity of certain specified ingredients [sec. 502 (e)].

(c) Declaration of "Warning—may be habit forming," when the drug contains the substances mentioned in section 502 (d) or their derivatives but only in those cases in which the prescription is marked as not refillable or its refilling is prohibited by other laws [sec. 502 (d)].

10. Requires the labeling of drugs and devices to bear warnings against use in those pathologic conditions or by children when its use may be dangerous to health, or against unsafe dosage or methods or duration of administration or application, in such manner and form as are necessary for the protection of users [sec. 502 (f)].

11. Requires special precautionary packaging and labeling as the Secretary of Agriculture may determine to be necessary for drugs that are liable to deterioration [sec. 502 (h)].

12. Requires labels of official drugs—i. e. drugs recognized in the United States Pharmacopeia, National Formulary or Homeopathic Pharmacopeia of the United States—to reveal any differences of strength, quality or purity from the official standards [sec. 501 (b)]. (The old law requires merely that the label bear a true statement of the strength, quality and purity of the drug without showing the difference from the official standard.)

13. Makes the Homeopathic Pharmacopeia of the United States the legal standard for homeopathic drugs [sec. 201 (j), sec. 501 (b)].

14. Requires official drugs to be packaged and labeled as prescribed by the pharmacopeias and National Formulary [sec. 502 (g)].

15. Declares nonofficial drugs illegal if the standard of strength thereof differs from, or the purity or quality falls below, the standard claimed [sec. 501 (c)]. (The old law prohibits only those which fall below the strength claimed.)

16. Requires that antiseptics possess germicidal power [sec. 201 (o)].

17. Does not contain the fraud joker in the old law under which the government must prove that false claims of curative effect on the labels of "patent medicines" were made with wilful intent to deceive.

18. Proscribes the use of containers for food, drugs and cosmetics which may render the contents injurious to health [sec. 402 (a) (6), sec. 501 (a) (3), sec. 601 (d)].

19. Prohibits traffic in food, drugs and cosmetics which have been prepared or handled under insanitary conditions that may contaminate them with filth or cause them to contain any putrid or decomposed substance or that may render them injurious to health [sec. 402 (a) (4), sec. 501 (a) (2), sec. 601 (c)].

20. Forbids the use of uncertified coal tar colors in foods; also in drugs when used for coloring purposes only, and in cosmetics other than hair dyes [sec. 402 (c), sec. 501 (a) (4), sec. 601 (e)].

21. Proscribes slack filling of containers for food, drugs and cosmetics and prohibits the use of deceptive containers [sec. 403 (d), sec. 502 (i) (1), sec. 602 (d)].

22. Prohibits traffic in food which may be injurious to health [sec. 402 (a) (1)]. (The old law prohibited injurious food only when the poisonous substance was added.)

23. Prohibits the addition of poison to food except when such addition is required in the production thereof or cannot be avoided by good manufacturing practice; when added poisons are so required or cannot be avoided, tolerances are authorized, the amount being limited to a point insuring protection of public health [sec. 402 (a) (2), sec. 406 (a)].

24. Authorizes emergency permit control of food that may be injurious because of contamination with micro-organisms if public health cannot otherwise be protected [sec. 404]. Through the operation of this provision the continued distribution of such food, or food suspected of contamination, can be stopped until the situation is fully corrected.

25. Forbids traffic in confectionery containing metallic trinkets or which bears or contains any alcohol or nonnutritive article or substance except harmless coloring, harmless flavoring, harmless resinous glaze not in excess of 0.4 per cent, natural gum, and pectin [sec. 402 (d)].

26. Specifically requires label declaration of artificial coloring, artificial flavoring and chemical preservatives in food but exempts butter, cheese and ice cream from this requirement as far as artificial coloring is concerned [sec. 403 (k)].

27. Requires labeling of special dietary food to inform purchasers fully of its vitamin, mineral and other dietary properties [sec. 403 (j)].

28. Provides for the promulgation of a definition and standard of identity and a reasonable standard of quality and fill of container for each food but exempts from this provision fresh and dried fruits and vegetables, except avocados, cantaloupes, citrus fruits and melons [sec. 401, sec. 403 (g), (h)]. Butter is also exempt from this provision, but the act preserves the statutory definition and standard of identity for butter which became law in 1923 [sec. 902 (a)]. (The old law contains no authority for the establishment of definitions and standards of identity, and the authority to establish standards of quality and fill of container is limited to canned foods.)

29. Requires the labeling of food for which no definition and standard of identity has been fixed to disclose the ingredients by name, except spices, colorings and

flavorings, which may be declared simply as spices, colorings and flavorings. Authorizes regulations prescribing exemptions from this requirement when compliance is impracticable or results in deception or unfair competition [sec. 403 (i)].

30. Does not contain the "distinctive name" joker of the old law under which any mixture or compound of food not injurious to health could escape control.

31. Provides increased criminal penalties for violations [sec. 303].

32. Authorizes the federal courts to restrain violations by injunction [sec. 302].

EFFECT ON PRACTICE OF MEDICINE

How the new act will affect the practice of medicine is a question that has been asked by many physicians. While it is impossible to forecast to what extent the new act will ultimately aid the physician in his function of preventing and treating disease, one of the fundamental purposes of the law is to safeguard the public health. It may be pertinent to mention a few of the ways in which the act is directed toward this end:

The sections proscribing dangerous drugs and devices and injurious cosmetics and effecting more stringent control over deleterious ingredients in foods should bring about a lower general incidence of poisoning from these sources. It may be anticipated that the provisions which require disclosure of the active ingredients of drugs, adequate directions for use and warnings will aid the public in making more intelligent purchase and use of drugs. Similarly, the physician will be in a position to know the nature of the medication taken by his patients. Of particular importance is the protection provided by the act against the marketing of new drugs which have not been adequately tested for safety. The enhanced safeguards against variations in the strength, quality and purity of drugs should be of particular interest to those who administer them. Likewise, the requirement that the labels of foods offered for special dietary use bear adequate information to inform the purchaser fully as to its value, for such use will enable physicians more accurately to evaluate and advise their patients concerning such foods.

Enforcement of the Food, Drug and Cosmetic Act was entrusted to the Food and Drug Administration of the Department of Agriculture. It is to be particularly noted that this act does not include within its scope jurisdiction over advertising. In a separate bill, the so-called Wheeler-Lea Act, passed March 21, 1938, Congress specifically delegated the regulation of advertising of foods, drugs, devices and cosmetics to the Federal Trade Commission. Meats and meat food products are exempt from the provisions of the Food, Drug and Cosmetic Act to the extent that the Federal Meat Inspection Act is applicable to these products. Likewise the application of the Virus, Serum and Toxin Act of 1902 is not affected, modified or superseded by the act under discussion.

OTHER RESULTS

With the enactment of more effective regulation of foods, drugs, devices and cosmetics, the question of how this legislation will affect the work of the Council on Pharmacy and Chemistry, the Council on Foods, the Advisory Committee on Advertising of Cosmetics and Soaps of the American Medical Association and other similar groups has been raised. It has, in fact, been thoughtlessly intimated that the work of these councils would be in the main unnecessary. In a recent address, the Secretary of the Council on Pharmacy and Chem-

istry¹ pointed out the fallacies of such a concept. In his informal discussion of the topic he pointed out the respects in which the new Food, Drug and Cosmetic Act and the rules of the Council are similar in purpose, as well as the respects in which they differ in function. The protection of the public from adulterated, misbranded and dangerous drugs, devices, cosmetics and foods is a large and never ending task. It is fitting that groups such as the American Medical Association and the American Dental Association, which have an interest in public health and welfare, should participate in this work. In this as in other functions of a democratic form of government, public welfare is served best when there is a vigorous public interest and participation in the activities of government.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
PAUL NICHOLAS LEECH, Secretary.

SOBISMINOL MASS AND SOBISMINOL SOLUTION

During 1933, Hanzlik undertook to develop a soluble bismuth preparation intended for oral as well as intramuscular administration in the treatment of syphilis. A patent^{1a} was applied for by Hanzlik in 1936, and later the three manufacturers noted herewith were licensed by the Board of Trustees of Stanford University of California, assignee of the patent. The product originally called "Sodium Bismuthate Soluble"² was submitted to the Council on Pharmacy and Chemistry in 1936 for consideration under the names "Sodobismol" (E. R. Squibb & Sons), "Sodium Bismuthate Soluble-Cutter" (Cutter Laboratories) and "Sodium Bismuthate Soluble" (Eli Lilly & Co.). Subsequently the term "Sobisminol" was decided on as a suitable nonproprietary designation by Hanzlik, the respective manufacturers and the Council.

After preliminary consideration, Hanzlik and the respective manufacturers were informed that there was insufficient confirmatory evidence to warrant action by the Council at that time.

Shortly thereafter, Hanzlik reported to the Council on a small series of patients: Twenty-five had received oral treatment and fifty had been treated by injection. He indicated that data had been obtained on the absorption and excretion of bismuth after oral administration of sobisminol mass to several patients and that estimation of bismuth had been made on several hundred weekly specimens of urine. Subsequent material which formed the basis of later publications by Hanzlik, Lehman and Richardson² and by Sollmann, Cole and Henderson³ was also called to the attention of the Council. More recently, a number of articles have appeared in the literature furnishing evidence in confirmation and extension of the earlier work. The nature of this pharmacologic and clinical evidence is reviewed herewith.

CHEMICAL AND PHYSICAL PROPERTIES

It has been noted by both the A. M. A. Chemical Laboratory and by Hanzlik and his co-workers⁴ that sobisminol contains no free sodium

bismuthate⁵ but rather some unidentified bismuth complex. It has been stated that the bismuth of sobisminol remains in stable, anionic (electronegative) form in solution.² Hanzlik, Lehman and Richardson² discuss the preparation of two forms: a semisolid for oral administration and a solution to be used for injection and oral administration. The composition of the products to be marketed is described later.

The semisolid to be used for oral administration, termed "sobisminol mass," is a complex organic bismuth product the chemical nature of which has not been fully established. It is obtained by the interaction of 2 Gm. of sodium bismuthate, 4 Gm. of triisopropanolamine and 1 cc. of propylene glycol or similar ratio in larger amounts. Appropriate quantities of sodium bismuthate, triisopropanolamine and propylene glycol are thoroughly mixed and gradually heated to about 80 C., at which temperature an exothermic reaction occurs. When cool, the resultant mass is thoroughly mixed, tested, assayed and, if satisfactory, filled into capsules. The bismuth content of the finished product approximates 19.7 per cent. According to tests in the A. M. A. Chemical Laboratory, Sobisminol mass occurs as a red-brown to solid. The mass possesses an odor resembling and a bitter taste, with a sweetish, metallic in water and in alcohol, yielding a clear solution in either solvent. It is partially soluble in acetone, chloroform and ether. The pH of a solution of sobisminol mass, made by dissolving 1 Gm. in water sufficient to make a final volume of 10 cc., should not be above 11.9, as determined with a glass electrode.

The solution to be used for injection and oral administration termed "sobisminol solution" contains a complex organic bismuth product, the chemical nature of which has not been fully established. It is obtained by dissolving the products of the interaction of sodium bismuthate, triisopropanolamine and propylene glycol in a mixture of propylene glycol and water. Each cubic centimeter of sobisminol solution contains 0.5 cc. of propylene glycol, a part of which enters into a reaction with 0.03 Gm. of sodium bismuthate and 0.08 Gm. of triisopropanolamine, the remainder being water. Requisite quantities of sodium bismuthate, triisopropanolamine and a portion of the necessary propylene glycol are thoroughly mixed and allowed to react as in the preparation of sobisminol mass. The remainder of the propylene glycol and water sufficient to make the final volume are added when the reaction is complete. After mixing, the resultant solution is tested, assayed and filled into ampules containing 1 cc. and 2 cc., respectively, or bottles containing 50 cc. Each cubic centimeter of the final solution contains the equivalent of approximately 20 mg. of bismuth. Sobisminol solution occurs as a clear, dark brown-red mobile liquid. It possesses an odor resembling that of triisopropanolamine and a sweet, mildly metallic, taste. It is miscible with an equal volume of water or alcohol, yielding a clear solution. The specific gravity of sobisminol solution closely approximates 1.065 and the pH of the solution should not be below 11.1 or above 11.5, as determined with a glass electrode.

Sobisminol mass may be stored in a refrigerator; it remains stable at 38 C. Aqueous solutions of the drug do not precipitate serum proteins and may be boiled alone or with equal parts of serum without precipitation. Neither sobisminol mass in 10 per cent aqueous solution nor sobisminol solution is precipitated on the addition of equal volumes of solutions of 0.1 per cent hydrochloric acid or 0.5 per cent sodium bicarbonate, but both are precipitated by strong acids or alkali.²

PHARMACOLOGY

The pharmacologic effects of sobisminol mass and solution have been studied by Hanzlik and his co-workers.

ABSORPTION OF BISMUTH

Systemic absorption of sobisminol (mass or solution) in animals was demonstrated by determining toxic effects and fatalities with large doses,⁶ by the rate of disappearance of bismuth compounds from sites of injections⁷ and by their appearance in the urine after administration by all routes—intramuscular, gastric or oral.

The dissection of muscles of rats and guinea pigs receiving single and repeated therapeutic and fatal doses of sobisminol solution intramuscularly failed to reveal precipitates or depots of bismuth or its compounds in injected regions.⁸ Chemical analyses of these muscles by a method recently described (sensitive to about 0.04 mg. of bismuth per hundred cubic centimeters⁹) indicated practically complete absorption at the end of one hour. Hanzlik and his associates¹⁰ made quantitative studies of absorption of bismuth from the ligated stomachs and ligated loops of intestine of rabbits and white rats after injection of sobisminol solution. Although the number of results was not large enough to permit generalizations, approximately 50 per cent of the sobisminol solution placed into empty ligated intestine or stomach was found to be absorbed in from one to eight hours. A limit of bismuth absorption was reached at the end of from twenty to twenty-four hours, and in searching for the cause of the limit they found that there were relatively large quantities of bismuth in the intestinal or stomach wall.¹¹

Absorption of sobisminol (mass or solution) in man, as evidenced in clinical studies, appears to be rapid and sufficient to maintain antisyphilitic levels of bismuth concentration in the body.¹² Moreover, x-ray examination of gluteal regions in patients each receiving adequate antisyphilitic therapy in the form of injections of sobisminol solution failed to reveal shadows.²

DISTRIBUTION OF BISMUTH

Studies of bismuth distribution¹³ in the tissues have supplied further evidence of systemic absorption of sobisminol. Analysis of the kidneys,

5. Sodium bismuthate is such a "strong" oxidizing agent that it could not have existed in such a mixture as proposed without rapidly oxidizing the other substances present.

6. Hanzlik, Lehman and Richardson, footnotes 2 and 21.

7. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Intramuscular Injection of Sobisminol: Absorption and Distribution of Bismuth, *J. Pharmacol. & Exper. Therap.* 62:413 (April) 1938.

8. Hanzlik, Lehman and Richardson, footnotes 2 and 7.

9. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, W., Jr.: Rapid Clinical Method for the Estimation of Bismuth in Urine, *Arch. Dermat. & Syph.* 36:725 (Oct.) 1937.

10. Hanzlik and others, footnotes 2 and 11.

11. Hanzlik, P. J.; Lehman, A. J.; Richardson, A. P., and Van Winkle, W., Jr.: Administration of Sobisminol: Absorption, *Exper. Ther.* 4:1.

12. Hanzlik and others, footnotes 2, 4 and 20. Sollmann, Cole and Henderson.³

13. Sollmann, Torald, and Henderson: Bismuth Distribution in Dogs: Injection of a Single Dose of Various Bismuth Compounds, *Arch. Dermat. & Syph.* 36:708 (Oct.) 1937. foot-

blood, liver and brain¹⁴ of experimental animals receiving sobisminol solution by injection into ligated viscera and by gastric administration indicated the presence of bismuth compounds. However, only from 30 to 40 per cent of the animals showed it in the blood and muscles, and only about 15 per cent in the brain.⁸ Naturally, the greatest quantities of bismuth were present in the kidneys, since bismuth is excreted through those organs.

Sustained intramuscular medication in animals resulted in consistently higher quantities of bismuth in all tissues; however, different tissues varied greatly from animal to animal on the same therapeutic regimen. The tissues analyzed may be arranged in descending order of bismuth content as follows: kidney, liver, muscle, blood and brain.⁸ Following intensive therapeutic regimens, the bismuth content of the blood was generally of the order of 0.02 to 0.03 mg. per hundred cubic centimeters, and of the brain from a trace up to 0.05 mg. per hundred grams. The bismuth content of the liver was of the general order of about 0.03 to 0.06 mg. per hundred grams. Single doses yielded much smaller and inconstant concentrations, which were not discussed. Failure to find bismuth in the blood consistently was attributed to the time interval between injection of sobisminol solution and removal of tissues for analysis.

The ingestion of aqueous 0.1 to 0.3 per cent solutions of sobisminol mass by rabbits for periods of two to three months resulted in the appearance of bismuth always in the kidneys, livers and muscles and, in about one half of the animals, in the brains. Such oral administration of sobisminol solution was shown to produce a blood concentration of bismuth comparable to that after intramuscular injection.

The distribution of bismuth in man after treatment with sobisminol (mass or solution) is attested by antisyphilitic concentrations of bismuth in the blood¹⁴ and urine¹⁵ and by the finding of bismuth in cerebrospinal fluid.¹⁶

EXCRETION OF BISMUTH

Gastric administration of sobisminol solution to nine rabbits receiving doses equivalent to single and multiple (three to twelve) therapeutic doses resulted in prompt, definite and sustained urinary excretion of bismuth,² beginning the day following administration and reaching a peak on about the fourth day after single doses and on the tenth and twenty-eighth days after from three to twelve doses, respectively. Quantities of about 0.3 mg. of bismuth excreted daily were common. The total amounts of bismuth excreted were about as follows: 0.075 per cent of a total of 48 mg. of bismuth per kilogram, administered as a single dose; 2 per cent of a total of 64 mg. per kilogram, in three doses in one week; 0.3 per cent of a total of 576 mg. per kilogram in one month.

Hanzlik, Lehman, Richardson and Van Winkle¹¹ found that a considerable portion of the bismuth of sobisminol (mass or solution) administered orally escapes with the feces. Considerable amounts of bismuth were unaccounted for and presumably retained in the body (partly in the intestinal wall), supposedly to be excreted gradually over long periods in small quantities which could not be estimated. Fecal elimination of bismuth appeared to decrease as the urinary excretion of bismuth increased, and vice versa.

Comparable results on urinary and fecal excretion of bismuth have been reported by Stratton,¹⁷ who found, however, that fourteen daily gastric doses of sobisminol solution, each equivalent to 20 mg. of bismuth per kilogram of body weight, raised the total urinary excretion of bismuth to only about five times the amount excreted after a single dose, further demonstrating the limit of excretion.

Intramuscular injections of sobisminol solution resulted in greater urinary excretion of bismuth in both animals and human subjects than was obtained by oral administration.² In rabbits receiving single doses of 0.4 mg. of bismuth per kilogram, excretion of bismuth began promptly the next day, the peak being reached on the third day, the maximum daily excretion being about 0.15 mg. and the duration thirty-five days. The total excretion was 37 per cent of the total bismuth injected. After three such doses injected in one week, the peak occurred on the fifth day, the maximum daily amount of bismuth excreted being 0.5 mg., the duration being about twenty days and the total excretion 30 per cent of the total administered. After twelve such doses in one month, the peak was reached on the sixteenth day, the maximum daily amount being 0.6 mg., the duration fifty days and the total excretion 42 per cent of the total administered.

The excretion of bismuth after oral and intramuscular administration of sobisminol to man has been studied by several groups of investigators. Hanzlik and his co-workers¹⁸ and, more recently, Sollmann, Cole and Henderson³ have studied bismuth excretion after oral administration, while Hanzlik and his co-workers¹⁹ have studied excretion after intramuscular injection of sobisminol.

Twelve complete observations on seven different persons lead Hanzlik, Lehman, Richardson and Van Winkle⁴ to conclude that the oral administration of sobisminol mass and solution to man resulted in prompt and definite excretion of bismuth in the urine, although most of the bismuth was expelled in the feces. The daily excretion of bismuth in the urine, after oral administration of 1.2 or 1.8 Gm. of sobisminol mass, is comparable to that observed after intramuscular injection of soluble bismuth compounds and above that occurring after administration of the insoluble compounds. It was observed that the urinary excretion of bismuth was demonstrable one-half hour after oral administration. Such excretion was found to vary directly with the dose, to manifest a cumulative tendency and to outlast the period of administration. However, the total urinary bismuth was but a small portion of the total amount of sobisminol administered—about 0.3 per cent for doses of 1.2 or 1.8 Gm. Urinary excretion was usually retarded or reduced by the presence of food and varied considerably with the individual. The median daily contents of bismuth of 660 weekly specimens of urine of patients receiving sobisminol mass were found to be, roughly, a thousandth of the amount of bismuth administered daily.

Sollmann, Cole and Henderson,³ in a study of urinary excretion of bismuth during clinical oral administration of sobisminol mass to patients, found that doses of three capsules and of nine capsules daily for three weeks gave curves for urinary excretion resembling closely in course and degree those given by intramuscular injection of the water soluble and oil soluble compounds. The rise of excretion at the beginning of treatment and the decline after its discontinuance were as prompt as with preparations for intramuscular use. The level of excretion for the lower dose ranked just below that for other preparations; that for the higher dose ranked just above them, its median total excretion being about twice the median excretion obtained by other methods. The dose, however, had to be considerably higher with oral than with intramuscular administration. The total urinary bismuth excreted amounts to about 0.5 per cent of the quantity administered.

Bismuth excretion, after clinical intramuscular injection of sobisminol solution, indicates a sustained circulation of bismuth compounds through the body.²⁰ Daily urinary excretion of bismuth compounds fluctuates considerably but excretion continues for long periods, e. g. twenty days after one dose, thirty-four days after three doses and about sixty-four days after twelve doses. Total excretion of bismuth was about 35 per cent of the dosage administered. Fecal excretion of bismuth varied daily but amounted to about one ninth of that in urine. From 60 to 70 per cent of the bismuth injected as sobisminol solution remained unaccounted for, as in the case of rabbits.²¹

TOXICITY

The toxicity of sobisminol administered orally as sobisminol mass and intravenously or intramuscularly as sobisminol solution has been determined.⁹ It has been stated that, on the whole, the toxicity of sobisminol, intravenously and intramuscularly, compares favorably with that of other water soluble bismuth compounds used in the treatment of syphilis.⁹ Fatal intramuscular doses of sobisminol solution in milligrams of bismuth per kilogram of animal were 175 in white rats and 77 in rabbits. The 50 per cent mortality dose was 105 mg. of bismuth per kilogram for white rats.

Intravenous fatal doses of sobisminol solution in milligrams of bismuth per kilogram were found to be 17.5 in rats and 8.4 in rabbits.² The 50 per cent mortality dose was 14 in rats. Later it was concluded that the majority of white rats would die from intravenous injections of sobisminol solution equivalent to 8 mg. of bismuth per kilogram, and rabbits from doses equivalent to 4.2 mg. of bismuth per kilogram.²¹

Sobisminol solution was administered gastrically to 113 white rats, twenty-one rabbits, ten cats and ten dogs.⁹ The fatal gastric dose in white rats was 24 cc. of sobisminol solution, or 504 mg. of bismuth per kilogram; in rabbits 17 cc., or 357 mg. of bismuth per kilogram; in cats and dogs about 140 mg. of bismuth per kilogram. The 50 per cent mortality doses in rats and rabbits were quite similar; i. e. from 14 to 14.8 cc. of sobisminol solution, or from 294 to 310.0 mg. of bismuth per kilogram. It was stated that the number of cats and dogs used was too small and the contributory effects of central nervous depressants too uncertain for accurate determination of the fatal doses.

Hanzlik and his co-workers²² and Lehman and Dock²³ have investigated the effects of continued oral medication with sobisminol mass in animals. Dilutions of sobisminol mass corresponding to 0.2, 0.3 and 0.5 per cent and from 0.1 to 0.6 per cent were ingested by rats and rabbits, respectively. Aqueous 1 per cent solution of sobisminol mass was not taken voluntarily by rabbits.² With increase in concentration and total dosage of sobisminol mass, increased losses of body weight and reduction in food intake of rabbits was noted. These tendencies, however, were present to about the same degree in rabbits on a bismuth free mixture²⁴ of the other ingredients of sobisminol. Pathologic changes in the heart, liver and kidneys of some animals on both doses of sobisminol and bismuth free mixture were found to be negative or negligible.⁷ Hyperemia and congestion of the alimentary tract were observed in animals receiving doses of sobisminol solutions or bismuth free mixture in doses of toxic strength.² Renal changes resembling those due to mercury in fatal doses resulted from like doses of sobisminol solutions; but only transient renal changes, unaccompanied by progressive alteration, were observed after smaller doses.

A study of the toxicity of the ingredients of sobisminol, other than the bismuth compound, indicated that any contribution of these ingredients alone to the toxicity of intravenous and intramuscular injections of sobisminol in animals must be practically negligible.²⁴ It should be noted, however, that considerations of the contribution of possible oxidation products produced in the preparation of sobisminol mass and sobisminol solution to the toxicity of the drug have not been published.

The nonbismuth constituents of sobisminol, dissolved in water and water alone, formed a blank test control on the results with sobisminol in animals living under otherwise similar conditions. Solutions containing 0.8 per cent triisopropanolamine and 5 per cent propylene glycol had practically no demonstrable effects on growth, body weight and daily food consumption in rats, and the daily volume drunk approximated that of water in the controls.

It has been shown that continued voluntary drinking of 0.3 per cent sobisminol solution by growing rats does not lead to the alteration of bone growth.²⁵ Two pregnant rats, and later their offspring, were allowed to drink aqueous 0.3 per cent sobisminol intermittently. On examination, the gross and microscopic structure of the bones showed no differences from controls. Bismuth compounds were found in the bones, soft tissues and pooled urines of these animals. Such results with effective doses of sobisminol prompted the discontinuance of further experimentation in this direction.²⁶

19. Sollmann, Cole and Henderson.³ Hanzlik, Lehman and Richardson.¹⁹

20. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Excretion of Bismuth After Intramuscular Injection of Sobisminol: Experimental and Clinical Results, *J. Pharmacol. & Exper. Therap.* 62: 404 (April) 1938.

21. Hanzlik, P. J.; Lehman, A. J., and Richardson, A. P.: Sobisminol: Toxicity, Tolerance and Irritation According to Different Channels of Administration, *J. Pharmacol. & Exper. Therap.* 62: 372 (April) 1938.

22. Hanzlik and others, footnotes 2 and 24.

23. Lehman, A. J., and Dock, W.: Effects of Drinking Sobisminol on Skeletal Changes in Growing White Rats, *J. Pharmacol. & Exper. Therap.* 63: 88 (May) 1938.

24. Hanzlik, P. J., and Lehman, A. J.: Continued Voluntary Drinking of Sobisminol: General Effects, *J. Pharmacol. & Exper. Therap.* 62: 389 (April) 1938.

14. Hanzlik, Lehman and Richardson.²⁰ Meininger and Barnett.²⁵ Scholtz, McEachern and Wood.²⁶

15. Hanzlik, Lehman and Richardson, footnotes 2 and 20. Sollmann, Cole and Henderson, footnotes 3 and 30. Meininger and Barnett.²⁵ Scholtz, McEachern and Wood.²⁶

16. Hanzlik, Lehman and Richardson, footnotes 2 and 20.

17. Stratton, Ernest K.: The Absorption and Elimination of Bismuth Following Its Oral Administration to Rabbits, *Am. J. Syph., Gonorr. & Ven. Dis.* 22: 728 (Nov.) 1938.

18. Hanzlik and others, footnotes 2 and 4.

SIDE EFFECTS

Occasional incidence of slight and local edema and hyperemia were noted by Hanzlik, Lehman and Richardson²⁷ after the injection of large or toxic doses of sobisminol solution in animals but not, however, after doses of therapeutic order. Pain was not apparent.

Evidence of local irritation, indicated by vomiting, was present in cats and dogs given large doses of sobisminol solution gastrically. Tolerance was stated to be good when antiemetic drugs were used to avoid expulsion. Rodents tolerated the solution without emesis and stools showed no evidences of intestinal irritation, i. e. no diarrhea or bloody

Hanzlik, Lehman and Richardson²⁷ initially reported that, of a group of ninety-seven male and female patients receiving doses of 1 cc. of sobisminol solution intramuscularly, 61 per cent complained of transient stinging and burning for about ten minutes or less, 13 per cent of pain or soreness for one hour, and 26 per cent for from one to three days. The injection of similar doses of an aqueous solution containing about 50 per cent of propylene glycol and 8 per cent of triisopropanolamine gave rise to a similar distribution of complaints, although less acting was apparent. A decrease in the number of such complaints in a group of 260 patients was noted after reduction of the triisopropanolamine content of sobisminol to 5 per cent. Persistent soreness, swelling, abscesses, induration and similar evidences of irritation were not apparent, although some latent soreness was manifested occasionally.

With sobisminol mass, Meininger and Barnett²⁵ observed that 37 per cent of 192 patients showed some form of reaction, 65 per cent having mild gastric reactions. Patients taking the preparation during the first week noted symptoms of fullness, nausea and occasional vomiting. There were four cases of acute stomatitis, but these patients later were able to take the remedy. Occasionally patients would complain of severe burning sensations in the esophagus, particularly if they did not take liberal amounts of water with the preparation. No kidney damage was noted. Five patients were forced to stop the preparation because of severe gastrointestinal upsets and five were changed to other drugs because the preparations were not being taken.

Scholtz, McEachern and Wood²⁸ encountered difficulty from gastrointestinal intolerance in the oral treatment of ninety patients with three and later two capsules of sobisminol mass three times a day. Thirty patients experienced nausea and vomiting. There was bismuth "grip" in ten, anorexia in eleven and diarrhea in six. There were ten cases of stomatitis, which usually did not interfere, but three of these cases were so severe that it was necessary to stop the sobisminol capsules. Seven patients had a bismuth line. In this study also there was no evidence of prolonged therapy, thirty-eight received the drug for two months or more without interruption. Nine were unable to take more than four capsules a day. Five took the drug daily for more than a year without consequent symptoms. There seemed to be no tendency to cumulative toxic effects.

ANTISYPHILITIC EFFECTS

Hanzlik²⁷ found that the curative effects of injections of sobisminol solution in experimental syphilis were apparently equal to those obtained by the use of other bismuth preparations. Clearing of organisms from lesions after single doses of 10, 20 and 30 mg. per kilogram occurred in sixteen, seven and five days, respectively, and healing in thirty-five, sixteen and eleven days, respectively.

Clinical evidence of the antisiphilitic action of sobisminol mass and sobisminol solution has been reported by Hanzlik, Lehman and Richardson²⁷, Sollmann, Cole, Henderson and others,²⁸ Meininger and Barnett,²⁵ Scholtz, McEachern and Wood,²⁸ and Kay and Fricke.²⁹ The effects of sobisminol solution alone or in combination courses with arsenicals, administered by the intramuscular route, appeared to be equivalent to the effects with other bismuth products alone or with arsenicals. Oral administration of sobisminol mass resulted in the rapid clearing of lesions in secondary and tertiary syphilis. It should be noted, however, that these authors concluded that none of the patients had been followed long enough clinically for an adequate evaluation of the drug.

Sollmann, Cole and Henderson²⁸ have suggested combination courses of sobisminol solution and bismuth subsalicylate in oil as a means of obtaining an initial high concentration of bismuth in the treatment of patients with acute syphilis who are sensitive to arsenicals. Two series of three patients each, one iodobismutol with saligenin and sobisminol, respectively, were given three injections of the preparations the first week, two injections the second week, and one injection the third week. The median urinary excretion curve of the series on sobisminol was shown to have a higher urinary bismuth excretion than the series on iodobismutol with saligenin and also a more prolonged excretion after the injections had ceased. Moreover, when the two preparations were used in conjunction with intramuscular injections of bismuth subsalicylate in oil it was found that the median urinary bismuth excretion of a series of patients on sobisminol and bismuth subsalicylate in oil showed a higher and more prolonged excretion than a like series of patients on iodobismutol with saligenin and bismuth subsalicylate in oil.

Sollmann, Cole and Henderson²⁸ also administered three capsules equivalent to 420 mg. of bismuth, three times a day to three patients with primary and two with secondary syphilis. Spirochetes disappeared from lesions in a median of seven days. Moreover, excretion of bismuth after oral administration of sobisminol capsules was found to be higher than after administration of most bismuth preparations by any route.

Scholtz, McEachern and Wood²⁸ at first administered three capsules of sobisminol three times a day, later reducing the dose to two capsules three times a day, in a series of eighty cases of various types of syphilis. In cases of early syphilis, sobisminol mass was never used for more than two weeks without use of arsenicals. In five cases of seropositive primary

syphilis, dark fields were negative in a median of five days, with extremes of two and eight days. Lesions became involuted in a median of fourteen days, with extremes of ten and twenty. In twenty-seven cases of secondary syphilis the lesions of twenty-two were completely involuted in an average of twelve days, the lesions of ten patients taking two capsules three times a day were completely involuted in about thirteen days, and of twelve patients taking three capsules three times a day, in about twelve days. The small advantage of the larger dose was, however, counterbalanced by the lack of gastrointestinal symptoms when the smaller dose was used. The tertiary lesions of six patients involuted in thirty-one days, and squamous palmar lesions in thirty-three days. A large gumma of the soft palate disappeared in twenty days. These authors also believed that sobisminol would eventually prove to be of value in syphilis of the soft tissue system. One important point that is brought out is the evidence of sustained therapeutic effects from the drug when it is administered orally. If, however, treatment with sobisminol mass by mouth is stopped, the antisiphilitic effect appears to stop. In two cases of secondary syphilis, complete involution occurred in about two weeks. Because of nonattendance, the patients were not placed on arsenical treatment and it was noted that reactivation and relapse of the processes occurred within a period of two or three weeks.

Meininger and Barnett²⁵ noted that the disappearance of spirochetes in twenty-nine cases of primary syphilis usually occurred in about four days when three capsules of sobisminol mass three times a day were being taken. In four other cases they were still present at the end of fourteen days, at which time arsenical therapy was instituted. Primary syphilitic lesions involuted in an average of about ten days. Secondary lesions involuted in about the same length of time in twenty-six cases, while eleven additional cases of secondary syphilis were not entirely free at the end of fourteen days when nearsphenamine was started. The late lesions of syphilis required about 4.5 weeks of treatment with sobisminol capsules before involution occurred. Treatment with sobisminol capsules alone was continued for an average of about five months with seventy-three patients having late syphilis, more than six months with twenty-three patients, and more than twelve months with seven patients. Serologic reversal was noted in three cases: one reversed at four months, one at seven months and one was 2 plus when treatment was stopped at the end of ten months, becoming negative three months later.

Nineteen-three of their patients were treated with sobisminol mass in a form of combination course with nearsphenamine similar to that described by Beckh and Barnett³¹ for iodobismutol with saligenin. A comparison of the results obtained by this method in thirty-six patients in the primary stage of syphilis, with fifty-eight patients on nearsphenamine and iodobismutol with saligenin, indicated that sobisminol was superior in the production of serologic reversal and in the prevention of nerve involvement. Relapse was noted, however, in 12 per cent of the sobisminol-nearsphenamine group and in 11 per cent of the iodobismutol with saligenin group. Relapses were clinical in type in eight of the first group and four of the second group, serologic only in one of the first group and five of the second group. The average time of the occurrence of relapse in the first group was fourteen months and in the second group eighteen months. The authors stated that the patients in the sobisminol group were still in the potential relapse period and more were to be expected. Only seventeen of the sobisminol group had been followed longer than that if the period of observation for the sobisminol group had been longer it would compare less favorably with iodobismutol with saligenin in the prevention of relapse. They express the opinion that the occurrence of relapse in the two groups may be related to the treatment patterns that were used.

Kay and Fricke²⁹ have reported the use of sobisminol mass in five cases of late syphilis, in four of which they used a dosage of one capsule three times a day until from 300 to 1,200 capsules (from 70 to 166 Gm. of bismuth) were employed. Symptomatic and serologic improvement appeared in all four patients. Tolerance was found to be good, and, in spite of the length of the period of treatment, serious reactions were rare.

COMMENT

In view of the evidence, it would appear that sobisminol solution administered by the intramuscular route (a) exerts a definite antisiphilitic effect in experimental syphilis in the rabbit in doses of about 5 mg. per kilogram of body weight; (b) exerts a definite curative effect in experimental syphilis in the rabbit in a minimum curative dose of about 7 mg. per kilogram of body weight; (c) causes the disappearance of Spirochaeta pallida from chancres and condylomas of human beings in a period of from four to seven days; (d) acts to clear primary syphiloderms in about ten days, secondary syphilitic lesions in an average of about fourteen days, and tertiary syphilitic lesions in about thirty days; (e) acts satisfactorily in causing the reversal of the positive serologic blood reaction; (f) is moderately well tolerated after local injection; (g) produces a urinary excretion of bismuth as high as or higher than any other bismuth compound now employed in the treatment of syphilis, and (h) is followed by no greater incidence of relapse than after administration of other bismuth compounds. From the foregoing it is apparent that sobisminol solution offers a means of obtaining, by injection treatment, the systemic effects of bismuth in the treatment of syphilis.

In evaluating a bismuth compound which is to be administered orally, there are certain disadvantages which must be considered. Thus, with sobisminol mass a large number of the patients have gastrointestinal upsets, occasionally severe enough

25. Meininger, W. M., and Barnett, C. W.: The Treatment of Syphilis with Sobisminol Mass Given by Mouth, this issue, p. 2214.

26. Scholtz, J. R.; McEachern, Katherine D., and Wood, Clyde: Sobisminol Mass Clinical Results with Oral Administration, this issue, p. 2219.

27. Hanzlik, P. J.: Sodium Bismuthate Soluble in Experimental Syphilis, J. Pharmacol. & Exper. Therap. 59:328 (March) 1937.

28. Sollmann, Cole and Henderson, footnotes 3 and 30.

29. Kay, Willard E., and Fricke, John W.: Sobisminol: Its Oral Administration, California & West. Med. 50:348 (May) 1939.

30. Sollmann, Torald; Cole, Harold, and Henderson, Katherine: Combination Courses of Bismuth Administration, J. A. M. A. 111:175 (Dec.) 1938.

31. Beckh, Walter, and Barnett, C. W.: The Effect in Early Syphilis of Combined Treatment in Comparison with Alternating Treatment, Arch. Int. Med. 63:974 (May) 1939.

to cause discontinuance of the drug;³² bismuth stomatitis is seen occasionally;³² a bismuth line is not rare.³⁶ There appears to be a tendency for some individuals to neglect their treatment as soon as they begin to feel better. Some of the patients examined by Meininger and Barnett²⁵ were found to have no bismuth in the urine, but it is believed that they were patients who had neglected the treatment. When injections are being given at stated intervals, the patient arranges for this treatment, knows when he is due for it and usually appears. On the other hand, if he is simply given some capsules to take, he may forget to take them or he may leave them at home and in that way be negligent in their use. Moreover, because of gastrointestinal intolerance the patient may become discouraged in the early stages of his syphilis at a time when treatment is most necessary. These factors acquire greater significance when it is considered that no sustained bismuth effect is derived from the use of sobisminol capsules, judging by the rapid drop of urinary bismuth excretion as soon as the capsules are stopped.³⁰ It is not surprising, therefore, that Scholtz, McEachern and Wood²⁶ noted two cases of relapse in early syphilis within two weeks after sobisminol capsules were stopped. Meininger and Barnett²⁵ also speak of this danger.

The relapse tendency when oral bismuth as a medication is employed is unfortunate, because it is in the first stages of syphilis that the relapses are most frequently seen. If a bismuth preparation is employed which allows the antisiphilic effect to cease soon after its administration is stopped, with no bismuth depots in the body, there is more danger of relapse than when continuous bismuth injections are carried out.

Finally, there is danger of self medication from the use of sobisminol mass. In such case an individual, unaware of the true character of the syphilis, may use sobisminol mass for a time, perhaps not in the proper dose, until he feels better, and then stop further treatment. As a result, an early infectious relapse and the consequent spread of the disease to other persons might occur.

It must be noted that the administration of sobisminol mass in capsules by the oral route² (a) results in an effect comparable to sobisminol injection therapy in sterilizing syphilis in rabbits and in destroying organisms in local chancres; (b) produces rapidly, in a dose of three capsules three times a day, a high urinary bismuth excretion, comparable to that of any other bismuth compound studied thus far; (c) causes primary syphiloderms to clear in about ten days, secondary lesions in about fourteen days and tertiary lesions in about thirty days; (d) results in satisfactory action in reversing positive serologic tests, and (e) exerts a definite action in the treatment of syphilis, clearing chancres and condylomas.

There is a definite place for oral therapy with sobisminol mass in the treatment of syphilis, although probably not so much in the early stages as in the latent period or in the later stages of the disease. It should be useful in certain early cases of syphilis to provide continuity when conditions necessitate the patient's being absent from the physician for a matter of a week or more. It is suggested, however, that intramuscular therapy is preferable in all early syphilis, if it is possible, for the purpose of maintaining continuous therapy, if for no other reason. Attention is directed to the fact that no bismuth depot is established when the product is administered solely by the oral route. From the experimental and clinical evidence described, it must be noted that the last course of bismuth therapy should be given as a series of insoluble injections, in order to establish bismuth depots for continuation of sustained bismuth effects.

The product has been before the Council on Pharmacy and Chemistry for approximately three years, during which time there was much consideration given by all concerned. The Council appreciated the cooperation of Dr. Hanzlik and his group and their decision not to permit commercial promotion of the product unless it was accepted by the Council. Three firms have submitted the product and have agreed to market it in conformance to the rules of license laid down jointly by the board of trustees and the department of pharmacology of Stanford University and with the rules of the Council.

The Council voted to include Sobisminol Solution and Sobisminol Mass in New and Nonofficial Remedies with the understanding, in the case of the latter, that all precautions will be taken against its use for self medication,³³ and also voted to accept brands of the product.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SOBISMINOL MASS.—A complex organic bismuth product the chemical nature of which has not been fully established. It is obtained by the interaction of sodium bismuthate, triisopropanolamine and propylene glycol. It contains between 19.25 and 20.25 per cent of bismuth.

Actions and Uses.—Sobisminol mass is proposed in the treatment of syphilis and is intended for use by the oral route. It is particularly indicated for those patients unable to undergo intramuscular bismuth therapy and to supplant therapy by that route for patients compelled for a time to be out of contact with their physician. Again it may be indicated in certain other types of syphilis, e. g., congenital and latent syphilis. It is to be emphasized that it is too dangerous a drug to be employed by the patient without the careful supervision and direction of his physician, and it is sold only on prescription. In the first few days of therapy the patient should be carefully supervised and later watched for evidence of gastrointestinal upsets and of bismuth intoxication.

Dosage.—Adult dosage, from two to three capsules three times a day, taken with plenty of water, at 10 a. m., 3 p. m. and 8 p. m. Each capsule represents 150 mg. of metallic bismuth. Unless contraindications arise, such therapy may be continued for from ten to twelve weeks and represents a course of bismuth therapy. For children the dosage may be cut down to one capsule three times a day, or a 75 mg. capsule three times a day for a young child.

Sobisminol mass occurs as a red-brown to chocolate-brown colored pasty mass, possessing an odor similar to triisopropanolamine and a bitter taste, with a sweetish, metallic after-taste. It is soluble in water and alcohol, partially soluble in ether and acetone. The pH of a solution made by dissolving 1 Gm. of sobisminol mass in sufficient distilled water to make a volume of 10 cc. should not be above 11.9 as determined with a glass electrode.

Dissolve 1 Gm. of sobisminol mass in 10 cc. of water and halve the solution; to one portion add 5 cc. of 0.5 per cent sodium bicarbonate solution; to the other portion add 5 cc. of 0.1 per cent hydrochloric acid; neither solution yields a precipitate within fifteen minutes.

Dissolve 2 Gm. of sobisminol mass in 100 cc. of water; boil a 5 cc. portion: the solution remains clear and unchanged. To a separate portion of 1 cc. add 10 cc. of water and 1 cc. of 5 per cent sodium iodide 1 cc. solution: the solution remains clear. To another 1 cc. portion add 1 cc. of diluted hydrochloric acid, 5 cc. of water and 5 cc. of hydrogen sulfide solution: a black precipitate forms; to another 1 cc. portion add 3 cc. solution of diluted sulfuric acid and 1 cc. of 5 per cent sodium iodide solution: a red precipitate forms. To a 20 cc. portion add 2 cc. of nitric acid, adding more nitric acid dropwise, if necessary, until the solution is clear; divide into two equal parts; retain one part as a control and add 2 cc. of silver nitrate solution to the other part: when compared with the control, not more than a trace of turbidity is apparent (chloride). To another 20 cc. portion add 2 cc. of hydrochloric acid, adding more hydrochloric acid dropwise, if necessary, until the solution is clear; divide into two equal parts, retain one part as a control and add 2 cc. of barium chloride solution to the other part: when compared with the control, not more than a trace of turbidity is apparent (sulfate).

Transfer about 5.0 Gm. of sobisminol mass, accurately weighed, to a 100 cc. volumetric flask, add water to the mark and shake the contents thoroughly. Determine the nitrogen content of an accurately measured 10 cc. portion according to the method described in Methods of Analysis of the Association of Official Agricultural Chemists, fourth edition, p. 24, articles 22 and 23. In the procedure add 0.1 Gm. of anhydrous copper sulfate and continue the digestion for a period of two and one-half hours after the solution becomes clear. The amount of nitrogen is not less than 3.60 per cent nor more than 4.40 per cent.

Dissolve about 0.6 Gm. of sobisminol mass, accurately weighed, in 100 cc. of water and rapidly add 8 cc. of concentrated nitric acid. Add

33. In this connection it may be pointed out that the licensees have made the following agreement with Stanford University:
"Neither Licensee nor his agents, in carrying out the sale and distribution of said products shall:

- Furnish to retailers or condone or encourage use by retailers of any counter advertising or counter displays of said products;
 - Advertise said products directly to the public by advertisements in magazines or newspapers of general circulation or by printed circulars distributed to the general public;
 - Condone or encourage in any way "over the counter" sales of said products to the public except through licensed pharmacists or prescriptions of licensed physicians.
- Licensees shall use its best efforts to maintain distribution of said products exclusively through licensed pharmacists on prescription of licensed physicians, and to prevent over the counter sales of said product to the public."

32. Meininger and Barnett.²⁵ Scholtz, McEachern and Wood.²⁶

two drops of methyl red solution and then add ammonia water until the solution just turns yellow; add 3 cc. of nitric acid, heat to boiling and slowly add, with cautious stirring, 50 cc. of 10 per cent diammonium phosphate solution; dilute to a volume of about 400 cc. with boiling water and allow the mixture to stand for one hour at 80 C. Collect the precipitate on a tared Gooch crucible by first filtering the supernatant liquid, then wash the precipitate through the crucible, and finally complete the transfer of the precipitate by means of cold water; dry the crucible and contents at 110 C. for one hour, suspend the crucible within another crucible and ignite gently for forty-five minutes, adjusting the flame so that the bottom of the lower crucible is heated to dull redness; cool the crucible and contents and weigh the ignited material as bismuth phosphate; use the factor 0.6875 for the conversion of bismuth phosphate to bismuth; the amount of bismuth found corresponds to not less than 19.25 per cent nor more than 20.25 per cent.

Propylene Glycol. The propylene glycol used in the preparation of sobisminol mass and sobisminol solution conforms to the New and Non-official Remedies standards for this substance, which see.

Sodium Bismuthate. The sodium bismuthate used in the preparation of sobisminol mass and sobisminol solution conforms to the following tests for identity and purity:

Sodium bismuthate occurs as a nearly odorless, yellow-brown powder containing not less than 80 per cent of NaBiO_3 .

Dissolve 1 Gm. of sodium bismuthate in a mixture of 5 cc. of hydrochloric acid and 15 cc. of water; a slightly turbid, yellow solution results. Agitate 2 Gm. of sodium bismuthate with 50 cc. of water frequently during one hour; the resultant suspension is alkaline to phenolphthalein; filter, rejecting the first few cubic centimeters; evaporate 25 cc. of the clear filtrate in a tared dish, dry the residue at 120 C. and weigh; the weight of the residue is not more than 0.003 Gm.

Boil 2.5 Gm. of sodium bismuthate and 40 cc. of water for ten minutes, cool, dilute to 50 cc. with water, mix well, filter and divide into 10 cc. portions; to one portion add 0.5 cc. of nitric acid and 1 cc. of silver nitrate solution; the turbidity should not be greater than that produced in a control containing 0.025 mg. of chloride ion (*chloride*); to another portion add 0.5 cc. of normal hydrochloric acid, filter, if necessary, and add to the clear filtrate 1 cc. of barium chloride solution; the turbidity should not be greater than that produced in a control containing 0.05 mg. of sulfate ion (*sulfate*).

Heat 0.5 Gm. of sodium bismuthate with 3 cc. of sulfuric acid until fumes of sulfur trioxide appear, then complete the test for arsenic according to the method described in the U. S. P. XI: The arsenic content should not exceed 2 parts per million.

Dissolve about 0.25 Gm. of sodium bismuthate, accurately weighed, in 8 cc. of nitric acid, dilute with 100 cc. of water and continue the assay for bismuth as directed under sobisminol mass; the amount of bismuth found corresponds to not less than 66.5 per cent nor more than 72.5 per cent.

Transfer about 0.7 Gm. of sodium bismuthate, accurately weighed, to a flask and add 25 cc. of acid ferrous sulfate solution, stopper the flask, allow it to stand one-half hour, with frequent shaking, and titrate the excess ferrous sulfate with 0.1 normal potassium permanganate solution: (The acid ferrous sulfate solution must be freshly prepared and standardized by a control titration).

Triisopropanolamine. The triisopropanolamine, $\text{N}(\text{C}_3\text{H}_7\text{OH})_3$, used in the preparation of sobisminol mass and sobisminol solution responds to the following tests for identity and purity:

Triisopropanolamine occurs as a colorless to pale yellow colored, pasty semicrystalline mass, possessing a slight characteristic odor and a bitter taste. It melts to a clear liquid at a temperature of not less than 46 C.

Triisopropanolamine is readily soluble in acetone, alcohol, ether, chloroform and water.

Dissolve 1 Gm. of triisopropanolamine in 10 cc. of water; the solution is alkaline to litmus and only very slightly turbid. Dissolve 1 Gm. of triisopropanolamine in 20 cc. of water, divide the solution into two portions; to one portion add 0.5 cc. of normal hydrochloric acid, filter, if necessary, and add to the clear filtrate 1 cc. of barium chloride solution; the other portion add 0.5 cc. of nitric acid and 1 cc. of silver nitrate solution; not more than a faint turbidity develops in five minutes (*sulfate*); to the arsenic content of triisopropanolamine is produced (*chloride*); to per million; heavy metals are absent (U. S. P. XI). Incinerate 5 Gm. of triisopropanolamine; the weight of the ash does not exceed 0.05 per cent.

Transfer about 5 Gm. of triisopropanolamine to a 100 cc. volumetric flask and assay for nitrogen as directed under sobisminol mass: the amount of nitrogen found is not less than 7.1 per cent nor more than 7.6 per cent. Dissolve about 1 Gm. of triisopropanolamine, accurately weighed, in 50 cc. of distilled water and titrate with half-normal hydrochloric acid; each cubic centimeter of which is equivalent to 0.0955 Gm. of triisopropanolamine, using methyl red as the indicator; the triisopropanolamine content should be not less than 98.5 per cent nor more than 101.5 per cent.

Sobisminol Mass-Cutter.—A brand of sobisminol mass—N. N. R.

Manufactured by Cutter Laboratories, Berkeley, Calif., by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Mass-Lilly.—A brand of sobisminol mass—N. N. R.

Manufactured by Eli Lilly and Company, Indianapolis, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Mass-Squibb.—A brand of sobisminol mass—N. N. R.

Manufactured by E. R. Squibb & Sons, New York, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Mass-Squibb.—A brand of sobisminol mass—N. N. R.

Manufactured by E. R. Squibb & Sons, New York, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Mass-Squibb Capsules: Each capsule contains 0.75 Gm. of sobisminol mass representing 150 mg. of bismuth as an organic bismuth compound obtained by the interaction of sodium bismuthate, triisopropanolamine and propylene glycol.

SOBISMINOL SOLUTION.—A solution containing a complex organic bismuth product the chemical nature of which has not been fully established. It is obtained by dissolving the products of the interaction of sodium bismuthate, triisopropanolamine and propylene glycol in a mixture of propylene glycol and water. Each cubic centimeter of the solution contains between 19.5 and 20.5 mg. of bismuth and 0.5 cc. of propylene glycol.

Actions and Uses.—Sobisminol solution is proposed in the treatment of all types of syphilis and is claimed to be free from unusual discomfort when used by the intramuscular injection route.

Dosage.—From 1 to 2 cc. intramuscularly into the muscles of the buttocks twice a week. With young children the dosage may be lowered in proportion. Generally a series of from twenty to twenty-five injections is considered a course of treatment. In cases of arsenical sensitization the bismuth injections may be continued for a much longer period.

Sobisminol solution occurs as a clear, dark brown-red colored liquid, possessing an odor similar to triisopropanolamine and a sweet, mildly metallic taste. It is miscible with an equal volume of water or alcohol. The pH of a portion of sobisminol solution is not below 11.1 nor above 11.5 as determined by means of a glass electrode. The specific gravity of sobisminol solution is not less than 1.064 nor more than 1.066 at 25 C.

Undiluted sobisminol solution responds to the tests for identity and purity stated under sobisminol mass.

Transfer 5 cc. of sobisminol solution, accurately measured, to a 500 cc. beaker and determine the bismuth content according to the method stated under sobisminol mass; the amount of bismuth found is not less than 0.0195 Gm. nor more than 0.0205 Gm. per cubic centimeter.

Transfer 5 cc. of sobisminol solution, accurately measured, to a Kjeldahl flask and determine the nitrogen content according to the method stated under sobisminol mass; the amount of nitrogen found is not less than 0.0054 Gm. nor more than 0.0060 Gm. per cubic centimeter.

The propylene glycol, sodium bismuthate and triisopropanolamine used in the preparation of sobisminol solution corresponds to the standards for these substances as indicated under sobisminol mass.

Sobisminol Solution-Cutter.—A brand of sobisminol solution—N. N. R.

Manufactured by Cutter Laboratories, Berkeley, Calif., by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Solution-Lilly.—A brand of sobisminol solution—N. N. R.

Manufactured by Eli Lilly and Company, Indianapolis, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Solution-Squibb.—A brand of sobisminol solution—N. N. R.

Manufactured by E. R. Squibb & Sons, New York, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

Sobisminol Solution-Squibb.—A brand of sobisminol solution—N. N. R.

Manufactured by E. R. Squibb & Sons, New York, by license of Stanford University under U. S. patent 2,125,561 (Aug. 2, 1938; expires 1955). No U. S. trademark.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 16, 1939

The Platform of the American Medical Association

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

ORAL BISMUTH THERAPY IN SYPHILIS

The use of alternating courses of arsenicals, administered intravenously, with intramuscular injections of bismuth compounds in the treatment of syphilis is a standard procedure with many syphilologists. With this therapy the disease is under constant attack by the respective metallic compounds. Physicians who use the injection technic may be assured that the patient has received the prescribed dose. The routine weekly schedule facilitates the observation of the effect of the medication on the disease and on the patient. Regularity of examination and treatment is important to both the patient and the physician. It affords frequent opportunity for mental and moral influence, and encouragement by the physician. It aids in the maintenance of adequate records, which are useful in statistical evaluation of various therapeutic regimens. Perhaps most important to the individual and to society, routine administration of medication provides the physician with an effective means of insuring the prolonged cooperation of the patient—an essential requirement for the successful termination or control of the disease. Any plan of treatment which lacks these advantages requires serious consideration from a public health and socio-economic point of view before it is accepted as a suitable method for the treatment of syphilis.

Now, for the first time, appears a metallic preparation which seems to be useful when administered orally for the treatment of syphilis. The fact that it is taken orally indicates that it may frequently be adapted for self administration. This form of therapy is certainly not advisable except for intelligent, cooperative patients. Forgotten doses of medication or negligent behavior on the part of the patient must inevitably lead to relapse with consequent possibilities of infection of other people. It is essential that the patient take the medication regularly, as directed by the physician, or that the physician insist on the intramuscular route for therapy for uncooperative patients.

There are, of course, certain instances in which the oral route of medication would be a valuable adjunct in syphilis therapy. It can be used with caution for those individuals whose business or profession necessitates occasional absences from the physician's supervision. It should prove useful for those rare persons who have unusual difficulty in taking intramuscular injections because of resultant pain and induration of the muscles. It is also possible that in selected cases of congenital syphilis and in some cases of cardiovascular and latent syphilis the oral route of medication would be distinctly useful.

In the course of experiments directed toward the utilization of sodium bismuthate in antisyphilitic therapy, Hanzlik, at Stanford University, evolved preparations resulting from the interaction of sodium bismuthate, tri-isopropanolamine and propylene glycol, known as sobisminol mass and sobisminol solution. These products have been before the Council on

Pharmacy and Chemistry for approximately three years, a period which was necessary for the accumulation and proper evaluation of evidence for the efficacy of the orally administered product. Elsewhere in this issue of *THE JOURNAL* appears a statement by the Council on Pharmacy and Chemistry on sobisminol mass in capsules and sobisminol solution, and the announcement of acceptance of various marketed brands of these products. The studies of Hanzlik and his co-workers, of Sollmann, Cole and Henderson, and of others have shown, by clinical observations of antisyphilitic effects of sobisminol mass when given in sufficient dosage, that there is satisfactory absorption of bismuth following sobisminol mass by the oral route. Similarly confirmatory studies by Meininger and Barnett and by Scholtz, McEachern and Wood appear in this issue (pp. 2214-2223). Attention is directed to a rapid clinical method for quantitative determination of bismuth, devised by Hanzlik and his co-workers, which has been used effectively to maintain accurate observations of the level of bismuth excreted in the urine of patients treated with bismuth preparations. Adequate references to these studies appear in the report of the Council on Sobisminol (this issue, p. 2235). While some gastrointestinal disturbances have been encountered, generally they have not been sufficiently serious to interfere with adequate treatment.

This oral remedy cannot be expected to replace completely the carefully supervised use of other established therapeutic agents. It is to be emphasized that, while an oral bismuth preparation may in some situations be substituted in whole or in part for a bismuth preparation administered intramuscularly, it could never serve as an adequate substitute for alternate courses of arsenicals and bismuth compounds.

Sobisminol mass must not be sold over the counter to the public as a cure for syphilis. If it were thus marketed, the product would be a real danger and detriment to the public health. Both Hanzlik and the manufacturers are most anxious that no such contingency shall arise. Therefore, according to agreements between the board of trustees of Stanford University and each of the three firms already licensed to manufacture the product, every legal effort is being made to prevent the sale of capsules of sobisminol mass to the public other than on or by the prescription of the physician. Self medication in acute syphilis can only lead to relapse and resultant danger to the public health.

The ultimate evaluation of the therapeutic efficacy of a new drug such as sobisminol mass necessarily requires a long time. The close cooperation of Hanzlik and other investigators, the manufacturers, the Food and Drug Administration and the Council on Pharmacy and Chemistry in careful studies designed to evaluate and control this new product properly is highly commendable.

To summarize: A new antisyphilitic agent with the special property of effective oral administration will

soon be taking its place in the alleviation of the ravages of syphilis. Physicians, pharmacists and public health authorities must take care that sobisminol mass is not supplied directly to the public. Such distribution would obviously result in inadequate treatment of unrecorded and uncontrolled cases and thus would become a serious menace both to the individual and to the public health. Lastly it is pointed out that oral administration of bismuth compounds is not intended to replace the generally accepted use of bismuth preparations intramuscularly, except where special conditions prevail.

COLLAPSE THERAPY FOR PULMONARY TUBERCULOSIS AS A PUBLIC HEALTH MEASURE

Since the late Theodore B. Sachs called attention to the menace of the wide spread of tuberculosis in Chicago, the isolation of patients with the disease in the open, or contagious, stage has come to be considered the important feature in the campaign against this disease. Isolation of patients with tuberculosis in a contagious form from children under 16 years of age was made mandatory in 1917. Despite the energetic and even rigorous enforcement of the law, the number of uncontrolled cases of tuberculosis in the community was not decreased. Hruby¹ stated that in 1931 there were 700 patients on the waiting list of the Municipal Tuberculosis Sanitarium and as many on the waiting lists of the Cook County Hospital and Oak Forest institution. There were 20,000 registered cases in Chicago but only 2,471 available beds. While the idea of isolating patients with open tuberculosis was correct, it failed in its practical application for the simple reason that there was no place for the isolated persons to go.

In 1931 the board of the Municipal Tuberculosis Sanitarium initiated a program of collapse therapy on a mass scale in an attempt to stem the sources of infection. Every suitable patient at the institution and in the field was to receive the benefits of collapse therapy. The results of the campaign have now been analyzed. Of 7,344 patients treated during the period between 1931 and 1936, 3,090 were treated by the induction and maintenance of pneumothorax for more than three months, while 3,584 patients were treated without collapse therapy. Of the 3,090 patients treated, 94.2 per cent had advanced tuberculosis, 84.4 per cent had positive sputum and 81.3 per cent had cavities. Of the total, 14.2 per cent were Negroes. In the collapse group 53.9 per cent were converted from positive sputum to negative, while in the control group the conversion amounted to 15.3 per cent. Thus, since the inception of the program, according to Hruby, 1,285 "fountains of infection" have been shut off. After the treatment 64.3 per cent are still living, as compared with 31.3 per cent in the control group. Of 1,215

1. Hruby, Allan J.: Collapse Therapy of Tuberculosis Seen from the Viewpoint of Control of the Disease in the Community, *Am. Rev. Tuberc.* 40: 255 (Sept.) 1939.

patients with positive sputum converted to negative, 227 had been negative from two to three years, 154 for from three to four years, ninety-four for from four to five years, twenty-seven for from five to six years, and twenty-five for six years and over. While the mortality rates for the Municipal Tuberculosis Sanitarium based on a study of 8,779 cases amounted to 82.96 per cent for a five year period and 91.16 per cent for the ten year period, the group in which collapse therapy was practiced showed a survival rate of 69.3 per cent at the end of five years.

Extensive collapse therapy justified itself from the point of view of protecting the community, because it converted a relatively large number of open cases, for which hospitalization facilities did not exist, from a positive to a negative sputum. To overstress the importance of the widest possible collapse program and at the same time to understress or to leave unemphasized the much greater importance of creating facilities for the immediate hospitalization of the tuberculous would be wrong. A more correct orientation toward the pneumothorax therapy would be to regard it as a problem of the individual rather than as a public health measure. Indirectly of course the public would benefit as well. In every urban community there are many persons with unrecognized open tuberculosis. Cases are diagnosed as a rule in the advanced stage of the disease, that is, after countless numbers of others have been exposed to infection. Not all the cases are suitable for collapse therapy and the latter is effective in only a certain proportion. Pneumothorax therapy cannot therefore be regarded as more than a significant aid in the wider problem of the eradication of tuberculosis. The control of this condition is largely a matter of early diagnosis and segregation. No doubt the program would have yielded still better results in Chicago if better facilities for applying the principle of segregation had been available.

Current Comment

PRURITUS OF THE ANUS AND VULVA

Medical literature contains a variety of opinions concerning the cause and treatment of pruritus of the anus and vulva. Recently the Haileys¹ stated that the majority of cases of essential, idiopathic or true pruritus of the anus and vulva are due to eczema, the causes of which are essentially the same as those causing eczema in other anatomic localities. The patient's heredity makes a suitable soil for the development of the eczema, as it does for the development of asthma, hay fever, urticaria and migraine in hypersensitive persons. Pruritus of the anus and vulva, in fact, is eczema of those regions and as such is a manifestation of hypersensitiveness in the skin. The direct causes which bring on the attacks may be chemical substances, including some drugs and dyes, clothing, including wool; rubber and some synthetic fabrics, hemorrhoids, diet, heat,

atmospheric conditions or perspiration and friction. The Georgia investigators believe that, if it were always possible to obtain a reliable history, almost every case would give a history of hypersensitiveness in the family. In their series of 105 cases, more than 60 per cent gave such a history of manifestations of hypersensitiveness. Benefit in the way of treatment was offered by the roentgen ray. They obtained clinical cures lasting from months to years in 80 per cent of their cases and improvement in an additional 15 per cent. One should insist, however, on having an accurate record of any previous roentgen treatment in order to avoid possible unfortunate sequelae.

THE ONE HUNDRED AND FIFTIETH ANNIVERSARY OF THE MEDICAL SOCIETY OF SOUTH CAROLINA

At special ceremonies December 5 the Medical Society of South Carolina celebrated its one hundred and fiftieth anniversary. The governor of South Carolina, the mayor of Charleston, the present and retiring presidents of the South Carolina Medical Association, representatives of each county medical society in the state and many others were invited. Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, and Dr. Francis R. Packard, Philadelphia, editor of the *Annals of Medical History*, gave addresses. Dr. James J. Ravenel, president of the Medical Society of South Carolina, gave a historical sketch of the society. Dr. William Weston, Columbia, S. C., presented a tablet from the South Carolina Medical Association, signifying the cordial relation that has existed between the two organizations throughout the history of the state society; especially strong ties between the two organizations have been a mutual interest in medical education and the support of the Medical College of the State of South Carolina. An additional indication of cooperation is the dedication of the current issue of the *Journal of the South Carolina Medical Association* to the Medical Society of South Carolina. This was the only medical organization in South Carolina until 1848, when this society called a convention which formed the South Carolina Medical Association. Although retaining its original name, the older society then became a constituent member of the state association. Dr. James Moultrie was elected president of the new state organization and three years later, when the American Medical Association held its annual meeting in Charleston, he was elected president of the national organization. The Medical Society of South Carolina has taken great interest in promoting public health in its own community. For years it also recorded observations on the weather and conducted a botanic garden as a scientific exhibit; a medical college was established under its auspices more than a hundred years ago. Its members have made many contributions to medicine. It has a collection of books which go back to the day of its birth, including one containing the original minutes of the organization in which new members today still sign their names. The Medical Society of South Carolina is the fourth oldest medical society in the United States, almost as old as the United States government itself.

1. Hailey, Howard, and Hailey, Hugh: Pruritus Ani et Vulvae, Arch. Dermat. & Syph. 40: 726 (Nov.) 1939.

ORGANIZATION SECTION

PROPOSED PROCEDURES OF UNITED STATES CHILDREN'S BUREAU

A meeting of the Committee on Maternal and Child Health of the State and Territorial Health Officers, together with certain representatives of the Children's Bureau advisory committees on maternal and child health, was held at the Children's Bureau, September 9.

The meeting was called to consider problems connected with the increased appropriations for 1940 for maternal and child health as authorized in the amendment to the Social Security Act approved August 10. The meeting had to do with methods rather than policies.

Following are excerpts from a report on the meeting submitted under date of November 14 by the United States Children's Bureau at the request of THE JOURNAL:

A. It is recommended that the additional federal maternal and child health funds should be used (1) to improve quality of services now under way, (2) to extend specific maternal and child health services or (3) to establish demonstrations of types of service needed to enlarge the scope of care and to provide programs of complete maternity care and care of children.

B. It is further recommended that a portion of the additional federal appropriations for fund B be set aside for providing medical, nursing and hospital care for maternity patients and children in selected areas.

C. It is recommended that the use of the new federal funds be limited to one or more of the following types of service:

I. EXPANSION OF ESTABLISHED MATERNAL AND CHILD HEALTH PROGRAMS WITH OPPORTUNITY FOR ADDITIONAL FEATURES

1. Types of Medical Services—

Personnel: (a) Full-time pediatricians or obstetricians on state or local staff to assist in administration, conduct or supervision of medical aspects of program.

(b) Full-time or part-time pediatricians or obstetricians to provide clinical case consultation or to supervise newly organized outpatient clinics in pediatrics or obstetrics.

(c) Qualified local practicing physicians on part-time or fee basis to provide medical care for maternity patients or for infants and children.

(d) Other specialists (medical or surgical) as requested by attending pediatrician or obstetrician on part-time or fee basis.

Clinical services: (a) Extension of antepartum or child health clinics or conferences.

(b) Outpatient clinics in pediatrics or obstetrics, associated with public or nonprofit hospitals, in communities without such clinic services.

(c) Hospital or home care for maternity cases or for sick children.

2. Types of Nursing Services—

(a) Maternal and child health nursing consultants or supervisors on state or local staffs to assist in administration and supervision of the obstetric and pediatric nursing aspects of the maternal and child health services.

(b) Additional qualified public health staff nurses to render generalized public health nursing services which include maternal and child health services, and bedside care of maternity patients and sick children.

(c) Bedside nursing service for maternity cases or sick children on case basis by qualified registered nurses under supervision of public health nurses.

3. Other Services—

(a) Nutritionists on state or local staff to develop nutrition service in the maternal and child health program.

(b) Medical social workers on state staffs in connection with medical care programs for maternity patients or children.

4. Postgraduate Education—

(a) In medical centers—clinical courses in pediatrics or obstetrics for general practitioners.

(b) Lectures and clinics in communities throughout the states.

(c) Postgraduate education and training in pediatrics and obstetrics for full-time medical and nursing or other maternal and child health staff of state or local health agencies.

5. Regulation and Supervision of Maternity Hospitals or Homes.

Recommendations were also made regarding special demonstrations of medical care in maternity or childhood as required by the Social Security Act. These recommendations covered "maternity care and care of newborn infants including program of medical, nursing and hospital care in selected areas, providing payment for care by qualified physicians and nurses at home or in qualified hospitals." Detailed recommendations were made for carrying out these demonstrations. Among these were recommendations that diagnostic and treatment centers were to be organized in suitable hospitals, preference to be given to public hospitals where practicable. A technical advisory committee was recommended in each state to consist of obstetricians and pediatricians, including the chairman of the committee on maternal welfare of the state medical society or other physician designated by the society; the state chairman for the American Academy of Pediatrics and a local practitioner from a small community or rural area, with such other members as the state health department may wish to appoint. All procedures must be according to minimum *Federal Standards* (italics in original), and a detailed descriptive plan for the work must be submitted by the state health department to the Children's Bureau. Extensive requirements for hospitals providing care for maternity patients and newborn infants when such care is paid for from federal maternal and child health funds are outlined. Many of these are already included in the standards of the Council on Medical Education and Hospitals of the American Medical Association and of the American College of Surgeons.

Among other provisions is one to the effect that when maternal or child health care is paid for from federal funds "consultation with specialist in obstetrics" shall be "required prior to any major obstetric operation (mid and high forceps, breech extraction, version, cesarean section, mutilating operations) and for the treatment of serious complications such as eclampsia, placenta praevia, abruptio placentae, unless serious hemorrhage will not permit time to call consultant."

Provisional standards for diagnostic and treatment centers for children in a small city were set up along lines parallel to the maternal care demonstration standards, with preference again given to public hospitals where practicable and with a technical advisory committee of similar composition except that pediatric medical interests instead of obstetric are included.

The agenda for the committee meeting included a discussion of the merit system provided in the Social Security Act, title V, parts 1 and 2 as amended Aug. 10, 1939, which says:

"Clause (3) of Section 503 (a) (and of Section 513 (a)) of such act is amended to read as follows: '(3) provide such methods of administration (including after January 1, 1940, methods relating to the establishment and maintenance of personnel standards on a merit basis, except that the Board shall exercise no authority with respect to the selection, tenure of office, and compensation of any individual employed in accordance with such methods) as are necessary for the proper and efficient operation of the plan.'"¹ Although this merit system was mentioned several times during the meeting there was no genuine discussion of it nor were the details presented to the committee. It is outlined in a circular² now issued by the United States Children's Bureau. This circular incorporates the recommendations of the advisory committees briefed in the foregoing and discussions of jurisdiction under the merit system as applied to state employees and local employees; to all intents and purpose it means that any employee in a project carried out with federal funds or with the assistance of federal funds under title V of the Social Security Act will be required to be under the merit system. Exemptions are members of state and local boards or commissions, executive heads of state agencies administering functions provided under title V of the Social Security Act, members of advisory councils, committees or similar bodies paid only for

attendance at meetings, and state and local officials serving ex officio or performing incidental duties to such plans. State civil service systems are recognized and cooperation with them is contemplated. There are provisions against discrimination because of an applicant's political or religious opinions. Limitation of political activity is required and classification plan and compensation plans are required.

Permanent employees who have acquired permanent status under a state civil service or merit system established by law do not come under the Social Security Act merit system, but those who have not acquired permanent status but have served satisfactorily may be admitted either to an open competitive examination or to a qualifying examination. Detailed rules are outlined for the recruitment and appointment of new personnel, for registers of eligibles, provisions for making provisional appointments for probationary periods, promotions, furloughs, service ratings and personnel records.

Officers and committee members of state medical societies functioning in cooperation with a state department of health or other state agency operating in conjunction with title V of the Social Security Act should seek for more detailed information relative to these projects from the state board of health. The initiation of state plans is the responsibility of the state health officer. The advisory committees provided include representation of state medical societies in order that the advice of the medical profession in the several states may be available to state health departments through officially constituted channels.

STATE EDUCATION AND STATE MEDICINE

A STATEMENT BY THE BUREAU OF MEDICAL ECONOMICS

The state maintains a system of education; why should it not maintain a system of medical care? It protects us against invasion, why not against disease? This is a frequent argument for state medicine. Analogy is proverbially a dangerous foundation for a logical premise. Although most persons are exposed to both disease and education, many persons fail to get either.

In childhood and youth every one needs much the same sort of education. Health and illnesses are as individual as human beings. In adult life there are many who wish to learn the same things, so that books, lectures, classes and the radio can be used effectively for mass treatment of their educational needs. Mass diagnosis and treatment of illness breed disaster! Fairly accurate diagnoses of ignorance and of progress through educational treatment may be made by mass examinations, although even in education there are some doubts as to the accuracy and efficiency of such mass methods.

Ignorance does not appear suddenly or in epidemic form nor does it create an emergency demand for education. The need for education varies only slightly with times and conditions. The positive benefits of education are not confined to the individual. Society realizes a direct return on its investment in the education of its members.

Health and ignorance are alike only in a few features and within those limits the state is already active in both fields. The value of that state activity depends largely on how closely it is limited to the fields for which it is fitted. Whatever can be done for the people as a whole represents activities in which the state may properly concern itself. Where individuals must be distinguished and given widely different and appropriately individualized treatment the mass action of government is seldom successful.

The state can establish quarantine to protect all the people against the invasion of disease; it can collect and tabulate vital statistics pertaining to the whole population; it can assist in health education, urge widespread general immunization and rally the forces to meet the mass attacks of epidemics. Within these and such other limits as have the same qualities and objectives the medical profession has always aided and encouraged state activity.

When individuals are to be aided in the recovery from illness, the analogy of disease with education becomes a contrast. It is seldom that two persons need exactly the same medical care. The nature and

1. Recommended Standards for the Establishment of a Merit System of Personnel Administration and for Qualifications of Certain Classes of Professional Employees in State and Local Agencies Administering Maternal and Child Health Services, Services for Crippled Children, or Child Welfare Services, Under the Social Security Act, Title V, Parts 1, 2 and 3, as amended, Special Information Circular No. 1, U. S. Children's Bureau, Washington, D. C., November 1939.

2. Recommended Standards for the Establishment and Maintenance of a Merit System of Personnel Administration and for Qualifications of Certain Classes of Professional Employees in State and Local Agencies Administering Maternal and Child Health Services, Services for Crippled Children, or Child Welfare Services Under the Social Security Act, Title V, Parts 1, 2 and 3, as amended, Special Information Circular No. 1, U. S. Department of Labor, Children's Bureau, Washington, D. C., Nov. 1, 1939.

degree of illness and the progress of recovery vary widely; moreover, diseases and sick persons cannot be standardized according to the grades as used in the educational system.

Medical service does not fit into time tables or arbitrarily prepared curriculums. It is largely a twenty-four hour service. Its value depends largely on a personal relation between two individuals—the patient and the physician. It must be given at widely varying intervals to each individual who needs and desires the service, and its value depends to a high degree on the way it is suited to each personal requirement.

The reasoning which would have medicine follow the pattern of education is further weakened by an increasing volume of evidence that standardization in education has not been wholly successful. Forcing teachers and pupils into a common mold is held to be destructive of both individual and social values. Such standardization injures those of exceptional ability and thereby deprives the nation of greatly needed intelligent, independent leadership.

The universal and well-nigh equal need for education has not, under governmental control, kept its distribution, both as to quantity and quality, from varying widely in different localities. In spite of the more uniform character of education compared with medical care, few would claim that our educational system is efficiently administered. The thousands of one room schools, of underpaid and poorly trained teachers, and the failure, shown by numerous surveys, of some whole state systems to produce any satisfactory educational results do not encourage application of the same methods to the far more complex problems of personal medical care.

Political influence and pressure groups have worked much harm to education, although it is much better suited to resist or endure such influences than medical

service. It is charged that lay supervisors, ignorant of pedagogic methods, hinder professional progress and tend to cripple the freedom of thought and investigation that is of fundamental importance in education. Such influences would be much more destructive in the medical field.

In spite of the fact that education is freely offered by the state to every one and that more than 26,000,000 pupils were in elementary and high schools in 1931-1932, there were at the same time more than 2,700,000 in private and parochial schools. In other words, 10 per cent of the population refused to accept the standardized system for which they had already paid through taxation and preferred to pay a second time for the kind of education they considered more suitable to their individual desires.

The total cost of public day schools amounted to over \$2,160,000,000 and the expenditures in universities and colleges was over \$600,000,000 more. It was impossible even with these great expenditures and the enormous extent of standardization to provide employment for those who had been accepted as teachers.

In 1936 the Works Progress Administration reported that in January of that year there were 1,218 "physicians, surgeons and dentists" and 40,132 teachers who had been declared eligible for works program employment with the WPA. The effect of the depression was a widespread reduction in educational services and failure to pay those teachers who still remained at their work.

By just so much as education does resemble medical service it seems to have suffered under state administration. Only where the contrast is greatest has it been successful. If a comparison is to be made it would seem to be rather as a warning than as an example.

OFFICIAL NOTES

THE NEW YORK SESSION

Chairman of the Local Committee on Arrangements

Dr. Charles Gordon Heyd, New York, will serve as chairman of the Local Committee on Arrangements for the New York Session, which will be held June 10-14, 1940.

Applications for Reservations to the Subcommittee on Hotels

The Subcommittee on Hotels of the Local Committee on Arrangements has furnished a list of New York hotels and rates for rooms, which can be found on advertising page 32 of this issue of *THE JOURNAL* together with an application form that may be used to secure reservations through the Subcommittee on Hotels.

The form printed in the advertising pages may be clipped and, when it has been properly filled in, should be sent at once to Dr. Peter Irving, Chairman of the Subcommittee on Hotels of the Local Committee on Arrangements, Room 1036, 233 Broadway, New York.

If those who expect to attend the annual session of the American Medical Association will send in their applications at the earliest possible time, there should be no difficulty encountered in securing satisfactory accommodations. Applicants for reservations are especially requested to include a second and a third choice in order that good accommodations may be assured if the desired reservation cannot be had at the hotel of preference. It will greatly expedite matters if requests for reservations are addressed directly to Dr. Irving.

RADIO BROADCASTS

The seventh season of broadcasting by the American Medical Association over the facilities of the National Broadcasting Company and affiliated stations is now under way with programs scheduled each Thursday at 4:30 p. m. eastern standard time (3:30 central standard time, 2:30 mountain time and 1:30 Pacific time). The program is on the Blue network of the National Broadcasting Company, the key station of which is WJZ, New York.

It is impossible to publish a list of topics in advance when programs are developed from last minute proof of pages of *THE JOURNAL*. It is possible to say that future programs under consideration involve one each dealing with progress in medicine, rabies, infantile paralysis, maternal and child health, hospitals, medical education and industrial health. These programs will be as appropriate as possible to the season at which greatest interest in these topics is manifested. The programs on hospitals, medical education and industrial health will correspond with publication dates of special issues of *THE JOURNAL* devoted to these topics. The program on medical progress will be broadcast December 28. The programs on maternal and child health will be a part of the spring series.

A special program in cooperation with the National Foundation for Infantile Paralysis, Inc., and the Committee for the Celebration of the President's Birthday is scheduled to appear as the regular program dated January 11.

Lists of radio stations which have signified their intention of broadcasting Medicine in the News, according to information received from the National Broadcasting Company, were published in *THE JOURNAL* December 2, page 2065.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Annual Registration Due January 1.—Every person practicing medicine, surgery or osteopathy in Arizona is required by law to pay annually on or before January 1, to the board of medical examiners, a renewal license fee of \$3. Any licensee who does not renew his license as required above is to be penalized \$1 for each day that he practices without a renewal license, not to exceed \$50. The board of medical examiners is to revoke the license of any licensee who fails to renew his license for three successive years.

ARKANSAS

Changes in Health Officers.—Dr. Ulys Jackson, formerly of Marshall, has been assigned as health officer of Boone County with headquarters in Harrison. Dr. James F. Hays, formerly of Augusta, health officer of Woodruff County, has been placed in charge of the health unit in Pope County with headquarters in Russellville. Dr. Alvie B. Tate, Russellville, health officer in Pope County, will go to Woodruff County. Dr. Walter W. Brown, Hardy, has been appointed health officer of Sharp County.

Annual Registration Due January 1.—Every licensee of the Arkansas Eclectic Medical Examining Board must register annually with the secretary of the board between January 1 and the last day in February and pay a fee, if a resident of Arkansas, of \$2 and, if a nonresident, of \$4. The failure of a licensee to pay the required fee by March 1 automatically suspends his right to practice while delinquent. If he fails for three successive years to pay the required fee, his license is to be canceled, and thereafter he will be reinstated only on such a showing to the board of moral character and professional qualifications as would entitle the applicant to the issuance of an original license and the payment of the same fee as is required for the issuance of an original license.

Society News.—At a meeting of the Washington County Medical Society November 7 a symposium on thyrotoxicosis was presented by Drs. Arless A. Blair, Arthur F. Hoge and William R. Brooksher, all of Fort Smith. The speakers before the Mississippi County Medical Society November 7 were Drs. Henry B. Gotten and Charles G. Andrews, both of Memphis, Tenn., on "Acute Nephritis" and "Salivary Gland Tumors" respectively. At a meeting of the Benton County Medical Society in Siloam Springs November 9 Drs. George A. Hughes, Siloam Springs, spoke on "Vaginal Hysterectomy" and Harry L. Deutsch, Stilwell, Okla., "Infectious Mononucleosis." Dr. Pat Murphey, Little Rock, addressed the Pulaski County Medical Society November 20 on "Use of Air in the Treatment of Spastic Paralysis."

CALIFORNIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in California is required by law to register annually, on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of \$2. Failure to pay the required fee within sixty days after January 1 works a revocation of a license, and thereafter a license may be reissued only after application and the payment of a \$10 penalty.

Society News.—The San Francisco County Medical Society, the Bar Association of San Francisco and the San Francisco District Dental Society held a joint dinner meeting December 7. Dr. Vernon P. Thompson, Los Angeles, discussed backache before the San Diego County Medical Society December 12. At a joint meeting of the staff of Mercy Hospital, San Diego, and the San Diego Academy of Medicine December 6 Dr. A. Graeme Mitchell, Cincinnati, discussed "Medical Caricatures."

New Building for Research at Stanford.—A new building for research has been opened at Stanford University School of Medicine, San Francisco, the gift of Mrs. Louis Stern, Palo Alto. Costing about \$97,000, the Ruth Lucie Stern Research

Laboratory is three stories high, providing more than 6,000 square feet of laboratory space, all of which is exposed to direct outside light. The second floor is occupied by research in pediatrics and the top floor by the gynecologic pathologic section, female endocrine studies and cancer research.

CONNECTICUT

Society News.—The Yale Medical Society was addressed December 13 in New Haven, among others, by Drs. John R. Paul and James D. Trask on "Familial Epidemiology in Poliomyelitis." Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address the midwinter dinner of the Connecticut State Medical Society January 25 on "American Medicine and the National Government."

Annual Registration Due During January.—Every practitioner of medicine and surgery holding a license to practice in Connecticut is required by law to register during January with the state department of health and at that time to pay a fee of \$2. Licensees who have retired from active practice or who live out of the state must register annually but need not pay a fee. A practitioner failing to register is liable to a fine of not more than \$5.

FLORIDA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Florida is required by law to register annually on or before January 1 with the secretary of the state board of health and at that time to pay a fee of \$1. A licensee failing to register annually is liable to a fine of not more than \$50.

District Meetings.—At a meeting of the Second District Medical Society in Quincy October 19 the speakers included Drs. Arthur J. Logie, Jacksonville, on "Recent Advances in Tuberculosis"; Frank M. Hewson Jr., Chattahoochee, "Modern Conception of Epilepsy," and Helen W. Bellhouse, Thomasville, Ga., "Undulant Fever in Children: Its Diagnosis and a Report on Two Cases." The third annual meeting of the South Central Medical District Society was held at Sanford November 2. Among the speakers were Drs. George R. Crisler, Winter Park, on "The Efficacy of Anterior Pituitary Growth Principle in a Diabetic"; Clyde F. Bowie, Leesburg, "Kidney Infection as a Result of Obstruction"; Don D. C. C. Robertson, Orlando, "Inguinal Hernia," and Rollin D. Thompson, Orlando, "A Résumé of the First Year's Work at the State Sanatorium."

ILLINOIS

North Central Illinois Medical Meeting.—The sixty-sixth annual meeting of the North Central Illinois Medical Society was held in Bloomington December 12. The speakers included:

Dr. Benjamin Markowitz, Bloomington, Jaundice Types.
Dr. Emil D. W. Hauser, Chicago, Problems of the Foot.
Dr. Milton G. Bohrod, Peoria, Biopsy of Lymph Nodes for Diagnosis.
Dr. Aaron Arkin, Chicago, Blood Dyscrasias.
Dr. LeRoy H. Sloan, Chicago, Neurologic Problems.
Dr. James Herbert Mitchell, Chicago, Differential Diagnosis of Cutaneous and Mucous Membrane Syphilis.
Dr. Norris J. Hecker, Chicago, Newer Advances in the Treatment of Infections of the Genito-Urinary Tract.
Dr. Edwin M. Miller, Chicago, Fractures About the Elbow.
Dr. Warren H. Cole, Chicago, Surgical Aspects of Diseases of the Pancreas.
Dr. M. Herbert Barker, Chicago, Hypertension.

Drs. Robert S. Berghoff and Donald A. Hirsch, both of Chicago, conducted a heart clinic.

Chicago

Personal.—Dr. Max Thorek, Chicago, was recently made a commander of the Order of St. Alexander of Sofia for his contributions to surgical science. The honor was conferred during the fiftieth anniversary of the founding of the University of Sofia, Bulgaria.

Millions for Research.—Northwestern University will receive \$1,500,000 and the University of Chicago \$1,000,000 under the will of the late Mrs. Clara A. Abbott, widow of Dr. Wallace C. Abbott, founder of the Abbott Laboratories in North Chicago. The money in both instances is to be used for medical, surgical or chemical research. It was announced that the Physiological Building at the University of Chicago would be renamed Abbott Memorial Building, while Northwestern plans to give the name of Abbott Hall to the eighteen story dormitory which is being erected on the Chicago campus. The bequest to the University of Chicago assures an additional grant of \$1,500,000 to the university from the

Rockefeller Foundation, which in 1938 offered the grant for research in the biologic sciences on condition that the university obtain an additional \$500,000 by 1941.

Society News.—The Chicago Society of Internal Medicine was addressed November 27 by Drs. Michael H. Streicher on "Appendicitis—Incidence of Amebiasis in a Clinical Review of 3,407 Cases"; Ralph B. Bettman and Gemma M. Lichtenstein, "Acute Cholecystitis," and Laurence E. Hines, Allen H. Hoover and Edwin Graff, "Effect of Sulfanilamide on the Fibrinolytic Activity of Hemolytic Streptococci."—A symposium on hydronephrosis was presented before the Chicago Council of Medical Women November 8 by Drs. Elizabeth Rothfus Fischer, Elizabeth Clancy, Marie Ortmyer, Lillian Eichelberger and Eleanor M. Humphreys.—The Chicago Ophthalmological Society will be addressed December 18 by Mr. Hugh Hunter, among others, on "Optical Considerations of Contact Lens Prescriptions."—The Chicago Society of Contactology of Hyperergic Inflammation.—The speakers before the Chicago Pediatric Society December 19 will be Drs. Philip L. Aries on "An X-Ray Study of the Osseous Development in the Newborn with Special Reference to Congenital Syphilis" and Ernst Gellhorn, "Clinical Implications of Recent Studies on Anoxia and Asphyxia."

LOUISIANA

Annual Renewal Due January 1.—Every practitioner of medicine and surgery holding a certificate to practice in Louisiana is required by law to have his certificate renewed annually on or before January 1 by the secretary-treasurer of the state board of medical examiners and at that time to pay a fee of \$2. The board may by unanimous vote revoke any certificate not renewed.

MASSACHUSETTS

Society News.—Among the speakers before the Massachusetts Tuberculosis League November 13 was Dr. Esmond R. Long, Philadelphia, on the uncompliant tuberculosis patient.—Dr. Howard M. Clute, Boston, addressed the Boston Gastroenterological Society November 8 on "Cancer of the Stomach."—At a meeting of the Boston Infectious Disease Society November 2 Drs. William M. Hammon spoke on "Panleukopenia of Cats: A Virus Disease"; William A. Davis, "Observations on the Role of Birds and Mosquitoes in the Spread of Equine Encephalomyelitis," and John R. Mote, "Experiments with Haemophilus Influenzae (Human) in Swine."

District Meetings.—At a meeting of the Suffolk District Medical Society in Boston November 29 Drs. William Leifer, Louis Chargin and Harold T. Hyman, New York, discussed "The Theory and Practice of Massive Dose Chemotherapy by the Intravenous Drip Method in the Treatment of Early Syphilis."—The Norfolk District Medical Society devoted its meeting in Boston November 28 to a symposium on the work of certain committees of the state medical societies with the following speakers: Drs. Robert L. DeNormandie, Boston; Michael A. Tighe, Lowell, and Charles C. Lund, Boston.—At a meeting of the Worcester District Medical Society in Grafton November 8 Dr. Charles H. Lawrence, Boston, discussed "Some Practical Uses of Endocrine Therapy" and Dr. Benjamin Cohen, North Grafton, "Comparative Effects of Phenobarbital, Dilantin Sodium and Synergistic Drug Combinations in the Treatment of Epilepsy."—John Howard Mueller, Ph.D., addressed the Middlesex South District Medical Society in Cambridge November 8 on "The Physical and Chemical Properties of Filtrable Viruses."

MINNESOTA

The Bell Lecture.—Dr. Frederick T. Lord, clinical professor of medicine emeritus, Harvard Medical School, Boston, delivered the fifth annual John W. Bell Tuberculosis Lecture before the Hennepin County Medical Society, Minneapolis, December 4. His subject was "The Clinical Aspects and Diagnosis of Pulmonary Lesions."

Annual Registration Due During January.—Every practitioner of medicine and surgery holding a license to practice in Minnesota is required by law to register annually during January with the secretary of the board of medical examiners and at that time to pay a fee of \$2. A licensee who practices without renewing his license is guilty of a misdemeanor and is liable to prosecution.

Rochester's St. Mary's Hospital Observes Anniversary.—The fiftieth anniversary of the founding of St. Mary's Hospital, Rochester, was celebrated October 27. Among the speakers were Gov. Harold E. Stassen; Dr. Donald Guthrie, Sayre, Pa.; Rev. George Philip Sheridan, D.D., Rochester, "The Hospital and Community Service"; Rev. Alphonse M. Schwitalla, S.J., St. Louis, "Principles of Good Hospital Practice"; Dr. Louis B. Wilson, Rochester, "The Pioneer Sisters," and the Most Rev. John G. Murray, D.D., archbishop of St. Paul, "The Hospital of Tomorrow." The hospital is under the care of the Sisters of Saint Francis of the Congregation of Our Lady of Lourdes. The original building was opened Sept. 30, 1889. Dr. William J. Mayo, assisted by Dr. Charles, performed the first operation, and their father administered the anesthetic. The building was three stories high with a capacity of thirty-three beds. The hospital now has a capacity of 621 beds as compared with 300 at the time it was completely rebuilt in 1922. One feature of the ceremonies held to commemorate the founding of the hospital was the breaking of ground September 30 for a new medical unit, which, when completed, will contain 445 beds and cost more than \$1,250,000.

MISSISSIPPI

New Building for Health Unit.—A new building for the Lauderdale County Health Department was recently dedicated in Meridian. Costing more than \$50,000, the unit was provided through the cooperation of the Commonwealth Fund of New York, the Mississippi State Board of Health, the city of Meridian and Lauderdale County. It will serve as a public health personnel training center. Dr. Norris C. Knight is director of the county health department.

Course in Urology.—The Southeastern branch of the American Urological Association held its sixth annual meeting at Biloxi December 8-9. With its program designed to serve as a postgraduate course for the general practitioner, the speakers included:

Dr. Roy B. Henline, New York, Prostatic Calculi.
Dr. Rubin Flocks, Iowa City, Urinary Calculi.
Dr. Charles M. McKenna, Chicago, The Correction of Some Anomalies of the Genito-Urinary Tract in Children with Special Reference to the Transplantation of the Ureter into the Large Bowel for Bladder Exstrophy.
Dr. E. Granville Crabtree, Boston, Hypertension in Relation to Kidney Disease.
Dr. Edward N. Cook, Rochester, Minn., Urinary Infections.
Col. James E. Ash, Washington, D. C., Bladder Tumors.
Dr. George R. Livermore, Memphis, Tenn., Carbuncle of the Kidney.
Dr. Edgar Burns, New Orleans, Prostatic Obstruction in Negroes.

NEBRASKA

Personal.—Dr. Charles C. Snowden, Davenport, was honored November 9 by a "Pioneer Day" sponsored by the Woman's Club of Davenport. Dr. Snowden has practiced in Davenport fifty-seven years and is still active at the age of 84. A dinner at noon was attended by more than 200 persons and a formal program in the afternoon by about 350. The Rev. A. A. Brooks, Omaha, made the principal address.—Dr. Rev. S. Pinto, Omaha, has been appointed health officer of Omaha to succeed Dr. Floyd H. Kinyoun, who resigned.

Society News.—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, addressed the Omaha-Douglas County Medical Society, Omaha, November 28 on "American Medicine and the National Government."—At a meeting of the Five County Medical Society in Wayne November 6 the speakers were Drs. William R. Hamsa, Omaha, on "Examination and Treatment of Common Back Injuries"; Payson S. Adams, Omaha, "Treatment of Urinary Infections and the Importance of Good Drainage," and Mr. M. C. Smith, Lincoln, executive secretary of the Nebraska State Medical Association, business administration of the association.

NEW JERSEY

Society News.—Dr. Terry M. Townsend, New York, addressed the Essex County Medical Society, Newark, December 14 on "Ballots, Bullets and Bacteria."—Drs. John Russell Twiss and Rupert Franklin Carter, New York, addressed the Bergen County Medical Society, Englewood, November 14 on "Diagnosis and Medical Treatment of Gallbladder Disease."—Dr. Lester J. Unger, New York, addressed the Atlantic County Medical Society, Atlantic City, November 10 on "Value of Transfused Whole Blood, Citrated Blood and Preserved Blood."

MEDICAL NEWS

NEW YORK

Annual Registration Due January 1.—Every practitioner of medicine and surgery in New York is required by law to apply annually on or before January 1 to the secretary of the board of medical examiners for a certificate of registration, on application forms furnished by him, and to pay at that time a fee of \$2. The law authorizes the secretary of the board to permit secretaries of duly incorporated medical societies to act as his representatives, to receive and transmit to him such applications and fees. Practitioners are liable to severe penalties for failing to register and for continuing in practice thereafter.

New York City

Personal.—Dr. Marion B. Sulzberger gave a series of lectures at the American Institute, November 14, 21 and 28 on "Allergy—A Fundamental Biologic Principle."—Dr. Alexander W. Kruger, deputy medical superintendent of Kings County Hospital, Brooklyn, has been named medical superintendent of Greenpoint Hospital, Brooklyn.

Third Harvey Lecture.—Karl F. Meyer, Ph.D., director of the Hooper Foundation for Medical Research and professor of bacteriology, University of California, will deliver the third Harvey Lecture of the current series at the New York Academy of Medicine December 21. His subject will be "The Host-Parasite Relationship with Particular Reference to Helicobacterium Pylori."

"Hibernation" Therapy at City Hospital.—A special chamber has been installed at City Hospital on Welfare Island to provide facilities for experiments in cryotherapy, popularly known as the "hibernation" or "frozen sleep" method of treating cancer. The room has been made possible by a donation from Mr. and Mrs. Walter C. Baker, New York. The work at City Hospital will be under the direction of a committee consisting of Drs. William Laurence Whittemore, Paul K. Sauer and James R. Lisa. Previous experimental work with this therapy has been carried on at Temple University in Philadelphia.

Directory of Tuberculosis Clinics.—The New York Tuberculosis and Health Association has published a new directory of the city's tuberculosis clinics. It lists the chief physician, social worker and supervising nurse affiliated with each clinic and quotes the hours the various clinics are at the public's disposal. The city is served by twenty-five district clinics. Nineteen are operated by the department of health, four by the department of hospitals and twenty-three conduct separate sessions for children. Pneumothorax services are available in fourteen. Thirteen consultation clinics are listed, ten operated by the health department and three by the Queensboro Tuberculosis and Health Association. The health department also has a clinic in Lower Harlem conducted as a WPA project for case finding purposes. Copies of the directory may be obtained from the association, 386 Fourth Avenue.

NORTH CAROLINA

State Society to Publish Journal.—The North Carolina Medical Society will begin publication of its own official journal in January with Dr. Wingate M. Johnson, Winston-Salem, as editor. Dr. Thomas W. M. Long, Roanoke Rapids, secretary of the state society, will be the business manager. The journal will be called *North Carolina Medical Journal*.

Society News.—Drs. Frank Wilson Jr., Raleigh, and Robert B. Rodman, Wilmington, addressed the Robeson Medical Society, Wrightsville Beach, October 19, on "Perforated Peptic Ulcer" and "The Neuroses" respectively. Dr. Coy C. Carpenter, Wake Forest, addressed the Greensboro Medical Society, Lumberton, in October on diagnosis and treatment of anemia.—Dr. James W. Tankersley, Greensboro, recently on "Splenomegaly, Its Physiology, Pathology and Treatment."—Drs. Hillis L. Seay, Huntersville, and Thomas C. Bost, Charlotte, October 17 on treatment of tuberculosis and the technique of treating hernia, respectively.—A symposium on sulfanilamide and sulfapyridine was presented before the Buncombe County Medical Society, Asheville, November 6 by Drs. John C. Young, Wilson Pendleton and John LaBruce Ward. A symposium on the common cold from the point of view of the nose and throat physician was presented by Drs. Lewis M. Griffith, Cecil L. Crump and Cecil C. Swann. All are of Asheville.

NORTH DAKOTA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1 with the secretary-treasurer of the board of medical examiners and at that time to pay a fee of \$5 if a resident of North Dakota or \$2 if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be reinstated on the payment of unpaid fees and \$0.50 each month of default.

OHIO

Personal.—Dr. Carlos Eugene Pitkin, assistant clinical professor of otolaryngology at Western Reserve University School of Medicine, Cleveland, has been promoted to clinical professor, succeeding the late Dr. William B. Chamberlin. Dr. Pitkin has been a member of the faculty for twenty-three years.

Toledo Clinic Day.—Dr. Francis D. Murphy, Milwaukee, was the guest speaker at the annual clinic day sponsored by the Academy of Medicine of Toledo and Lucas County November 17. Dr. Murphy spoke in the afternoon on "Some Phases of Jaundice and Its Significance" and "Hypertension and Nephritis." The morning was devoted to clinics at Mercy Hospital.

Society News.—Dr. William H. Weir, Cleveland, discussed "Conservatism in Certain Gynecologic Conditions" at the meeting of the Academy of Medicine of Cincinnati November 28 under the auspices of the Cincinnati Obstetrical Society.—Dr. Herman W. J. Koerber, Columbus, November 15 on "Toxemia of Pregnancy."—Dr. Frederic Schreiber, Detroit, addressed the Summit County Medical Society, Akron, December 9 on "Cerebral Anoxia and Anesthesia."—Dr. Tom Douglas Spies, Cincinnati, addressed the Academy of Medicine of Cleveland December 15 on "The Vitamin B Deficiencies."

PENNSYLVANIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Pennsylvania is required by law to register annually on or before January 1 with the board of medical education and licensure in the department of public instruction and to pay a fee of \$1 or such fee as may be fixed by the department of public instruction. A practitioner who fails to register and who continues to practice is liable to a fine of from \$10 to \$100.

Society News.—Dr. Roland S. Aronson, Philadelphia, addressed the Northampton County Medical Society, Easton, November 17 on the cancer control program in Pennsylvania.—Drs. John Eiman, Abington, and Damon B. Pfeiffer, Philadelphia, November 9 on "Broader Aspects of Arterial Diseases with Special Reference to Etiology" and "Carcinoma of Rectum and Rectosigmoid" respectively.—A symposium on pneumonia was presented before the Westmoreland County Medical Society at the Mountain View Hotel near Greensburg November 21 by Drs. Bernard J. McCloskey, Johnstown; Carl E. Ervin, Harrisburg, and James W. Strang, Pittsburgh.

Philadelphia

National Defense on the Program.—The Philadelphia County Medical Society held its second annual "National Defense Night" November 27. The speakers were: Lieut. Col. John F. Corby, Philadelphia, The New Army Medical Service; Lieut. Col. William D. Fleming, Edgewood Arsenal, Md., Medical Aspects of Chemical Warfare; Dr. Robert Olesen, U. S. Public Health Service, New York, Quarantine Too Is Streamlined; Lieut. Comdr. Herbert L. Pugh, Naval Hospital, Philadelphia, Activities of the Naval Medical Corps in Guam. A film prepared by the War Department, "Chemical Warfare Company in Combat," was shown.

Pittsburgh

Society News.—Dr. William James Gardner, Cleveland, will address the Allegheny County Medical Society, December 19 on "Development of Modern Surgery of Brain." Other speakers will be Drs. John Day Garvin on "When Does a Duodenal Ulcer Become Surgical?"; Thomas C. Wilkinson, "Treatment of Tetany with Dihydroxyacetone" and Gregg A. Dillinger, "A True Evaluation of Tonsillectomy by Electrocoagulation."

SOUTH CAROLINA

Personal.—Dr. James C. Brabham, formerly of Johnsonville, has been made health officer of Colleton County with headquarters at Walterboro, succeeding Dr. Clarence L. Gnyton, who has been placed in charge of cancer control work of the state department of health.—Dr. Charles M. Moore, St. George, former health officer of Dorchester County, has been appointed director of the new inobile syphilis clinic in Charleston County.

Society News.—Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, addressed the Columbia Medical Society recently on "The Quality of Medicine." Dr. James E. Boone, Columbia, presented a paper on "Prophylaxis of Recurrent Renal Calculi." Dr. Allen F. Voshell, Baltimore, addressed the society recently on "Of Forgotten Facts About Fractures," and Dr. James R. Allison, Columbia, on "Twenty Years' Experience in the Treatment of Skin Cancer."—Dr. Emory Hill, Richmond, Va., was the guest speaker at the annual meeting of the South Carolina Society of Ophthalmology and Otolaryngology in Columbia November 7. His subject was "Some Problems of Cataract Surgery."

SOUTH DAKOTA

Health Officers Elect.—Dr. Henry Russell Brown, Watertown, was elected president of the South Dakota Health Officers Association at its annual meeting in October. Dr. Robert S. Westaby, Madison, was made vice president and Dr. John F. D. Cook, Pierre, reelected secretary.

TENNESSEE

Society News.—Dr. William H. Sebrell Jr., Washington, D. C., of the U. S. Public Health Service addressed the Sullivan-Johnson Counties Medical Society, Bristol, November 1 on diseases of nutritional deficiency with special emphasis on pellagra.—Drs. Ernest Marcus and Charles K. Slade, Mountain Home, among others, addressed the Washington County Medical Society, Johnson City, November 2 on "Some Untoward Reactions in Arsenamine Therapy" and "Serial Pyelography" respectively.—Dr. Barney Brooks, Nashville, addressed the Nashville Academy of Medicine and Davidson County Medical Society, Nashville, December 5 on surgery of the thyroid gland.—Speakers before the Dyer, Lake and Crockett Counties Medical Society November 1 were Drs. Frank D. Linn, Memphis, on "Mastoid Disease"; Clyde V. Crowell, Memphis, on "Administration of Fluids"; and Robert L. Sanders, Memphis, "Peptic Ulcer: Diagnosis and Management."—Drs. Gilbert M. Roberts and Edward F. Buchner Jr. addressed the Chattanooga and Hamilton County Medical Society November 23 on "Chronic Nonpurulent Urethritis in Women" and "Ten Year Study of Local Maternal Mortality" respectively.

TEXAS

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Texas is required by law to register annually on or before January 1 with the state board of medical examiners and at that time to pay a fee of \$2. If a practitioner fails to renew his registration within sixty days after January 1 his license is suspended.

Tri-State Meeting.—The thirty-fourth annual meeting of the Tri-State Medical Society of Louisiana, Arkansas and Texas was held in Marshall November 8-9 under the presidency of Dr. Joseph D. Roberts Jr., Longview. Among the speakers were:

Dr. Guy A. Caldwell, New Orleans, Foot and Leg Deformities in Infants and Young Children Associated with Overweight.
Dr. Millard F. Arbutnot, St. Louis, Bronchoscopy as an Aid in the Diagnosis and Treatment of Diseases of the Pulmonary Tract.
Dr. Calvin R. Hannah, Dallas, Toxemia of Pregnancy.
Dr. George B. Fletcher, Hot Springs National Park, Ark., Underwater or Pool Treatment of Certain Abnormal Conditions of Muscles, Nerves and Joints.
Dr. Charles T. Stone, Galveston, Vitamin K and Its Clinical Application.

WEST VIRGINIA

Public Health Meeting.—Dr. William H. Riheltdaifer, Romney, was elected president of the West Virginia Public Health Association at its annual meeting in Fairmont November 6-8. Among speakers at the meeting were Drs. Karl A. Menninger, Topeka, Kan., on "Should a Democracy Be Concerned with the Mental Health of Its Citizens?"; Joseph W. Mountin, U. S. Public Health Service, "What Should a Public Health Program Include?"; and Halbert L. Dunn, chief of vital statistics division, U. S. Bureau of the Census, Washington, "Democracy in the Everyday Administration of Public Health."

GENERAL

Prize for Research in Ophthalmology.—The trustees of the Association for Research in Ophthalmology announce that a cash prize of \$100 will be awarded at the 1940 meeting for the paper which in their judgment shows most originality and exemplifies best the spirit of research in ophthalmology.—Dr. Cecil S. O'Brien, University Hospitals, Iowa City, is secretary of the association.

Hygiene Association Disapproves Sex Lecturer.—The American Social Hygiene Association requests publication of a statement that the use of the association's name in certain sex publications by one Mrs. Jardine McCree is unauthorized and heartily disapproved. The association has received reports from various parts of the country that Mrs. McCree is giving lectures and showing films on sex that are objectionable. In a booklet sold in connection with the lectures entitled "Sex Problems and Advice" the name and address of the American Social Hygiene Association is printed, giving the impression that the woman is in some way connected with the organization.

Warning Against Impostor.—An Iowa physician sends a warning against one William J. Collins, who represents himself as a physician and a war veteran. Collins recently telegraphed to an Iowa town for a physician to meet the train on which he was arriving. He then decided to stop there. He appeared to be suffering from carcinoma of the bladder with profuse hemorrhage, and was also a morphine addict. He had medical and nursing care at a hotel and asked to have bills sent to the Veterans Administration. The facility at Hines, Ill., to which the bill was sent, reported that Collins had several times incurred expenses without authority and requested to have the bills sent to that hospital. No record of his case exists there, it was stated. In addition to his expenses he borrowed \$36.20 from the physician who attended him, giving a bad check therefor. Collins said he lived at Lake Worth, Texas. The American Medical Association, however, has no record of a physician of that name licensed to practice in Lake Worth.

Special Society Elections.—Dr. Charles A. Doan, Columbus, was elected president of the Central Society for Clinical Research at its twelfth annual session in Chicago November 3-4, succeeding Dr. Walter H. Nadler, Chicago. Dr. Lawrence D. Thompson, St. Louis, secretary-treasurer of the society, was made vice president and Dr. Carl V. Moore, St. Louis, secretary-treasurer. The 1940 session will be held in Chicago November 1-2.—Dr. Harry R. Foerster, Milwaukee, was elected president of the American Academy of Dermatology and Syphilology at its annual meeting in Philadelphia November 6-8. Dr. Clark W. Finnerud, Chicago, was made vice president and Dr. Earl D. Osborne, Buffalo, reelected secretary. Next year's meeting will be in Chicago.—Dr. Thomas T. Mackie, New York, was named president-elect of the American Society of Tropical Medicine at the annual meeting in Memphis, Tenn., November 21-24; Malcolm H. Soule, LL.D., Ann Arbor, Mich., vice president, and Dr. E. Harold Himman, Wilson Dam, Ala., secretary. Dr. Louis L. Williams Jr., Washington, D. C., became president.

Changes in Status of Licensure.—The Illinois Department of Registration and Education announces the following:

The Michigan State Department of Registration in Medicine announces the following:

Dr. Charles L. Soper, Barryton, Mich., license revoked recently for unprofessional conduct.

The Pennsylvania State Board of Medical Education and Licensure has reported the following action:

Dr. Henry L. Westermann, Pittsburgh, license revoked recently because of his breaking parole after conviction in federal courts.

The Texas State Board of Medical Examiners recently reported:

John G. Townsen, Lampasas, Texas, license reinstated July 30; it was revoked in 1934.

The State of Utah Department of Registration recently reported the following action:

Dr. Afton M. Livingston, whose last known address was Manti, Utah, license restored August 1.

Society News.—The American Social Hygiene Association announces the fourth annual Social Hygiene Day to be observed Feb. 1, 1940. Plans indicate that there will be more than 5,000 community and regional meetings will be over the country. Among features of the observance will be the release of a new sound motion picture entitled "With These Weapons." Those desiring information concerning participation in the observance are asked to write to Social Hygiene Day Service, American Social Hygiene Association, 50 West Fifth Street, New York.—The United States Chapter of the International

College of Surgeons will hold its fourth annual assembly at Venice, Fla., Feb. 11-14, 1940. There is no registration fee. For general information address Dr. Fred H. Albee, 57 West Fifty-Seventh Street, New York; for information about presentation of papers or exhibits write to Dr. Charles H. Arnold, secretary of the scientific assembly, Terminal Building, Lincoln, Neb.—Dr. Amos L. Beagler, Denver, was elected president of the American School Health Association at the annual meeting in Pittsburgh in October.—The American Student Health Association will hold its annual meeting at the Hotel New Yorker, New York, December 28-29.—New officers of the Central Neuropsychiatric Association are Drs. Percival Bailey, president, Chicago; Francis A. Ely, Des Moines, vice president, and William C. Menninger, Topeka, Kan., secretary-treasurer. The 1940 session will be held in October in Milwaukee.—The Phi Lambda Kappa Medical Fraternity will hold its thirty-second annual convention in New York December 30-January 1 at the Park Central Hotel.

Eighth American Scientific Congress.—The Department of State announces that the Eighth American Scientific Congress will be held in Washington, D. C., May 10-18, 1940, under the auspices of the government of the United States. The meeting will be one phase of a celebration of the fiftieth anniversary of the founding of the Pan American Union. The congress will be divided into the following sections: anthropologic sciences, biologic sciences, geologic sciences, agriculture and conservation, public health and medicine, statistics, history and geography, international law, public law and jurisprudence, economics and sociology, education. The official languages will be English, Spanish, Portuguese and French. Papers may be presented in any of these languages and arrangements will be made for presentation of the papers or résumés thereof in the other languages. Secretary of State Cordell Hull has appointed the following organizing committee to cooperate with the Department of State in formulating plans:

The Honorable Sumner Welles, under secretary of state, chairman.
Warren Kehlner, acting chief, division of international conferences, Department of State, vice chairman.

Alexander Wetmore, Sc.D., assistant secretary, Smithsonian Institution, secretary and secretary general of the congress.

Charles G. Abbot, LL.D., secretary of the Smithsonian Institution.
Isaiah Bowman, LL.D., president, Johns Hopkins University, Baltimore.

Vannevar Bush, D.E., president, Carnegie Institution of Washington.
Ben M. Cherrington, Ph.D., chief, division of cultural relations, Department of State.

Mr. Laurence Duggan, chief, division of the American republics, Department of State.

Dr. Ross G. Harrison, New Haven, Conn., chairman, National Research Council.

Waldo G. Leland, secretary, American Council of Learned Societies.
Mr. Archibald MacLeish, librarian of Congress.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service.
Stuart A. Rice, Ph.D., chairman of the Central Statistical Board.

Leo S. Rowe, LL.D., director general, Pan American Union.
James Brown Scott, J.U.D., trustee and secretary, Carnegie Endowment for International Peace.

This congress is an outgrowth of the First Latin American Scientific Congress held in Buenos Aires in 1898. The second was in Montevideo in 1901 and the third in Rio de Janeiro in 1905. In 1908 the United States was invited to participate and the name was changed to the First Pan American Scientific Congress. Subsequent meetings were held under this name in Washington in 1915, Lima, Peru, in 1924 and Mexico City in 1935. The latter session, in recognition of the continuity of the preceding congresses, was called the Seventh American Scientific Congress.

FOREIGN

Kitasato Institute Twenty-Five Years Old.—The Kitasato Institute for Infectious Diseases celebrated its twenty-fifth anniversary November 5. The institute was founded by Baron Kitasato, the Japanese bacteriologist who discovered the bubonic plague bacillus, after he had served many years as director of the Imperial Japanese Institute for the Study of Infectious Diseases. Baron Kitasato was born in 1856 and died in 1931.

Ear, Nose and Throat Congress Postponed.—The committee of the Fourth International Oto-Rhino-Laryngological Congress, which was to have been held in 1940 in Amsterdam, has been postponed indefinitely. Dr. A. Marres, Willemsparkweg 31, Amsterdam, is secretary of the congress. The committee expresses the hope that "the present horror will give way to better times and that at some future date it may be granted to us to send our invitation once more to the otorhinolaryngological world."

New Medical Center in Sweden.—The Carolinian Hospital, part of a new medical center in Stockholm, Sweden, is nearing completion, according to a recent announcement. The hospital will provide accommodations for about 1,500 patients

and more than 1,000 doctors, nurses and other personnel. On the roof of the main buildings there will be a sun terrace 650 feet long. A mural painting on the ceiling of the vestibule by Prince Eugen of the royal family represents the aims of medical science. Provision is being made to protect the hospital from air raids. Subterranean rooms are being blasted in the rock under the hospital to make shelters and an emergency hospital. The medical center, which includes numerous buildings for research, isolation, administration, training, housing and a college of nursing, will provide training and study facilities for the students of the Carolinian Medico-Surgical Institute, which is gradually moving into the new premises. Among buildings already opened are a home for the crippled and the "Radium Home," a cancer hospital. The eventual cost of the center will be about \$10,000,000, of which about two thirds has been expended.

Deaths in Other Countries

Edward Palmer Poulton, senior physician to Guy's Hospital, London, England, died October 18 at Tunbridge Wells, aged 56. Dr. Poulton was well known for his work on several editions of Taylor's Practice of Medicine.—**Prof. Dr. Freiherr v. Eiselsberg**, head of the First Surgical University Clinic at Vienna, aged 79, died October 26 of skull fracture resulting from a railroad accident en route from his estate near Wels to Vienna. Professor Eiselsberg and Dr. Julius Wagner-Jauregg were the only two remaining in good health who had seen the brightest period of the Medical Faculty of Vienna.—**Dr. Wilfred Trotter**, sergeant surgeon to the king of England since 1932 and professor of surgery at the University College Hospital Medical School, died November 25 at Blackmoor, Hampshire, England, aged 67.

Government Services

Dr. Griffiths Goes to Puerto Rico

Dr. Thomas H. D. Griffiths, senior surgeon of the U. S. Public Health Service and director of the Henry R. Carter Memorial Laboratory, Savannah, Ga., has been transferred to Puerto Rico and the Virgin Islands, it is reported. He will be succeeded at the laboratory by Dr. Charles M. McGill, assistant surgeon, U. S. Public Health Service. Dr. Griffiths has been in Savannah since 1937, when the memorial laboratory was opened.

New Members of Advisory Cancer Council

Drs. Max Cutler, director of the Chicago Tumor Institute, and George M. Smith, research associate in anatomy, Yale University School of Medicine, New Haven, Conn., have been appointed members of the National Advisory Cancer Council to succeed Dr. Ludvig Hektoen, Washington, D. C., and Clarence C. Little, Sc.D., Bar Harbor, Maine, whose terms have expired. The Council held its first quarterly meeting in the new National Cancer Institute near Bethesda, Md., December 4. Continuing members are James B. Conant, Ph.D., president of Harvard University, Cambridge, Mass.; Arthur H. Compton, Ph.D., Chicago; Drs. Mont R. Reid, Cincinnati, and James B. Murphy, New York.

Positions Open at St. Elizabeths

The United States Civil Service Commission announces open competitive examinations for two positions as junior medical officer at St. Elizabeths Hospital, Washington, D. C., one a rotating internship and the other a psychiatric residency. Both carry salaries of \$2,000 a year. The internship consists of a rotating service of four months of surgery, four months of acute medical service, four months of chronic medical service, two months of obstetrics, two months of pediatrics, three months of general laboratory work and six months of psychiatry. The residency is a postgraduate internship of one year, offered to graduates in medicine who have already served an accredited internship. Application forms may be obtained from the secretary of the board of civil service examiners at any first class post office, from the commission at Washington or from the district office in any of the following cities: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, Balboa Heights, C. Z., and San Juan, P. R.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 11, 1939.

The Chemotherapy of Infected War Wounds

The war office has distributed to all officers of the Royal Army Medical Corps a memorandum on the treatment of infected war wounds by the sulfonamide derivatives which may be taken as reflecting the authoritative British view on these substances. As they have been shown to be effective in streptococcal infections and also to have an action on anaerobic gas forming bacilli, it is recommended that they be given a trial in the field. The earlier the treatment the better the result, but some benefit may be anticipated even in established infections. All wounds which appear likely to become the site of secondary cocci or gas gangrene infection should receive as soon as possible a prophylactic course of sulfonamide treatment, which should occupy about forty-eight hours. For developing or established infections the course should extend over ten days, but if not then effective an interval of forty-eight hours should be allowed before continuing treatment. When an infection appears to be controlled, as judged by the temperature, small doses should be continued for a further three to five days in order to prevent relapses. The principle of effective treatment is to obtain a high blood concentration of the drug as soon as possible and to maintain this at an effective level for a time. As the drugs are rapidly excreted, to maintain an effective level it is necessary to administer them at four hour intervals day and night.

The dose of sulfanilamide recommended for prophylaxis is 4 Gm. at once followed by 2 Gm. after four hours and then by 1 Gm. every four hours day and night. If, after ten days, infection is still uncontrolled, allow an interval of forty-eight hours and then repeat the same course from the beginning or, if available, change to sulfapyridine. If infection appears to be controlled during the first or later courses, reduce the dose to 0.5 Gm. and continue for three to five days after the temperature has become normal. If during the first course of treatment no effect is evident in three days, a change to sulfapyridine is recommended.

For sulfapyridine treatment powdered tablets should be administered in milk or water. If vomiting is troublesome the dose should be split and administered at shorter intervals. For prophylaxis 3 Gm. should be given at once followed by 2 Gm. in four hours and then by 1 Gm. every four hours day and night for forty-eight hours. Soluble sulfapyridine is of great value when swallowing is impossible or gastric trouble prevents absorption. It may be injected intramuscularly or intravenously in doses of 1 Gm. every four hours day and night. The prophylactic course is completed in forty-eight hours. For treatment the course may be continued for ten days, but a change should be made to the oral compound as soon as possible. The soluble compound finds its best use in the initial phases of a course of treatment and should not be regarded as a substitute for the oral compound. It should be used for a continuous course only when oral therapy is impracticable.

Traffic Accidents Increased by the Blackout

The danger of air raids prevents street lighting and compels the screening of traffic lights and the confining of illumination to interiors. The result at night is a condition of darkness for which the term blackout is used. The result is a great increase in traffic accidents. In October 919 persons were killed in these accidents, against 641 in October 1938 and 1,130 last September, the first month of the blackout. The returns show for the first time the number of fatalities during the hours of darkness. Of 572 pedestrians killed in October, 424 were killed in the darkness; the total number of persons

killed was 564. In London the fatalities in October numbered 131, of which eighty-four occurred in the darkness. If the number of deaths in road accidents in the blackout continues at the present rate, in a three years war it will total nearly 40,000. At a press conference arranged by the "National Safety First Association," it was stated that an analysis shows that about one third of those killed in traffic accidents since the war started were over 70 years of age, one third between 60 and 70, one sixth between 50 and 60, and one sixth under 50. If elderly people refrained from going out during the blackout except when absolutely necessary, accidents would be greatly reduced. It has been found that a large percentage of the accidents are caused by pedestrians stepping into the path of a car in the belief that the driver would see them. The pedestrian has not been able to get rid of his peace time road psychology and thinks he will be seen.

Special Types of Injuries in Air Raids

The extent of the arrangements for the treatment of injuries to civilians in air raids is shown by the provision by the government of special centers where certain types of disability can be collected and treated by specialist staffs. But it is recognized that in the early stages of an emergency it is likely to prove impracticable to divert systematically these cases to such special centers, owing to difficulties in switching suddenly over from a central peace time to a decentralized war time organization, and to the impossibility of foreseeing the conditions in which it will be necessary to work in the first instance. Nevertheless the locality of the special centers is being pre-arranged and they will function at the earliest possible moment. In the case of neuroses uncomplicated by any injury, an endeavor will be made from the outset to dispose of those requiring special treatment, that is, unfit to be sent home, by sending them to the special institutions to be established. Plans are being made for collecting from the central hospitals such special equipment as is necessary. Specialist staffs also are being selected.

The Illicit Drug Traffic

In spite of the efforts of the League of Nations to check the illicit drug traffic, it still continues on a large scale. In the House of Commons a member pointed out that, while good work toward its suppression has been shown by most governments, the Japanese fostered the consumption of drugs not only in China but all over the world, including Canada, and they smuggled cocaine into India.

Mr. Butler, undersecretary for foreign affairs, said that the government viewed with grave concern the drug situation described by the Opium Advisory Committee last June and reviewed by the League of Nations this autumn. A serious feature was the growth of the use of heroin, the effects of which were far more serious than those of opium. In 1936 there was an Anglo-Japanese drug traffic agreement. No immediate action followed till they arranged this autumn for closer cooperation with the Japanese government. The information in his possession did not show that the increase of the drug traffic in China was the outcome of any deliberate plan of the Japanese government. In North China, the central government attempted to enforce drastic opium and narcotic laws, but since the Japanese occupation these deterrents had disappeared. In central China the position did not seem so serious. The British government intended to continue its efforts in cooperation with other governments.

Closure of the Ductus Arteriosus—A Correction

In the London letter in *THE JOURNAL* June 24, page 2617, reference was made to the paper by Barclay, Barcroft, Barron and Franklin in the *British Journal of Radiology* reporting identification of the ductus arteriosus in the newborn lamb. The same authors in the September issue of the *British Journal*

of Radiology report that, since that time, owing to improvements in technic, they have found that their report was erroneous. The shadow which was then described as that of the ductus is really that of a branch of one of the pulmonary arteries.

BERLIN

(From Our Regular Correspondent)

Nov. 8, 1939.

Race and Heredity

Since the report on heredity and race in *THE JOURNAL* July 29, page 434, additional information has become available. It has been decided to avoid using the term "Aryan" in official publications. Dr. Gross, director of the state bureau of race and politics, explained this to an assembly of leaders of the Hitler Youth movement. It is difficult, he said, to define the term "Aryan" because the expression is derived from philology and does not always coincide with present racial knowledge. For that reason the terms cross breeds (*mischlinge*) of the first and second grade have been adopted. This corresponds to terminology used in cattle raising. (See *THE JOURNAL*, Sept. 8, 1934, p. 764, for criticisms of the use of "Aryan" in the sense given it in Germany.)

A race museum is to be founded in Berlin to serve primarily the idea of race significance as a universal political concept. Attention is called to the remarks made by an official representative at the second university week at Karlsruhe: "Efforts to measure race craniologically are likely to introduce explosive matter into the unity of the German people." Heretofore cranial measurements as factors in race determination have been popular. A Jewish physician in Hamburg, 52 years old, was sentenced in July of this year to fifteen years in the penitentiary and ten years of civic degradation because of being involved in five cases of race pollution; that is, intercourse with Aryan women. To promote the study of heredity, local health bureaus have been ordered to keep official records of multiple births; that is, of twins, triplets and so on, as well as records of consanguineous marriages. Statistics of this kind are regarded as valuable for the biology of heredity.

Hereditary diseases are also exploited with official approval on the stage. A strolling theatrical company is presenting a play which in itself is of no significance and perhaps would never have been written or shown without government support. The play hinges on the idea that epilepsy was discovered in the bridegroom. The betrothal is annulled and the man sterilized. This play was presented also during a "district cultural week."

The danger of asocial persons to the welfare of the nation has been made the object of extensive investigations by the same bureau on race and politics in Bremen and Saxony. It is alleged that the evaluation of the facts already secured makes possible proof that asocial persons constitute a biologic danger. The first publication of the results of investigation concern three asocial families. Dr. Knorr, of the same bureau, regards asocial persons as an inferior biologic stock and the task of reducing the progeny in such families as the most important problem in the purification of heredity stocks. While the size of the average German family is insufficient to prevent a decline in population, the number of children in asocial families is several times as large. The investigations conducted did not deal with criminals and gypsies but with asocials who stand out not because of individual criminal acts but because of their general incapacity for social cooperation. On the basis of these investigations, Knorr contradicts the customary view that asocials are found in families otherwise useful and that their descendants ought to be preserved. The investigations, he says, show that nearly all members of investigated families and their kin are incapable of social cooperation. These asocial characteristics have been transmitted by heredity. The offspring of such marriages is unusually high. The menace

represented by asocials is not of a medical nature but one of character. A law making it possible to sterilize such descendants who have early manifested asociality would essentially reduce this inferior social stock within a few generations. It was stressed that asocial persons may not be placed in the same category with persons hereditarily diseased in the legal sense of the word.

COPENHAGEN

(From a Special Correspondent)

Nov. 21, 1939.

The Serum Treatment of Poliomyelitis

The waves of poliomyelitis which have swept over Denmark almost every late summer and autumn in recent years should have given opportunities, one would have thought, for testing the efficacy of the serum of convalescents. In the outbreak of 1934, for example, serum was administered in about 80 per cent of all the well defined cases, and Dr. Claus Jensen, who undertook a statistical study of this year's cases, formed a favorable opinion of this treatment. Yet faith in it has languished ever since, many clinicians, as distinct from statisticians, having been disillusioned in this matter. So when in 1937 a new outbreak occurred, the Blegdam Fever Hospital serving Copenhagen dispensed with this treatment. It was only in the provinces in 1937 that a lingering belief in the efficacy of serum secured its employment in a limited number of cases.

In 1939 Dr. E. Juel-Hemmingsen and Dr. G. Rasch issued a study of this problem with reference to the outbreak of poliomyelitis in 1937. They sent a questionnaire to the hospitals, which had dealt with more than a thousand cases that year, and analyzed the answers. In the provinces there were 489 patients receiving serum treatment and 400 who received no serum. While 60 per cent of the latter developed paralysis, only 33 per cent of the recipients of serum did so. Another comparison, much less favorable to serum, was made between 409 serum-treated patients who were not paralytic on admission to the hospital and 200 patients who were not given serum and who were also not paralytic on admission. Subsequently 18.1 per cent of the serum-treated group and 19 per cent of the controls developed paralysis. The scoffing clinician must feel tempted by such results to suspect the statistician of being capable of coming to any result he likes by an adroit reshuffling of the cards. At all events in Denmark at present there is a conviction that the wholesale early treatment of poliomyelitis with the serum of convalescents still lacks convincing proofs of its efficacy.

The Pirquet or the Mantoux Test?

The Norwegians usually employ the Pirquet test, while the Danes prefer the Mantoux test, which they consider much more delicate and accurate. The Norwegians have found that two consecutive Pirquet tests on Mantoux-positive persons give positive reactions in from 90 to 95 per cent. Thus they consider good enough and they continue to prefer the Pirquet test for wholesale examinations of children, holding that its comparative simplicity compensates for the small margin of error inherent in it. The Danes, however, have found that only from 50 to 70 per cent of their Mantoux-positive reactors also give a positive reaction to the Pirquet test; hence the disfavor into which it has fallen in Denmark. Swedish observers are, on the whole, inclined to side with the Danes in this matter, though tuberculin testing in Sweden has not brought such general discredit on the Pirquet test as it has in Denmark.

To clear up this minor dispute, Dr. T. Madsen, of the State Serum Institute in Copenhagen, and Dr. O. Scheel, of the Ullevaal municipal hospital in Oslo, arranged a combined Norwegian-Danish investigation. Dr. J. Holm represented Denmark and Dr. H. J. Ustvedt represented Norway. They worked together in Copenhagen, testing 258 school children

and seventy-two young adults. When the Pirquet test was repeated twice, it gave a positive reaction in 90 per cent of the Mantoux-positive children and in 87 per cent of the Mantoux-positive young adults. These investigators suggest that reinfections maintain sensitiveness to tuberculin and that the more a community is rid of tuberculosis the greater will be the proportion of Pirquet-negative persons among the Mantoux positive. And Norway, with its comparatively high tuberculosis morbidity, must therefore provide a greater proportion of Pirquet-positive reactors than Denmark.

Gonorrhea and Modern Chemotherapy

In a report recently presented to the Danish Medical Society, Dr. Aage Kristjansen produced statistics on the treatment of gonorrhea at the Rudolph Bergh Hospital in Copenhagen. In 1937 treatment of gonorrhea with the sulfanilamide group of drugs was instituted, and by the end of June 1939 between 400 and 500 patients had been treated with a Danish preparation of sulfanilamide or the English preparation sulfapyridine. A comparison of the effects of these two preparations was so unfavorable to the former that sulfapyridine has displaced it altogether. While sulfanilamide is apt to be inert early in the disease, sulfapyridine seems to be equally potent whatever the stage of the disease or the sex and age of the patient. Sulfapyridine possesses the further advantage of inflicting fewer and less serious complications and manifestations of drug intolerance than sulfanilamide. Now that a recent attack of gonorrhea can be more readily cured under ambulatory conditions, the claims on hospital beds for the treatment of gonorrhea have dwindled enormously. In 1930 about 59 per cent of the 180 beds in the Rudolph Bergh Hospital were required for the treatment of venereal disease, whereas at present only 10 per cent are required for this purpose. This decline cannot be credited exclusively to the sulfanilamide group of drugs, for bismuth compounds have also played a part in reducing the number of patients requiring hospital treatment for syphilis.

BUENOS AIRES

(From Our Regular Correspondent)

Oct. 14, 1939.

Cultural Relations with the United States

The number of Argentine physicians and members of other scientific professions who go to the United States for postgraduate studies has increased during the last few years, especially through Professor Houssay's influence. The number is increasing still more because of present conditions in Europe. The main difficulty is the increased rate of exchange, which makes the cost of living and the expense of the trip very high. Requests have been made of American steamship companies to make special reductions for students, such as are allowed them by English, Italian, German and French steamship companies; namely, a reduction of 25 or 50 per cent. However, no reduction is allowed on American ships. The number of persons who may go to the United States with Argentine scholarships is not more than twelve a year. They have scholarships from the Comisión Nacional de Cultura, Asociación Argentina para el Progreso de las Ciencias and Academia Nacional de Medicina. They are persons who are devoted to research or to teaching and who had secured positions on their return home. Argentines who have been sent to foreign countries with scholarships have obtained important positions in Argentina, such as professors in faculties, heads of laboratories or of some national institution. A reduction in the cost of the trip would aid the financial condition of students.

Medical Congresses

During the present year the Academia Nacional de Medicina of Buenos Aires held a monthly meeting for the discussion of allergy. Official speakers were Prof. A. Sordelli (who discussed

classification of phenomena of allergy and hypersensitivity), Prof. B. A. Houssay (physiologic mechanisms of allergy), Prof. A. Bachmann (allergy and anaphylaxis) and Prof. P. I. Elizalde (pathologic anatomy). Drs. P. Baliña, Segura, Argañaraz, Castex, Raimondi, Bullrich, Araoz Alfaro, E. Finochietto, P. I. Elizalde, Peralta Ramos and Cabanne discussed allergy in relation to dermatology, otorhinolaryngology, ophthalmology, renal diseases, asthma, circulatory diseases, tuberculosis, serum sickness, pediatrics, gynecology and obstetrics, and odontology.

The Asociación Médica Argentina held two meetings, at which the official topics were respectively gastrointestinal hemorrhages and adrenal insufficiency. Drs. J. T. Lewis, E. B. del Castillo, E. Hug and M. Soto were official speakers at the second congress.

The Congreso Argentino de Cirugía held its annual reunion October 8-13 under the chairmanship of Dr. Roberto Sole. The Brazilian delegation was represented by Drs. A. Monticoro and J. Gudín. Drs. García Valenzuela and Vargas Molinare, of Chile, and Ramon Doria, of Paraguay, also were present. The first official topic was "calculi of the biliary tract." Official speakers for the first topic were Prof. E. Blanco Acevedo, of Montevideo, and P. Mirizzi, of Córdoba. Drs. A. J. Bengolca, Velasco Suarez, D. del Valle and I. M. Allende read papers. Bengolca, who reviewed 972 operative cases, emphasized that special consideration should be given to the preoperative period. He advises against routine cholecystectomy and uses frequently the Kehr tube. Prof. P. Mirizzi performs, as a routine procedure, cholangiography during operation with the aim of determining the position of calculi. He advised supraduodenal choledochotomy for removing the calculi from the common bile duct. In many cases he sutures the common bile duct without any drainage. The satisfactory results of operations in biliary calculus obtained by Professor Mirizzi are well known. He does not believe in unnecessary delay before performing an operation in cases of calculous occlusion of the common bile duct. Professor Mirizzi recently published a book on the functions of the biliary tract. He states that cholangiography shows that in the functions of the biliary tract three different sphincters are concerned: Oddi's, the sphincter of the gallbladder and that of the hepatic duct, which exists immediately above the joint between the cystic and the hepatic ducts.

Profs. Eduardo Villa and Jose Puente discussed the second official topic, varices. Prof. E. Cornejo Saravia (a pupil of Prof. Pedro Chutro) was the speaker for the third official topic, treatment of malleolar and supramalleolar fractures. Surgical demonstrations were performed in all hospitals of Buenos Aires for three days.

Tendencies in Sanitation

Several subjects relating to the organization of medicine and sanitation were discussed at the Congress of Sanitation, recently held in Santa Fe. The following motions were approved: autonomy of the main department of hygiene, permanent positions for the technicians in sanitation, full time for the personnel working in sanitation, recognition of professional dangers, jubilation and retirement, extension of pre-nuptial certificates of health to women, and maintenance of medicine. It was resolved to organize the Congreso de la Asistencia Social, which will be held next year in Rosario.

Personals

Prof. J. J. Spangenberg was recently appointed, by the government, president to the Departamento Nacional de Higiene and to the Comisión de asilos y hospitales regionales.

Dr. Juan Bacigalupo was appointed professor of parasitology at the Faculty of Medicine of Buenos Aires. He will occupy the chair vacated by Dr. D. Greenway, who reached the age limit.

Prof. Jose Arce gave a lecture of farewell from his chair of surgical clinic, which he intended to resign, after which he decided to remain.

Dr. Atilio Costa was appointed professor of surgical technic at the Faculty of Medicine of Buenos Aires.

The following persons were presented with scholarships: Dr. Flaminio Vidal, a scholarship from the Rockefeller Foundation, to work with Dr. S. W. Ranson, of Chicago, on neurology, anatomy and physiology. Miss Inés López Colombo de Allende, a scholarship from the Asociación Argentina para el progreso de las ciencias, to work with Dr. G. W. Corner, of Rochester, N. Y., on sexual endocrinology of primates. Dr. E. de Robertis, a scholarship from the Academia Nacional de Medicina, to work with Dr. William Bloom, of Chicago, on histology. J. Llacer, a scholarship from the Asociación Argentina para el progreso de los ciencias, to work with Professor Benedetti-Pichler, of New York, on microchemistry.

Drs. B. A. Houssay, P. Belou and J. Arce recently celebrated their thirtieth and twenty-fifth anniversaries, respectively, as professors.

Deaths

Dr. G. Bosch Arana, professor of surgical technic at the Faculty of Medicine of Buenos Aires, recently died at the age of 53.

ITALY

(From Our Regular Correspondent)

Oct. 21, 1939.

Treatment of Inguinal Hernia

Professor Lanzillo, in a lecture recently delivered to the Società napoletana di Chirurgia, reported a technic for radical treatment of inguinal hernia which is based on the principle of making a solid posterior wall to the hernia. An incision is made on the large oblique muscle. The lower flap is passed behind the muscular layer of the small oblique and transverse muscles by means of a series of U stitches and is placed in front of the fascia transversalis. The upper flap together with the small oblique and transverse muscles are placed in front of the lower muscular flap and sutured to the bridge. A wall is thus formed in front of the fascia transversalis. It is made up of four layers, namely the lower flap of the aponeurosis of the large oblique, the transverse and small oblique muscles, and the upper flap of the aponeurosis of the large oblique. The cord, in accordance with the circumstances, may be lodged behind the fascia transversalis, between the fascia and the aponeurosis of the large oblique (which makes the back aspect of the wall newly formed), between the aponeuritic flaps or in the subcutaneous connective tissue. The speaker pointed out the advisability of cutting the epigastric vessels and Hesselbach's ligament, which is near the vessels, in the course of any operation for inguinal hernia.

Society Reunion

The Accademia delle Scienze Mediche e Chirurgiche met recently at Naples under the chairmanship of Professor Jappelli. Professors Bakunin and Deza-Cauget doubt the possibility of the formation of so-called total or partial blockage of the reticulo-endothelial system in living animals. From a review of the literature and from their experiments they believe that the phenomenon shows impregnation of the reticulo-endothelial system, which may cause a dysfunction of the system without causing absolute suppression of the function. The speakers adopted the name of impregnation of the reticulo-endothelial system for the phenomenon. The speakers studied rabbits which were impregnated with thorium dioxide sol administered intravenously, intraperitoneally or subcutaneously. Some such animals were inoculated with staphylococcus, streptococcus, pneumococcus or tubercle bacilli of the bovine type, whereas others were kept as controls. The results showed that, notwithstanding the fact that the organic resistance of impregnated animals is diminished in comparison to that of the controls, the lesions caused by staphylococcal infection on the tissues are more acute in the latter than in the former. In subcutaneous inoculation the

abscess formation takes place earlier in control than in impregnated animals and the toxic phenomena are slower in the former than in the latter. The lesions caused by intravenous inoculation are of the septicopyemic type in control and of a nephrosic and necrotic type in impregnated animals. In the groups of animals inoculated with tubercle bacilli of the bovine type the controls reacted with the common reactions, namely development of typical regional adenopathies. Impregnated animals developed massive infection with extensive lesions at the spleen, lungs, liver and adrenal cortex. Inoculation of tubercle bacilli by the intravenous route caused tuberculous lesions of the same acuteness and in the same time in both controls and impregnated animals. The most acute lesions were those of the lung. Tuberculous inoculations caused acute splenomegaly of the macroscopic and microscopic types of splenic lymphogranulomatosis in impregnated but not in control animals. Large reticulo-endothelial multinucleated cells which are commonly found in splenomegaly do not store thorium dioxide sol. However, the epithelioid cells and Langerhans giant cells of tuberculous granuloma had the substance stored.

Professor Bakunin spoke on surgical treatment of wounds and also on the influence of vitamins A and D on the evolution of wounds. The speaker reported a method which consists in early careful cleansing, preparation of the wound and removal of necrotic tissues no later than six hours after trauma, suture of any break in the continuity of the tissues (which may be covered with skin) and reduction of fractures or luxations, if any. The limb must be placed at rest, in an inclined plane, to improve the condition of circulation. It must be placed on sterilized cloth and put in a special wire device which is covered with gauze. The cloth and sterilized gauze are changed at intervals and all fluids eliminated are removed. Cod liver oil is applied to the wound every two or three days by means of a siphon bottle. The wound is free from direct contact with any medication as though it were enclosed in a chamber. The method is applied to wounds and burns. It is economical, easy and efficacious. Wounds or burns quickly heal with rapid formation of clean healthy tissues, a small elastic scar and never a keloid. The author pointed out that both wounds and burns are more or less extensive local lesions which cause pathologic repercussion in the whole system, especially in certain organs or tissues. The most grave organic conditions are those caused by local shock, intoxication from reabsorption of substances which originate in scattered tissues and consequent regeneration of the cells. The anabolic and catabolic changes from trauma have an influence on the whole system. From this point of view one can see that cod liver oil, locally applied, acts directly on the focus and indirectly on the general condition. The efficacy of the treatment is due to vitamins A and D in cod liver oil and probably also to some other substance contained in it.

Marriages

JULIAN LOMBARD, New Orleans, to Miss Bess C. Sheppard of Dallas, Texas, in New York, October 14.

JOHN FAULKNER RAINY, Greenville, S. C., to Miss Caroline Freeman Stringer of Anderson, October 28.

SIDNEY M. REICH, Wilkes-Barre, Pa., to DR. SYLVIA J. RUBENSTONE of Philadelphia, October 7.

JULIUS LIPSON, Otisville, N. Y., to Miss Netty D. M. Blok of The Hague, Netherlands, October 6.

HOWARD S. REID, Cohasset, Mass., to DR. NANA L. ROSENTHAL of Des Moines in October.

GEORGE TOLSTOI, Washington, D. C., to Lenore Oslander of Uniontown, Pa., September 10.

J. ELLIOTT ROYER, Oakland, Calif., to Miss Helen Hay in Reno, Nev., in September.

Deaths

DEATHS

2255

- James E. Sadler** * Poughkeepsie, N. Y.; Albany Medical College, 1887; member of the House of Delegates of the American Medical Association, 1909-1910, 1929-1932; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; fellow of the American College of Surgeons; past president of the Medical Society of the State of New York; medical director of a hospital bearing his name; attending surgeon to St. Francis Hospital; consulting surgeon of the Butterfield Memorial Hospital, Cold Spring, Northern Dutchess Health Service Center, Rhinebeck, and the Sharon Hospital; aged 74; died, October 9, of arteriosclerotic heart disease and coronary occlusion.
- Willard Burr Soper** * New Haven, Conn.; Columbia University College of Physicians and Surgeons, New York, 1908; associate professor of medicine at Yale University School of Medicine; member of the Association of American Physicians and the American Clinical and Climatological Association; fellow of the American College of Physicians; served during the World War; medical director of the William Wirt Winchester Hospital, West Haven, a tuberculosis unit of the New Haven Hospital; aged 56; died, October 30, in the New Haven Hospital of brain tumor.
- Patrick Chalmers Jameson** * Brooklyn; Long Island College Hospital, Brooklyn, 1892; member of the American Academy of Ophthalmology and Otolaryngology and of the American Ophthalmological Society; fellow of the American College of Surgeons; surgeon to the Brooklyn Eye and Ear Hospital, St. John's Hospital, Caledonian Hospital, Brooklyn Hospital and House of St. Giles the Cripple; aged 72; died, October 27, in the Long Island College Hospital of duodenal ulcer, pyloric stenosis and gastro-enterostomy.
- James Lyons Cobham** * Jersey City, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1917; fellow of the American College of Surgeons; assistant instructor in surgery at the New York Medical College and Flower Hospital from 1932 to 1935; consulting surgeon at the New Jersey State Hospital, Greystone Park; served during the World War; president of the medical staff of the Christ Hospital; aged 44; died, October 9, of coronary occlusion.
- James E. Murphy** * Hartford, Conn.; Medico-Chirurgical College of Philadelphia, 1909; member of the American College of Chest Physicians; for many years resident physician to the Wildwood Sanatorium; on the staffs of the Manchester Hospital, Hartford Municipal Hospital and the Hartford Hospital, where he died, October 31, of staphylococcal sepsis, aged 61.
- Walter Lee Munro** * Providence, R. I.; Harvard Medical School, Boston, 1885; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; consulting surgeon to the Rhode Island Hospital, Joseph's Hospital and the Miriam Hospital, Providence, and the Memorial Hospital, Pawtucket; aged 82; died, October 23, in the Jane Brown Hospital.
- Clarence Whittemore**, Johnson City, N. Y.; Jefferson Medical College of Philadelphia, 1913; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; for many years member of the board of education; on the staff of the Charles S. Wilson Memorial Hospital; aged 48; died, October 23, of heart disease.
- Henry Esson Young**, Victoria, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., 1888; past president of the Western Branch of the American Public Health Association; provincial officer of health; at one time Provincial Minister of Education and Provincial Secretary; aged 72; died, October 24, in a local hospital.
- George Myrtle Culver** * Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1894; past president of the Hudson County Medical Society; member and at one time member of the board of education; aged 73; died, October 19, of cerebral embolism and arteriosclerosis.
- Stephen Henry Besley** * Salt Lake City; Northwestern University Medical School, Chicago, 1924; aged 49; surgeon to the Utah State Prison and the Salt Lake County General Hospital; on the staff and member of the board of governors of the Holy Cross Hospital, where he died, October 7, of gallstones with multiple liver abscesses.
- William Hasbrouck Snyder** * Newburgh, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1895; member of the American Urological Association; past president of the Orange County Medical Society; at one time health officer; aged 66; died, October 17, in Rutherford, N. J., of coronary occlusion.
- Herman Frederick Thulin** * Denver; University of Nebraska College of Medicine, Omaha, 1900; on the staffs of St. Luke's Hospital, St. Anthony's Hospital, Mercy Hospital, Children's Hospital, Presbyterian Hospital, St. Joseph's Hospital and the Porter Sanitarium and Hospital; aged 62; died, October 17.
- Nels Christian Nelson** * Cheyenne, Wyo.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; for many years on the staff of the Laramie County Memorial Hospital; aged 66; died, October 15, in the Boulder (Colo.) Sanitarium of carcinoma of the pancreas.
- Ervin Lyman Matthews**, Morrilton, Ark.; University of Arkansas School of Medicine, Little Rock, 1908; member of the Arkansas Medical Society; past president of the Conway County Medical Society; served during the World War; on the staff of St. Anthony's Hospital; aged 54; died, October 17, of pneumonia.
- Frederick Gretton Brathwaite**, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890; associate medical director of the Equitable Life Assurance Society; aged 71; died, October 30, in the Stamford (Conn.) Hospital of lobar pneumonia and myocarditis.
- Frederick Adrian Kinch** * Westfield, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882; formerly secretary of the Union County Medical Society; president of the board of health; aged 79; died, October 25, of myocarditis and arteriosclerosis.
- Aloysius Robert Holdenried**, St. Louis, Mo.; St. Louis University School of Medicine, 1926; member of the Missouri State Medical Association; on the staffs of the Firmin Desloge Hospital, St. Mary's Hospital and the Deaconess Hospital; aged 38; died, October 14, of pulmonary tuberculosis.
- Albert Edwin Hayes** * Cranston, R. I.; Harvard Medical School, Boston, 1898; for many years on the staff of the Rhode Island Hospital, Providence; aged 72; died, October 26, at the Day Kimball Hospital, Putnam, Conn., of cerebral embolism and injuries received in an automobile accident.
- James Da Costa Highsmith** * Fayetteville, N. C.; Jefferson Medical College of Philadelphia, 1918; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; superintendent of the Highsmith Hospital; aged 49; died, October 18, of coronary occlusion.
- Edward Ludwig Paulsen**, Minneapolis; University of Minnesota Medical School, Minneapolis, 1909; member of the Minnesota State Medical Association; fellow of the American College of Surgeons; on the staff of the Deaconess Hospital; aged 56; died, October 7, of cerebral hemorrhage.
- Arley John Ostrander**, Cave Junction, Ore.; Minneapolis College of Physicians and Surgeons, Medical Department of Hamline University, 1908; on the staff of the Veterans Administration Facility; aged 59; died, October 15, of an accidental gunshot wound inflicted while cleaning a gun.
- Jacob Charles Rothenburg**, Springfield, Minn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; member of the Minnesota State Medical Association; formerly on the staff of St. John's Hospital; aged 79; died, October 16, of coronary occlusion.
- Will H. Moore** * Valley City, N. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; past president of the North Dakota Health Officers Association; aged 63; died, October 20, in a hospital at Fargo.
- Julius Emanuel Isaacson** * New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1918; aged 44; served in various capacities on the staff of the Hotel Dieu, Sisters' Hospital, where he died, October 17, of coronary thrombosis.
- William Henry Forbes**, Poughkeepsie, N. Y.; Indiana Medical College, Indianapolis, 1877; Jefferson Medical College of Philadelphia, 1879; aged 88; died, October 5, in the Vassar Hospital of hypostatic pneumonia and traumatic fracture of the hip.

John Edward Farrell ☉ Waterbury, Conn.; University and Bellevue Hospital Medical College, New York, 1903; served during the World War; aged 62; on the staff of St. Mary's Hospital, where he died, October 30, of myocarditis.

Karl Fischel ☉ Saranac Lake, N. Y.; Medizinische Fakultät der Universität, Wien, Austria, 1901; superintendent and medical director of the Will Rogers Memorial Hospital; aged 62; died, October 29, of coronary occlusion and arteriosclerosis.

Wilson H. Thompson, Celina, Ohio; Marion-Sims College of Medicine, St. Louis, 1899; Cleveland University of Medicine and Surgery, 1901; member of the Ohio State Medical Association; aged 61; died, October 19, of cerebral hemorrhage.

Frederick William Edelmann, Saginaw, Mich.; Bellevue Hospital Medical College, New York, 1885; at one time city health officer; for many years police surgeon; aged 75; died, October 23, in St. Mary's Hospital of carcinoma of the larynx.

Theodore Grady Gaskins ☉ Mount Vernon, N. Y.; Medical College of Virginia, Richmond, 1929; on the staff of the Mount Vernon Hospital; aged 35; died, October 30, of an accidental gunshot wound inflicted while cleaning a gun.

Claude Bradbury Parker, Gallipolis, Ohio; Medical College of Ohio, Cincinnati, 1895; member of the Ohio State Medical Association; aged 65; died, October 30, in the Holzer Hospital of cerebral hemorrhage.

David Nathan Hopkins, Friendship, Ohio; Cincinnati College of Medicine and Surgery, 1898; member of the Ohio State Medical Association; aged 70; died, October 31, in the Mercy Hospital, Portsmouth.

Malcolm Lale Samms, New Orleans; Kentucky School of Medicine, Louisville, 1901; on the staff of the Veterans Administration; served during the World War; aged 62; died, October 30, of heart disease.

Clyde Jacob Munns ☉ Newburgh, Ind.; Kentucky School of Medicine, Louisville, 1908; county health officer; aged 54; died, October 24, in the Welborn-Walker Hospital, Evansville, of abdominal carcinomatosis.

Fannie Herriott Kellogg, New Rochelle, N. Y.; New York Medical College and Hospital for Women, 1882; aged 82; died, October 9, of cerebral hemorrhage, hypostatic pneumonia and arteriosclerosis.

Martha Bell Moorhead ☉ Minneapolis; Woman's Medical College of Pennsylvania, Philadelphia, 1892; an Affiliate Fellow of the American Medical Association; aged 73; died, October 13, of bronchopneumonia.

Carl Daniel Kolset, Sanborn, Minn.; Medical Department of Hamline University, Minneapolis, 1905; served during the World War; aged 63; died, October 18, of bronchopneumonia and chronic encephalitis.

Myer Mordecai Pinsky, Camden, N. J.; University of Maryland School of Medicine, Baltimore, 1925; member of the Medical Society of New Jersey; aged 38; died, October 6, of coronary thrombosis.

Eugene Ziegler Hillegass, Mantua, N. J.; Jefferson Medical College of Philadelphia, 1880; member of the Medical Society of New Jersey; aged 85; died, October 8, of coronary thrombosis.

John Joseph Dooling, Malverne, N. Y.; Long Island College Hospital, Brooklyn, 1899; surgeon to the police and fire departments; aged 64; died, October 3, of carcinoma of the lung.

Bertram A. Martin, Mineral, Ill.; Northwestern University Medical School, Chicago, 1893; aged 69; died, October 30, in the J. C. Hammond City Hospital, Geneseo, of heart disease.

Joseph B. Chambers, Los Angeles; Manitoba Medical College, Winnipeg, Man., Canada, 1898; aged 83; died, September 22, of arteriosclerosis, hypertension and cerebral hemorrhage.

Wallace Andrew Aitken, Enid, Okla.; Washington University School of Medicine, St. Louis, 1901; served during the World War; aged 62; died, October 15, of uremia and nephritis.

Thomas K. Shields, Wheeling, W. Va.; University of Maryland School of Medicine, Baltimore, 1890; aged 74; died, October 7, of chronic nephritis, myocarditis and arteriosclerosis.

Thomas Owen Crawford ☉ Dewey, Okla.; Denver and Gross College of Medicine, 1910; superintendent of health of Dewey; aged 66; died, October 20, of pneumonia.

William Henry Kendrick, Tulsa, Okla.; Hospital College of Medicine, Louisville, Ky., 1897; aged 77; died, October 22, of hypertension, myocarditis and cerebral infarct.

Jefferson Martain Colburn ☉ Riverside, Calif.; Kansas City (Mo.) Homeopathic Medical College, 1895; aged 81; died, September 15, of herpes zoster.

Avery Kirk Brodie, Derby, N. Y.; University of Buffalo School of Medicine, 1899; aged 66; died, October 4, of coronary occlusion and arteriosclerosis.

Richard Edward Banks, Washington, D. C.; Howard University College of Medicine, Washington, 1927; aged 50; died, October 16, of cerebral hemorrhage.

Alexander Curtis Elinor, McKenzie, Tenn.; Memphis Hospital Medical College, 1912; aged 64; died, September 15, of diabetes mellitus and hypertension.

George Frederick Martin, Corydon, Ind.; Hospital College of Medicine, Louisville, Ky., 1884; aged 80; died, October 20, of carcinoma of the stomach.

John Henry Martin ☉ Binghamton, N. Y.; University of the City of New York Medical Department, 1877; aged 85; died, October 4, of myocarditis.

Mary Sophia Ross, Hannibal, Mo.; Rush Medical College, Chicago, 1908; aged 72; died, October 5, in Central Bedeque, Prince Edward Island, Canada.

James Madison Godwin, High Point, N. C. (licensed in North Carolina, year unknown); aged 79; died, October 13, of carcinoma of the mastoid.

Thomas Martin Eaton, Viola, Tenn.; Vanderbilt University School of Medicine, Nashville, 1884; aged 84; died, October 4, of influenza and senility.

George Lounsbery, Huntington, W. Va.; New York Homeopathic Medical College, 1878; aged 84; died, October 13, of pneumonia.

William Edgar Hardman, Annona, Texas; Missouri Medical College, St. Louis, 1889; aged 78; died, September 14, of diabetes mellitus.

Zachariah Garton Jones, Downey, Calif.; Kansas City (Mo.) Medical College, 1905; aged 55; died, September 19, of angina pectoris.

Henry Edward Pastor, Petaluma, Calif.; California Medical College, Oakland, 1894; aged 83; died, September 28, of heart disease.

John Sutherland Douglas, Halifax, N. S., Canada; University of Toronto Faculty of Medicine, 1916; aged 46; died, October 26.

Harvey Almond Hill, Amarillo, Texas; Rush Medical College, Chicago, 1898; aged 66; died, October 25, of carcinoma of the liver.

Alma Kruemcke, San Antonio, Texas (licensed in Texas, under the Act of 1907); aged 69; died in October of cerebral hemorrhage.

Horace Cooper Wrinch, Vancouver, B. C., Canada; Trinity Medical College, Toronto, Ont., 1899; aged 73; died, October 19.

Finlay Munroe, Paris, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1913; aged 50; died, October 27.

William Herbert Bell, Cincinnati; Miami Medical College, Cincinnati, 1886; aged 79; died, October 21, of bronchopneumonia.

Walter N. Thomas, Chicago; Reliance Medical College, Chicago, 1909; aged 59; died, October 18, of coronary occlusion.

Perry Jacob Shank, Cincinnati; Miami Medical College, Cincinnati, 1902; aged 80; died, October 25, of chronic myocarditis.

Jessie B. Conway, Los Angeles; Denver Homeopathic College, 1897; aged 77; died, September 10, of pernicious anemia.

Richard Beck Chapman, Laguna Beach, Calif.; Cooper Medical College, San Francisco, 1896; aged 65; died, September 22.

Clarkson P. Hockett, Spiceland, Ind.; Curtis Physio-Medical Institute, Indianapolis, 1893; aged 72; died, September 27.

Joseph Wilkinson, Regina, Sask., Canada; Manitoba Medical College, Winnipeg, 1897; aged 74; died, September 17.

Maura Bridget Flynn, Brooklyn; National University of Ireland, Dublin, 1924; aged 38; died, September 26.

Lebbeus Burton Schneider ☉ Troy, N. Y.; Albany Medical College, 1898; aged 62; died, September 19.

Correspondence

"CLINICAL GASTROENTEROLOGY"

To the Editor:—I wish to call attention to the review of my book "Clinical Gastroenterology," published in the September 2 issue of THE JOURNAL.

The reviewer states that "the text is amply illustrated. However, many of the x-ray films are obsolete, as evidenced by the presence of a ring to denote the position of the umbilicus on the plate. These, as the author does not state, are some of the older films of the late R. Walter Mills."

This statement is absolutely false for the following reasons:

On pages 60, 126, 150 and 240 it is definitely stated that the films are taken from Dr. Mills's original work.

On page 274 the films are taken according to Mills's original method of using small cylinder compression over the gallbladder region, and due credit is given him in the text.

Furthermore, I have never discontinued the use of the ring to locate the position of the umbilicus. This method is also being employed by many radiologists; therefore it is not true that the use of this ring indicates that the films are obsolete.

HORACE W. SOPER, M.D., St. Louis.

POLIOMYELITIS AFTER ADENOTONSILLECTOMY

To the Editor:—The subject of poliomyelitis following adenotonsillectomy is one of such importance that I submit the following tabulation of cases from the literature as a supplement to Dr. Felderman's letter in your issue of October 28. No case has been included in which the interval between operation and the onset of poliomyelitis was more than twenty-two days. The references will all be found in Stillerman and Fischer's paper (*Am. J. Dis. Child.* 56:778 [Oct.] 1938) except the one to the more recent paper of Koskoff, Amshel and Lebeau (*Arch. Pediat.* 56:19 [Jan.] 1939). The recent cases reported by Ayer and by Aycock are mentioned by Stillerman and Fischer as obtained by personal communication:

	Cases	Bulbar
Ayer (1928)	9	9
Aycock and Luther (1929)	16	11
Silverman (1931)	5	4
Stillerman and Fischer (1938)	13	9*
Aycock (1938)	2	2
Ayer (1938)	6	6
Eley and Flake (1938)	20	17
Koskoff, Amshel and Lebeau (1939)	2	2
Total	73	60 (82%)

* Including two cases of encephalitis.

As Stillerman and Fischer point out, the proportion of bulbar cases in poliomyelitis after adenotonsillectomy is so much higher than in poliomyelitis generally that the chances of its being accidental are statistically negligible (fifteen in 10,000 in their own series, in which the proportion is lower than in the totals of the compilation given in the tabulation). There seems to be little doubt that the operation provides a portal of entry through the traumatized cranial nerves supplying the tonsillar fossa and the nasopharynx to virus already present in that region. The studies of A. B. Sabin (Experimental Poliomyelitis by the Tonsillopharyngeal Route, *THE JOURNAL*, Aug. 13, 1938, p. 605) give experimental support to this contention.

HAROLD K. FABER, M.D., San Francisco.

LOST PATIENTS FROM AN OUTPATIENT CLINIC

To the Editor:—In *THE JOURNAL* of September 9, page 1037, appeared an article captioned "Lost Patients from an Outpatient Clinic" by Horace Gray, M.D., and Margaret Curtis, R.N. The report was made to determine the percentage of patients who could be persuaded to return to the clinic. The follow-up mailing system was used for this purpose.

The summary showed that the "clinic fails" amounted to 14 per cent, and the writers bemoaned the fact that from the point of view of social economy the results were most discouraging. Is it possible that the time spent by the clerical force on these patients is stretching the humanitarian purposes of dispensary work too far? This leads me to answer in the affirmative. Moreover, the present social system has a tendency to humor patients, often leading them to believe that the benefits derived are wholly shared by the dispensary physicians. In this assumption the outpatient patrons cannot be entirely blamed. The social service department, to justify its existence, must necessarily encourage a large active attendance of outpatients. The social worker makes it a point to cater to the whims of the patients in the same manner that a manager does to a temperamental metropolitan opera star.

I have had twenty years of clinical work and in my experience patients who apply for free treatment are those who feel that the best specialists can be found in hospitals. Moreover, they are under the impression that dispensary physicians are paid officials.

There are many reasons why patients fail to return to the clinic. First, the economic status of the family might have improved—a fact not disclosed in the follow-up system of Gray and Curtis. Of course lame excuses such as that the patient could not wait, that home duties interfered with treatment or that their automobile was not in working condition are but a few that account for the clinic "fails."

It would be considered somewhat gauche from an ethical point of view if a physician were to write a letter to his private patient asking him why he did not return for treatments. The patient would question the motive and his suspicions would be unduly aroused. The same sort of reasoning prevails with clinic patients.

Of course, ambitious social service workers and superintendents of hospitals devise ways and means of writing to patients so that the roll of clinic admissions can be lengthened. The same group has inspired the story about hospital costs and inadequate care of the sick in this country.

Some of the physicians engaged in the dispensary work feel that if the superintendents or social workers had their way they would install private cubicles for patients and have them enter or leave the place in some sort of disguise so that they would not be recognized. It has also been suggested that patients who are great lovers of music should have some sort of symphonic entertainment while waiting for treatment. It would help to chase away the tedium of monotony. Motion pictures too have their place.

I believe that the selfless idea of free treatments in the outpatient departments is overstressed, and physicians are opposed to have these patients brought back by postcard or telephone, no matter how scientifically interesting their conditions may be.

I strongly believe that 60 per cent of the patients admitted to the dispensary can well afford private treatment and that by crowding out the 40 per cent who are deserving of free treatments and who require no reminders they are jamming up the hospital machine.

If it is not ethical for a physician to solicit a patient, neither should it be the prerogative of a social worker to coax patients back to the outpatient clinic.

LEON FELDERMAN, M.D., Philadelphia.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CHOICE OF TREATMENT IN PNEUMONIA

To the Editor:—About two years ago a woman aged 62 had pneumonia of the right lower lobe. Because of lack of typing facilities she was given combined types I and II serum and also sulfanilamide totaling about 30 Gm. After about five days she complained of pain in the right upper quadrant and over the liver and lower part of the chest. Jaundice then appeared, and it was felt that she had hepatitis. Sulfanilamide as the cause was questioned, first because of the small total dose and second because of previous gallbladder (and liver?) dysfunction. Furthermore the pneumonia, which was in the right lower lobe, might have been contributory. After prolonged dextrose and oxygen therapy she recovered. Later she proved to have had type VII pneumonia. My questions are: 1. If this patient contracts pneumonia again, what would be the choice of treatment; sulfapyridine or serum? 2. Is it not true that she may now be sensitive to both? 3. Would there again be danger of hepatitis? 4. Has serum proved to be efficacious in elderly persons? 5. Do not most authorities, thus far, feel that sulfapyridine is, in such cases, apt to bring better results?

M.D., Iowa.

ANSWER.—1. The choice of the appropriate specific treatment for a patient suffering from pneumococcal pneumonia depends on such factors as the condition of the patient's liver, kidneys and blood-forming organs, the type of pneumococcus involved, the time of treatment and the presence of bacteremia, as well as the availability of remedies and of the skills required to use them effectively. All the indications and contraindications for the several available remedies have not been established. Patients suffering from the type III pneumococcus, especially with bacteremia, should receive sulfapyridine. Patients in the early stage of pneumonia of a type for which potent serum is available, if they are insensitive to the kind of serum to be employed, and patients who have failed to produce immunity as evidenced by the spread of the lesion may receive both serum and sulfapyridine advantageously. In the absence of contraindication, sulfapyridine may be given pending the report on laboratory work.

2. It does not follow from her experience that this patient is sensitized to either remedy, sulfapyridine or serum. Sulfapyridine sensitivity is probably not acquired from previous use but is due to vulnerability of tissues. If tissues have been severely injured by a previous administration, it is well not to give the remedy a second time. Patients are not necessarily sensitized by serum and, if sensitized, do not necessarily retain their sensitization for two years after the administration of either horse or rabbit serum. If the patient has become sensitized to a serum, serum from a different animal source may be employed or, if necessary, even from the same source by the method of inducing a refractory phase and antianaphylaxis, described by J. G. M. Bullowa (*The Management of the Pneumonias for Physicians and Medical Students*, New York, Oxford University Press, 1937, p. 309). There is no evidence that sulfanilamide sensitizes patients to sulfapyridine or that sulfapyridine cannot be used advantageously in a second attack of pneumonia after the first has been treated with that drug.

3. There is insufficient evidence presented for one to assert that this patient had hepatitis. Some hepatic damage may have resulted from the use of sulfanilamide or from her disease, or there may have been simultaneous cholelithiasis. It would be helpful to know the depth of the jaundice or whether blood phosphatase was increased.

4. Ample early doses of specific serum have been efficacious in the treatment of old persons suffering from pneumococcal pneumonia.

5. Some authorities feel that both serum and sulfapyridine should be used in the severe infections of old persons unless there is a specific contraindication for one or the other. Recovery from pneumonia ultimately depends on the operation of immunity factors, and in older persons the immunity mechanism may be feeble. Serum hastens the advent of an excess of antibody, which is required to neutralize specific capsular carbohydrate and to induce both phagocytosis and lysis. Sulfapyridine inhibits or kills pneumococci, provided an adequate concentration for the pneumococcus present is maintained for a sufficient length of time. The use of serum with sulfapyridine decreases the amount of sulfapyridine and of serum required. Old persons may suffer from azotemia after dosage with sulfapyridine because they frequently have impaired kidneys. Bone

marrow function, which is often feeble in the elderly, may be further depressed. No one has had sufficient controlled experience to be authoritative in expressing a preference for either type of treatment in the elderly as opposed to those in other periods of life.

BLOOD SEDIMENTATION

To the Editor:—What is the simplest blood sedimentation test, what technique is used and what are the normal readings? Does it make any difference whether sodium citrate solution 5 per cent or ammonium oxalate with potassium oxalate is used as long as the blood is prevented from coagulating? Why are both the ammonium and the potassium oxalate used? Would not one of them be enough? Is not use of Wintrobe hemocrit with one of the coagulants as simple and accurate as the Westergren method?

M.D., Minnesota.

ANSWER.—There is some difference of opinion regarding blood sedimentation tests. One of the simplest certainly is the Linzenmeier test. Linzenmeier tubes with calibrations at the 0, 6, 12 and 18 mm. levels are easily procurable and cheap. One and six-tenths cc. of blood drawn from the vein is mixed with 0.4 cc. of 3.8 per cent sodium citrate solution in a small medicine glass or evaporating dish and the tube is filled with the mixture to the 0 mark and allowed to stand upright in a small rack. For women from two to five hours is required for the blood to fall to the 18 mm. level. For men the time required is from three to seven hours.

With regard to the use of anticoagulants, experimental work has shown that sodium citrate solutions in the concentrations used with the Linzenmeier and Cutler techniques retard the sedimentation rate considerably. It has been found that the ammonium oxalate and potassium oxalate mixture as devised by Heller and Paul has no effect on sedimentation rate or erythrocyte cell volume. Potassium oxalate in 20 per cent solution may be used alone as the anticoagulant without producing any significant alteration of the sedimentation rate.

Use of the Wintrobe hemocrit with the mixture of ammonium and potassium oxalates as the anticoagulant would probably be as simple and as accurate as the Westergren method.

ANAPHYLACTIC REACTIONS AND HORSE SERUM

To the Editor:—I am writing to ask your advice as to the quickest and simplest method for skin testing children before administering horse serum. As part of my work as city physician I treat a number of cases of diphtheria, in most of which toxoid has been previously administered. Consequently the diphtheria is quite mild. On occasions I have used an intradermal test with a 1:10 dilution of the serum and have then waited twenty minutes for a reaction. This procedure is time consuming because the syringes in which our antitoxin is supplied have needles which are too large for intradermal use. Consequently it is necessary to sterilize a hypodermic syringe to perform this test. On other occasions I have simply placed one drop of undiluted antitoxin in the conjunctival sac. I have serious accidents ever been known to follow administration of horse serum when the conjunctival test was negative? 2. What test for sensitivity would you recommend under the circumstances mentioned?

M.D., Virginia.

ANSWER.—1. Yes, instances have been recorded in which death resulted from anaphylactic shock following the administration of horse serum to patients whose conjunctival tests for sensitivity had been negative. Unfortunate occurrences of a similar nature have also taken place notwithstanding that intracutaneous sensitivity tests to horse serum were negative.

2. The intracutaneous test for sensitivity which has been used is the one most commonly employed. When the ophthalmic test is performed a dilution of 1:10, as in the case of the intracutaneous test, is perhaps preferable to using undiluted serum. Sometimes a scratch test is made for the purpose of indicating susceptibility to horse serum. For practical purposes, under the conditions described, a scratch test might be sufficient.

As toxoid contains no horse serum and because toxin-antitoxin is used much less frequently than some years ago, it might be expected that fewer serum reactions would result than formerly. On the other hand, because of an increased use of scarlet fever antitoxin a certain number of children may have been sensitized to horse serum on that account. With the improved methods of concentration and refinement, antitoxin serum reactions seem to be much less numerous and far less severe than many years ago.

In some contagious disease hospitals, routine sensitivity tests are made on all patients to whom serum is to be administered. In other contagious disease hospitals no tests are made for sensitivity unless a history of previous serum administration has been obtained or some allergic condition is known to exist. In two contagious disease hospitals in which the latter plan is followed, many thousands of diphtheria patients have been treated without a single instance of an anaphylactic death.

CHLORAL HYDRATE AND WHISKY

To the Editor:—I recently read in Bastedo's *Materia Medica*, 1938 edition, that chloral hydrate should never be given with alcohol. A patient, after trying everything, gets more satisfaction from 2½ drachms (9.5 cc.) of a chloral preparation at 9 p. m. and 1½ ounces (45 cc.) of whisky in a tumbler of water at 10 o'clock. Is there anything in Bastedo's remarks as quoted that would apply to this? The patient never has to take anything for asthma during the day, but most nights one or two such doses between 10 p. m. and 6 a. m. For ten years he relied on epinephrine.

Nathaniel F. Cheever, M.D., Greenfield, N. H.

ANSWER.—Chloral hydrate should never be administered with alcohol in a prescription. The combination of chloral and alcohol results in the formation of chloral alcoholate, which used to be known as "knock-out drops" and is now termed a "Mickey Fina." Chloral alcoholate is a powerful and rapidly acting cerebral depressant. In prescriptions containing chloral and alcohol, the chloral alcoholate tends to rise to the surface. Without the proper shaking, the danger of acute intoxication from such a preparation is immediately apparent, since the patient receives all of the chloral at the first dose. The preceding remarks do not necessarily apply, however, to the conditions stated in the question. The patient is taking single doses of chloral hydrate with whisky, and the result is better hypnosis and deeper depression. The patient evidently requires this amount of depression to sleep in spite of his asthma and the only harm that can result will be the possible damage to the liver and other parenchymal tissues from the use of chloral hydrate and alcohol.

MIGRAINE

To the Editor:—A 50 year old white man for the past twenty years, with increasing frequency, has had attacks beginning with central blurred vision in the left eye, spreading peripherally and followed almost immediately by similar haziness in the right eye. Vision clears from right to left, completely leaving the right eye first and the lateral half of the left eye last. This phase always lasts exactly twenty minutes and is followed by pain behind the eyeballs which may last anywhere from one to twenty-four hours. The attacks occur at any time of the day, and the patient has even awakened in the morning with typical pain behind the eyeballs. Occasionally the attacks are accompanied by numbness of the hands, lips and tongue. Competent ophthalmologic examination reveals only a slight degree of sclerosis. Routine physical and neurologic examinations show no abnormality. The history is negative for head injury, and there is no family history of migraine, epilepsy or similar disorder. The patient is overweight, and three of his four children show varying degrees of Fröhlich's syndrome. What procedures should be adopted to establish a diagnosis?

M.D., Ohio.

ANSWER.—The diagnosis must be based on the history, as structural changes are unlikely to be found by roentgenograms or even by encephalogram or ventriculogram. The long history, sudden onset of the central scotoma, rapid course, pain behind the eyes, paresthesias of hands, lips and tongue and complete recovery from each periodic attack are typical of migraine. The lack of abnormal ophthalmologic features, absence of family history of migraine or epilepsy and signs of endocrine dysfunction in the children are also consistent with the diagnosis, although a large percentage of patients with migraine have a family history of attacks. Similar cases of migraine will be found in the classic descriptions of the disease as given by Airy, Living and others.

References:

- Airy, Hubert: On a Distinct Form of Transient Hemipia, *Phil. Tr.*, London 180: 247, 1870.
Living, Edward: On Megrim, Sick-Headache, and Some Allied Disorders, London, J. & A. Churchill, 1873.

PASSIVE VASCULAR EXERCISE

To the Editor:—What information can you give me on the present status of passive vascular exercise or other pressure-vacuum devices for the improvement of the circulation in arterial occlusion? Are any such devices Council accepted? What recent articles have appeared on this subject?

M.D., Minnesota.

ANSWER.—There is a wide difference of opinion relative to the clinical value of passive vascular exercise, a term used to designate alternate periods of suction and pressure applied to an extremity enclosed in some device such as a glass boot. Several such devices are accepted by the Council on Physical Therapy. The evidence that passive vascular exercise significantly increases the circulation to an extremity lacks impressiveness. In fact, there is no conclusive physiologic evidence that the circulation is improved. In spite of this, some physicians who have had wide experience with this method of treatment feel that definite clinical evidence of improvement in the circulation of persons suffering from arterial diseases results from it. Other physicians feel that the benefit noted does not result specifically from this particular treatment but that it is due in large degree to other methods of treatment carried out at the same time and to

natural processes of healing and to establishment of collateral circulation. Some physicians believe that passive vascular exercise is valueless. A fair summary of the situation is that the earlier enthusiasm for this treatment has subsided greatly.

References:

- Herrmann, L. G.: *Passive Vascular Exercises*, Philadelphia and London, J. B. Lippincott, 1936.
Allen, E. V., and Brown, G. E.: Intermittent Pressure and Suction, *The Journal*, Dec. 21, 1935, p. 2029.
Kountz, W. B., and Smith, J. R.: *Ann. Heart J.* 16: 55 (July) 1938.
Herrmann, L. G., and Reid, M. R.: *Ann. Surg.* 100: 750 (Oct.) 1934.

URINARY SEDIMENT

To the Editor:—For some time I have been seeing a peculiar sediment in the urine which I cannot identify, and I find no reference to it in any laboratory manual available. It is "black" masses of what appears to be pigment matter, not unlike the calcium bilirubinate pigment in bile. I found them in unusual numbers recently in a specimen showing heavy calcium output with Sulkowich reagent. Examination of the calcium sediment still showed a moderate number of these masses. Could they be calcium and therefore indicate excessive calcium elimination?

S. R. Salzman, M.D., Toledo, Ohio.

ANSWER.—It is almost impossible to give a definite reply as to the character of the "black masses." It might be discolored tyrosine. If so, it should be soluble in dilute alkaline or dilute sulfuric acid solutions. Such solutions, if not too weak or too acid or basic, should give a positive Millon reaction. The black masses might also be melanin. If so, one would expect the urine to be highly colored. The material should be somewhat soluble in alkaline solutions and should then be reprecipitated as brown to black material on addition of acid to the neutral point or slightly beyond. If a few drops of ferric chloride solution added to 100 cc. of urine produce a gray precipitate which darkens on addition of more ferric chloride, it is considered a positive test for melanin. Melanins should not be confused with indigo. If the dark masses are due to indigo, the material should dissolve in chloroform.

VERTIGO

To the Editor:—A patient's chief complaint is vertigo. A few nights ago she awakened to find herself extremely weak, nauseated and dizzy. She turned on the light and attempted to get out of bed, but the vertigo was so severe she was forced to lie down. She described the sensation as feeling "like the room was spinning around." She was so weak that it was an effort to lift her hand. She was given a small drink of whisky and shortly thereafter went to sleep. The next morning she apparently was all right until she got out of bed and walked a short distance, when the vertigo returned again and she had to hold to the wall to keep from falling. She was helped back to bed and after lying down a while felt all right again. The next day while lying on my examining table she suddenly grasped the table and became much alarmed. She said "something like a wind" had passed through her head in the occipital and mastoid regions, and the vertigo had returned again. She had no ringing in the ears and was not worse on lying on either side. This vertigo continued when the patient was in the erect position for twenty-four hours and then began to subside (during this time the patient was in bed) only to return again when she was up for several hours. Results of physical examination were negative except for a pulse rate of 54 per minute. This increased to 90 per minute during the attack. The blood pressure is 120 systolic and 78 diastolic. The urine and blood counts are normal. A blood Wassermann test is being done. Examination by a nose and throat specialist shows no abnormality except a minor error of refraction. Examinations to determine the condition of the labyrinth were not done. There is no nystagmus. This is apparently a case of pseudo Ménière's disease. I am considering the possibility of brain tumor. What other procedures may be done to make the diagnosis more definite? I have put the patient on a salt-free diet and am administering rather large doses of ammonium chloride. I should like advice on the treatment of such a condition and the prognosis as far as is known.

M.D., Georgia.

ANSWER.—True vertigo always indicates a disturbance of the labyrinth. Such disturbances may be transient functional affairs, organic disease in the labyrinth itself, disease of the nerves such as Ménière's syndrome and disease of the central nervous system at higher levels. Ménière's disease produces vertigo but this diagnosis cannot be safely made from the data given here, although the possibility should be thoroughly investigated. Brain tumor is another possibility.

The treatment of this condition must be based on more accurate diagnosis, and no prognosis can be hazarded until such a diagnosis is made. Tests to determine the cause of vertigo and to localize such causes constitute a rather highly specialized procedure and require an intimate knowledge of cerebral localization. A discussion of this subject, with references to original sources, may be found in most standard textbooks on neurology. Two such works are:

- Wechsler, I. S.: *A Textbook of Clinical Neurology*, Philadelphia, W. B. Saunders Company, 1935.
Grinker, R. R.: *Neurology*, Springfield, Ill., Charles C. Thomas, Publisher, 1934.

VISUAL DISTURBANCE AND SULFANILAMIDE

To the Editor:—A white man aged 33 had gonorrheal urethritis and cystitis. Besides the usual local treatment I prescribed sulfanilamide 2.4 Gm. daily for the first week and 1.8 Gm. for the second week. After that time the patient suddenly complained of visual disturbances, which made it impossible for him to drive his car. He was able to read a newspaper when it was brought near to his eyes. There was no headache or any other pain. The next day he had a temperature of 100.4 F. and a skin rash, limited to the face and forearms, which had been exposed to sunlight. The eye examination by an ophthalmologist revealed a definite myopia, which could be completely corrected by means of glasses. There was no ciliary spasm or optic neuritis. Sulfanilamide was interrupted and after five days the patient's eyesight was normal again. He never stopped working. Since I have not found a similar case in the literature concerning sulfanilamide I should like to know whether such a symptom has been observed before.

Manfred Landsberg, M.D., Cudahy, Wis.

ANSWER.—Instances of disturbances of vision in the course of sulfanilamide therapy are quite uncommon. Many patients may complain of difficulty in reading during sulfanilamide therapy, but this in general is due to an inability to concentrate well rather than to any disturbance in vision.

Paul C. Bucy (Toxic Optic Neuritis Resulting from Sulfanilamide, *THE JOURNAL*, Sept. 25, 1937, p. 1007) reported that a girl with osteomyelitis developed severe disturbances in vision because of a toxic optic neuritis after the administration of a single tablet (0.3 Gm.) of the drug. Four days elapsed before the child's vision was normal. Visual hallucinations have been noted. Temporary myopia has not been described.

FULGURATION OR DESICCATION OF MOLES

To the Editor:—Apropos of the query "Moles and Their Excision" in *The Journal*, September 16, page 1152, I should like to inquire as to the propriety of removing the moles, particularly the deeply pigmented ones, by means of fulguration, or desiccation. Women particularly are anxious and willing patients for the cosmetic improvement obtained, and while I have had excellent results so far, the thought of malignancy always obtrudes. Naturally, with the high frequency currents the tissue is totally destroyed (sufficiently beneath the corium), making pathologic study obviously impossible. Excision would leave scars. M.D., New York.

ANSWER.—The question of fulguration, or desiccation, of pigmented moles is to some degree controversial. Many physicians are of the opinion that this procedure is effective and without danger. This opinion is based on the treatment of large numbers of lesions by such methods without apparent complications. Another school believes that desiccation, or electrocoagulation, of pigmented moles is accompanied by the possibility of dissemination of the disease. This opinion is based on the clinical observation of patients who have been treated in this manner and who developed fully malignant melanomas in the treated areas. Numerous authorities on this question are of the opinion that the safest therapeutic procedure for a pigmented mole which is subjected to irritation or which is showing changes suggestive of malignant degeneration is careful, wide surgical removal.

TIGHT FORESKIN AND CIRCUMCISION

To the Editor:—In the newborn male child what is the best method of dealing with a tight foreskin of the penis? Is circumcision or just nicking, thus retracting it, the best measure? M.D., Pennsylvania.

ANSWER.—It is generally considered that the tight foreskin at birth may be safely let alone provided there is ample room for urination. If it is necessary because of blockage of the stream to make an opening, this can be done by breaking up the adhesions and retracting the foreskin or by circumcision, the choice of which procedure should rest with the family.

In most instances with tight foreskin if the physician and mother will be patient, retraction can be done after several months as a gradual procedure without any operation at all.

NITRAZENE TEST OF SALIVA

To the Editor:—Of what value is the nitrazene test of saliva in determining the body pH? Dr. Walter B. Guy, of Florida, suggests using a cantharides plaster for eight hours and then determining the pH from the plasma by means of phenol red. In making this test is it the aqueous or the alcoholic phenol red which is used as the indicator? Is there any special color chart to use? How reliable is this test?

Henry B. Hibbe, M.D., Dubuque, Iowa.

ANSWER.—The nitrazene test is a rough test for the pH of body fluids. The phenol red test, if properly applied, is more accurate. The phenol red solution is prepared by grinding in a mortar 0.03 Gm. of pure dye with 0.86 cc. of tenth normal sodium hydroxide and diluting the final solution to 100 cc. with distilled water. To apply the test, collect about 5 cc. of saliva by

expectorating into a test tube containing 2 cc. of neutral liquid petrolatum. Take 4 cc. of the saliva and add 0.2 cc. of the phenol red indicator solution. It is best to compare the color with standards of different pH values containing the same amount of phenol red. A color chart is published by William Clark in his *Determination of Hydrogen Ion Concentration*.

LUDWIG'S ANGINA

To the Editor:—Is there any evidence that Ludwig's angina ever assumes epidemic proportions? Particularly in the experience of the late World War was it more common except in the presence of oral injuries? In operating room technic is it considered more infectious than the ordinary pyogenic infections? M.D., Pennsylvania

ANSWER.—No evidence has been found that Ludwig's angina ever assumes epidemic proportions. While cervical cellulitis was common in the World War, Ludwig's angina was not and did not commonly complicate oral injuries. The causative organisms vary and are not regarded with any more concern in the operating room than any other acute infection.

NO HEREDITARY FACTOR IN FACIAL PARALYSIS

To the Editor:—A 35 year old housewife has a right peripheral facial paralysis. The etiology has been determined as exposure to an open window. The patient's father and older brother at one time in their lives also had attacks of peripheral facial paralysis. Can you tell me whether there is a form of familial peripheral facial paralysis and, if there is, can you tell me where I can find the articles describing it? M.D., New York.

ANSWER.—It is not believed that the facial paralysis in such cases has anything to do with familial periodic paralysis or any other familial disease. The disorder is so common that it might easily happen to affect several members of a family.

FEVER FOR BRONCHITIS AND ASTHMA

To the Editor:—Would fever cabinet treatments be of any value in chronic bronchitis and asthma? Has sulfanilamide been used in this condition. M.D., Illinois.

ANSWER.—The fever treatment for asthma was tried originally for severe intractable cases. Even for these, it has now been generally discarded as too severe a form of management for the results obtained. Sulfanilamide has not been tried for this condition. There seems to be no adequate basis for its trial.

WOOL SENSITIVITY IN WOOLEN INDUSTRY

To the Editor:—Do you know of any particular treatment the woolen manufacturers use on their employees that are allergic to wool? M.D., Michigan.

ANSWER.—The only two methods that can be used in wool sensitive cases are avoidance of contact or minimizing contact with virgin wool, and hyposensitization. The former is far preferable to the latter. It is hardly possible to decrease the amount of wool dust in wool manufacturing establishments. No information on a successful means used in wool sensitive patients who are compelled to remain in the industry has been found.

FELIX VI SERUM FOR TYPHOID

To the Editor: The phrase "Felix Vi serum against typhoid" has come to my attention. Any information you can give me on this item will be appreciated. D. Paul Ward, M.D., Fort Ontario, N. Y.

ANSWER.—Felix believes that one of the important components of the typhoid organism is the Vi (virulence) antigen. He has prepared an antiserum rich in Vi antibodies which he suggests for therapeutic and prophylactic application.

So far as known this serum is not commercially available in this country and is still in the experimental stage.

ZINC OXIDE INTRARECTALLY

To the Editor:—Can there be any deleterious results from using official zinc oxide intrarectally daily for chronic proctitis? M.D., Illinois.

ANSWER.—In considering any possible deleterious effects from the daily use of zinc oxide intrarectally, the local and possible systemic effect must be considered. Owing to its insolubility under the conditions mentioned, the degree of absorption of zinc oxide is practically nil. There is little likelihood of systemic or harmful local effects when zinc oxide is used for its soothing and protective action.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Written. Part I. Various places throughout the United States and Canada, March 28. Oral. Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul N. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF SYPHILOLOGY: November 1940. If sufficient are received before March 1, June 10-14. Sec., Dr. C. Guy Lane, Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Written. Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 8-11. Applications for admission to Group A, Part II examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Written. Various cities of the United States and Canada, March 2. (The only written examination in 1940.) Oral. New York, June 8-10. Formal applications must be received before Jan. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics, Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 18-19. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington D. C.

California July Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held at San Francisco, July 11-13, 1939. The examination covered nine subjects and included 90 questions. An average of 75 per cent was required to pass. Two hundred and fifteen candidates were examined, 204 of whom passed and eleven failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1938)		83.2.
85.8, (1939) 75.1, 75.9, 75.9, 76, 76.1, 78.8, 79.2, 79.7, 79.7, 79.8, 81.1, 81.2, 81.8, 82.4, 82.9, 82.9, 83.3, 83.8, 84.6, 84.8, 84.8, 85, 85.1, 85.8, 85.9, 87.3, 88.7			
Stanford University School of Medicine.....	(1938)		84.1.
(1939) 76.3, 77.8, 78.1, 78.4, 79.1, 79.2, 79.8, 79.9, 80.1, 80.6, 81.2, 81.7, 82, 82, 82.2, 82.4, 82.6, 82.6, 82.7, 82.8, 83.1, 83.1, 83.3, 83.3, 83.3, 83.7, 83.9, 84.6, 85, 85.4, 85.8, 85.8, 85.8, 86, 86.1, 87.1, 87.2, 87.8, 87.8, 88, 89.7, 89.8			
University of California Medical School.....	(1938)		85.6.
87, (1939) 75.1, 76.3, 78, 78.3, 80.6, 80.6, 80.7, 80.7, 81, 81, 81.1, 81.1, 81.3, 81.4, 81.8, 82.4, 82.3, 82.4, 82.4, 82.6, 82.6, 82.6, 82.6, 83.4, 83.6, 83.6, 83.6, 83.7, 83.8, 83.9, 83.9, 84.1, 84.3, 84.3, 84.6, 85, 85, 85, 85.3, 85.4, 85.7, 86.3, 86.6, 86.6, 86.7, 87, 87.1, 87.3			
University of Southern California School of Medicine (1939)			77.9.
78.1, 78.8, 81, 81.1, 81.1, 81.2, 81.7, 82, 83, 83.2, 83.4, 84, 84, 84.1, 84.2, 84.8, 86.4, 86.8, 87.7			
University of Colorado School of Medicine.....	(1938)		82.8
Northwestern University Medical School.....	(1938)	82,	(1939) 82.8,
Rush Medical College.....	(1937)		84.8
University of Illinois College of Medicine.....	(1938)	81.3,	(1939) 80.3, 81
Indiana University School of Medicine.....	(1938)		79.3
State University of Iowa College of Medicine.....	(1938)	78,	81.6.
(1939) 77.9, 83.8			
University of Kansas School of			80.6
University of Louisville School			76.6
Louisiana State University School			90.3
Johns Hopkins University School			83
Harvard Medical School.....			80.6
University of Minnesota Medical School.....	(1939)		82.6
Washington Univ. School of Medicine.....	(1938)	77, 82.3,	(1939) 79.2
Creighton University School of Medicine.....	(1938)		75.2,
76, 80.8, (1939) 79.7, 85.1, 85.4			
University of Nebraska College of Medicine.....	(1938)	77.8,	80.9
Albany Medical College.....	(1938)		88.3
Columbia University College of Physicians and Surgeons (1937)			83.1,
(1939) 80.4			
University of Oklahoma School of Medicine (1938)		81.4,	(1939) 79.9
University of Oregon Medical School.....	(1938)		79.2,
81.4, 82.6, 83.4, 86.2, (1939) 83.1			
Jefferson Medical College of Philadelphia.....	(1938)	76.7,	86.9
University of Pennsylvania School of Medicine.....	(1938)		82.4
Marquette University School of Medicine.....	(1939)	79.3,	79.3
University of Wisconsin Medical School.....	(1938)		84
McGill University Faculty of Medicine.....	(1938)		77.4.
78.2, 79.1, 80.6, 85.4, 87			

Medizinische Fakultät der Universität Wien.....	(1924)	80.2
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians and Surgeons of England.....	(1938)	85.2
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1919)	75.7
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen.....	(1923)	88
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main.....	(1922)	86.7
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1926)	84
University of Edinburgh Faculty of Medicine.....	(1925)	84
Second Moscow Medical Institute.....	(1926)	83.3

School	FAILED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939)		74.6
Stanford University School of Medicine.....	(1936)	69.7,	(1939) 70.6
University of California Medical School.....	(1939)		71.2
Rush Medical College.....	(1938)	72.8,	74.1
University of Minnesota Medical School.....	(1939)		74.8
Creighton University School of Medicine.....	(1939)	72.7,	72.8
Marquette University School of Medicine.....	(1938)		71.3
Universität Heidelberg Medizinische Fakultät.....	(1915)		67.4

Ninty-nine physicians were licensed by reciprocity and nineteen physicians were licensed by endorsement from March 24 through September 11. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1925)		Nebraska,
(1938, 2) Arkansas			
College of Medical Evangelists.....	(1934)		Colorado
Stanford University School of Medicine.....	(1929)		Illinois
University of Colorado School of Medicine.....	(1933)		Colorado
George Washington University School of Medicine.....	(1934)		New York
Jefferson Medical College.....	(1911)		Illinois
Northwestern University Medical School.....	(1933)		Illinois
Rush Medical College.....	(1894), (1928)		Illinois, Ohio
University of Illinois College of Medicine.....	(1930), (1935)		Illinois
Indiana University School of Medicine.....	(1926), (1932)		Indiana
State University of Iowa College of Medicine (1924), (1928), (1932), (1933, 2) Iowa			
University of Kansas School of Medicine (1929), (1931), (1936), (1937) Kansas			
University of Louisville School of Medicine.....	(1932)		Missouri
Tulane University of Louisiana School of Medicine (1934), (1937), (1938) Louisiana			
Johns Hopkins University School of Medicine (1931), (1935)			Maryland
Harvard Medical School.....	(1937)		New York
University of Michigan Medical School.....	(1921)		R. Island,
(1928), (1934), (1935) Michigan			
Detroit College of Medicine and Surgery.....	(1929), (1930)		Michigan
University of Minnesota Medical School.....	(1929)		Montana
Barnes Medical College.....	(1907)		Illinois
St. Louis College of Physicians and Surgeons.....	(1914)		Missouri
University Medical College of Kansas City.....	(1908)		Kansas
Washington University School of Medicine.....	(1928)		Illinois,
(1896), (1925), (1936), (1937) Missouri			
Creighton University School of Medicine.....	(1928)		Kansas,
(1926), (1927), (1938, 3) Nebraska			
University of Nebraska College of Medicine.....	(1925)		Arizona,
(1926) Montana, (1925), (1935, 2), (1937), (1938, 2) Nebraska			
Columbia Univ. College of Physicians and Surgeons (1936, 2)			New York
Cornell University Medical College.....	(1926)		New York
Long Island College of Medicine.....	(1926), (1936)		Kentucky
New York Homeopathic Medical College and Flower Hospital.....	(1931), (1935)		New York
New York University College of Medicine.....	(1935)		New York
University and Bellevue Hospital Medical College (1912), (1918), (1921) New York			
University of Rochester School of Medicine.....	(1926)		New York
Eclectic Medical College, Cincinnati.....	(1935)		Ohio
Western Reserve University School of Medicine.....	(1935)		Ohio
University of Oregon Medical School.....	(1919), (1931)		New York,
(1930) Washington, (1931), (1935), (1936, 2) Oregon			
Hahnemann Med. College and Hospital of Philadelphia (1900)			New Jersey
Jefferson Medical College of Philadelphia.....	(1921)		Penna.
University of Pennsylvania School of Medicine.....	(1933)		Penna.,
(1934) Minnesota, (1936) New York			
Western Pennsylvania Medical College.....	(1906)		Penna.
Medical College of the State of South Carolina.....	(1935)		S. Carolina
Meharry Medical College.....	(1927)		N. Carolina
University of Tennessee College of Medicine.....	(1928)		Tennessee
Baylor University College of Medicine.....	(1935)		Texas
University of Texas School of Medicine.....	(1927), (1936)		Texas
Marquette University School of Medicine.....	(1937)		Wisconsin
University of Wisconsin Medical School.....	(1932)		Wisconsin
Trinity Medical College.....	(1896)		Illinois
Universität Zürich Medizinische Fakultät.....	(1926)		New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....	(1930), (1937)		N. B. M. Ex.
University of California Medical School.....	(1937)		N. B. M. Ex.
University of Southern California School of Medicine.....	(1939)		U. S. Navy
University of Colorado School of Medicine.....	(1929)		U. S. Navy
Yale University School of Medicine.....	(1933)		N. B. M. Ex.
George Washington University School of Medicine.....	(1937)		N. B. M. Ex.
Chicago College of Medicine and Surgery.....	(1917)		U. S. Army
Boston University School of Medicine.....	(1932)		N. B. M. Ex.
Harvard Medical School.....	(1934), (1935)		N. B. M. Ex.
University of Michigan Medical School.....	(1917)		U. S. Navy
University of Minnesota Medical School.....	(1938)		U. S. Navy
Washington University School of Medicine.....	(1936)		N. B. M. Ex.
New York Medical College and Flower Hospital.....	(1936)		N. B. M. Ex.
University of Oregon Medical School.....	(1933)		Alaska, N. B. M. Ex.
Vanderbilt University School of Medicine.....	(1931)		U. S. Navy
Medical College of Virginia.....	(1918)		U. S. Navy
University of Wisconsin Medical School.....	(1933)		N. B. M. Ex.

Book Notices

Public Health Law. By James A. Tobey, Dr.P.H., LL.D., Lecturer on Public Health Law at Harvard University School of Public Health, Boston. Second edition. Cloth. Price, \$3.50. Pp. 414. New York: Commonwealth Fund; London: Oxford University Press, 1939.

This edition of Public Health Law is much more comprehensive than the author's earlier volume and has been completely rewritten. The volume is a modern textbook on the important phases of the laws of public health. The publication, therefore, should find importance to those concerned in the various phases of public health and its administration. The text is divided into four major portions, on public health law and administration, the powers and duties of health departments, liability, which includes a thorough discussion of personal liability of health officers, and legislation and law enforcement. Under these four major headings, public health law is discussed in a simple and interesting manner. At the same time there is very little personal opinion of the author. The text is based on facts and references to higher court decisions. Because of the importance of a thorough knowledge of public health law and all its phases to health officers, students of public health, physicians, judges, attorneys, government officials and others, a selected bibliography on public health administration and legal aspects of public health has been gathered by Dr. Tobey. Occasionally public health officials who have been attempting to discharge their duties conscientiously and impartially are distressed to find themselves confronted with indictment or injunction proceedings. Defenses against these legal actions not only are time consuming but may interfere with the proper conduct of official duties and are often unnecessarily expensive. It is highly important, therefore, that health officials discharge their duties with the minimum of litigation either by or against them. Of course there are occasions when court action is necessary as a last resort. For such occasions the wise health official will be amply prepared not only by his conduct but by his familiarity with legal principles applicable to public health. This book may help him attain such familiarity.

The Principles of Dental Medicine: The Medical Aspects of Dental Disease. By F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S., Hon. Dental Physician to the Royal Victoria and West Hants Hospital, London. Third edition. Cloth. Price, \$7.50. Pp. 575, with 44 illustrations. St. Louis: C. V. Mosby Company, 1939.

A fool is bent upon a twig, but wise men dread a bandit.
Which I think must have been clever, for I didn't understand it.

This quotation, taken from the review (*Bristol M.-Chir. J.* 53:114 (summer) 1936) of the Common Cold and Influenza by J. E. R. McDonagh, may with equal aptitude be applied to Broderick's book. The latter has based his text largely on the theories and terminology of McDonagh, both of which are so unusual that the reader has to acquire not only new definitions for words commonly used by physicians, physiologists and biochemists but also an entirely new theory for the mechanism of disease. No doubt most of those who read it will label it "clever," though probably because they don't "understand it." The arrangement is faulty, there is a great deal of repetition, and quotations from other authors are overnumerous and many inept. McDonagh and Broderick's notions are summed up in the latter's statement "Disease being, as we have seen, primarily the consequence of the condensation of one protein particle by another, in the process of which the less condensed is robbed of electrons by the more condensed, it depends essentially on the existence of a state of colloidal disequilibrium." Dental caries, Broderick believes, is due to pure dehydration (acidosis, agglutination) of the colloidal protein particles of the blood plasma and pyorrhea to pure hydration (alkalosis, dispersion). It should be noted that he uses such terms as hydration and dispersion in special senses quite different from conventional practice. Gingivitis is the result of colloidal disequilibrium between dehydration and hydration and a connecting link between pyorrhea and caries. The extreme degree to which such ideas have been carried by him is illustrated by the following: "Another factor which needs mention is that of masturbation, a circumstance which may definitely play a part in the production of dental caries through metabolic upset in the direction of an acidosis." The book is divided into three parts: part I, general physiologic

considerations, treats of such subjects as acid-base balance, vegetative nervous system, endocrine system, colloidal state, calcium metabolism, saliva, nature and cause of disease; part II, dental medicine, including etiology and prevention of caries and pyorrhea, action of drugs, aim of medical treatment, experimental methods; part III, relation of dental to general medicine, covering effect of civilization, effect of dental sepsis, teeth in arthritis, allergic disease, tuberculosis, malignant disease, diabetes and pregnancy. The formal text is concluded by the introduction of twenty-five case histories illustrating the author's methods of diagnosis and treatment.

Le cancer de l'estomac au début: Étude clinique, radiologique et anatomo-pathologique. Par René-A. Gutmann, médecin des hôpitaux de Paris, Ivan Bertrand, directeur à l'École des Hautes Études, et Th. J. Péristhany, assistant à la consultation de gastro-entérologie de la Salpêtrière. Préface du Dr A. Gosset. Cloth. Price, 360 francs. Pp. 493, with 563 illustrations. Paris: G. Dolin & Cie, 1939.

There is an introduction by Prof. Antonin Gosset. This publication is the only one of its kind dealing exclusively and extensively with gastric cancer in its earliest stages. The appearance of such a work is extremely welcome not only because of the importance of the subject matter but because of the enviable reputation of the senior author, an experienced and skilful gastro-enterologist. For serious students of the clinical and radiologic aspects of gastric disease an English translation is highly desirable. The subject matter is arranged in the following order: clinical 111 pages, radiologic 170 pages, methods of laboratory examination thirty pages, treatment ten pages, and gross and microscopic pathology 150 pages.

Gutmann and his collaborators emphasize the important fact that any gastric disorder of recent onset which is of a persistent nature and recurs should be considered as serious until proved otherwise. They describe three clinical types of gastric carcinoma: latent, painless and painful. Clinicians will heartily approve the strong emphasis placed on the observation that the symptoms and signs of early carcinoma are often lacking, trivial or distorted. Included in the first type are patients with a symptomless epigastric tumor or with such initial symptoms as edema or those engendered by metastases. The second type may be characterized by nothing but a vague indigestion, which may at the outset be temporarily relieved by treatment, or by such symptoms as anorexia, nausea, vomiting, dysphagia, acrochagia, hemorrhage, hunger pain, constipation, diarrhea, fever or loss of weight or strength, any one of which, or a combination of which, may be the initial and exclusive complaint. The painful form has its origin in ulcer-like cancer (le cancer ulcéreux), cancer on ulcer (l'ulcère transformé) and a third form designated le cancer gastrique muco-érosif à marche lente. This is a rare superficial variety with ulcer-like symptoms of long duration, not of progressive severity, which may remain localized to the mucosa for a long period. The aforementioned three types are illustrated by short case histories.

The authors have also had the experience that malignant ulcers may appear to heal, or be temporarily healed, under medical treatment. To show how frequently one sees early ulcer-like lesions, Gutmann and his co-workers (page 52) state that during the last 300 gastrectomies performed in their clinic there were removed eighty-five ordinary vegetative cancers, 133 benign ulcers, forty-three ulcers which had apparently begun benignly and then later became malignant, and thirty-nine ulcer-like cancers.

From a roentgenologic standpoint early gastric cancer consists of three general forms: infiltrating, ulcerating and tumefactive (formes végétantes). The former is characterized by the presence of localized regions of rigidity, by cone shaped or pencil point defects of the pylorus, by "aspect encastré" or by undulating or lacunar forms of filling defects. The ulcerating form is characterized in order of importance by the niche en plateau, an elevated defect in contrast to the depressed or dish-like image encastrée, by the large triangular niche, by the niche encastrée, and by the meniscus sign (la niche à ménisque). Contrary to what is generally believed, the authors think that the last mentioned sign is not pathognomonic for cancer and that it should be interpreted with caution because, in their opinion, this sign may be produced by periulcerous inflammatory changes. One procedure which appears logical to the clinician, and which should be employed more often by the radiologist, is the routine

treatment of these patients for from four to six weeks and reexamination thereafter. The effect of such treatment often appears decisive in arriving at a final diagnosis in these early lesions.

In the authors' opinion it is not possible to make a diagnosis of incipient carcinoma by the gastroscope; gastric analysis is of no help in the diagnosis of early cancer; though decidedly inferior to roentgenologic examination, the systematic examination of the feces for occult blood is more important than the other methods; serologic and cytologic studies are of no value in the diagnosis of early cancer; the classic chronic gastritis is not considered the precursor of cancer, although there may be a gastritic stage of incipient cancer; there appears to be no justification for gastric resection for gastritis in order to avoid gastric cancer.

The section on gross and microscopic anatomy of the disease is highly instructive and convincing, and the illustrations are numerous, ample and clear. As a matter of fact, the illustrations throughout the book are all that one could desire.

To many roentgenologists the section on roentgenologic diagnosis may prove disappointing, chiefly because the value of roentgenoscopy, study of the mucosal relief and the significance of the meniscus sign are belittled. On the contrary, a study of the barium-filled stomach is extolled. Granting that the authors' method of examination and interpretation may result in early diagnosis of early cancer in a large proportion of cases, many able roentgenologists maintain that roentgenoscopy will reveal early gastric cancer with a high degree of accuracy, that inspection of the internal relief is highly informative and frequently indispensable, and that the meniscus complex, properly determined, is consistently indicative of ulcerating carcinoma. Apparently the authors are not familiar with, or they do not endorse, the quick staining method of frozen sections, which was developed in this country. Their attitude on gastritis as a precursor to cancer, and on gastroscopic diagnosis, will undoubtedly be challenged in many quarters. Only a few of the important American contributions to the subject of gastric cancer masquerading as benign gastric ulcer are cited.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie. Par MM. P. Baillart, Ch. Coutela, E. Redslob, E. Yelter. René Onfray: Secrétaire général. Tome IV: Pathologie (suite). Par MM. A. Cuénod et al. Cloth. Price, 400 francs. Pp. 890, with illustrations. Paris: Masson & Cie, 1939.

The fourth volume of this new French encyclopedia follows the general form of its predecessors and is given over to the pathologic conditions of the anterior portions of the eye. The text consists of the pathology of the lacrimal apparatus by Vallière-Vialeix of Limoges, diseases of the conjunctiva by Renard of Paris and Nataf of Tunis, trachoma by Cuénod and Nataf of Tunis, conjunctival lesions resulting from systemic disorders and exanthems by Genet of Lyons, conjunctival lesions produced by chemical substances or by products of animal or vegetable origin by Genet, conjunctival lesions produced by physical agents by Genet, new formations and tumors of the conjunctiva by Merigot de Trigny of Paris, diseases of the cornea by Prêlat of Paris, diverse disorders of the cornea by Kleefeld of Brussels, and diseases of the sclera by Petit of Paris. Naturally with such a variety of authors there is a wide variation in the character of the individual chapters. The first 300 pages of the book is devoted to diseases of the entire lacrimal apparatus and nowhere in the literature is there such a careful systematic compilation as this. That chapter is profusely illustrated by reproductions of photographs, mostly black and white. The pictures of the external face are good, the reproductions of roentgenograms of the tear passages are rather indifferent, and the photomicrographs of the pathologic changes are excellent. The remainder of the book is extensively illustrated with color plates, some reproductions of drawings and some color photographs. On the whole these are excellent, particularly those showing biomicroscopic aspects. Unfortunately, the chapter dealing with the cornea contains comparatively few and rather indifferent illustrations. Particularly appropriate at this time is an eight page section that starts with the following short paragraph: "The appearance of the ocular manifestations due to yperite date from the end of July 1917. At that period the British front in the Ypres-

sector was subjected to a bombardment by poisonous substances which were up to that time unknown and which produced the ocular disturbances that we are about to describe. Hence the name 'yperite.'" Then follows a careful description of the inflammation of the eyes caused by yperite, or mustard gas, together with treatment and prognosis. To the American ophthalmologists who were not at the front, this condition is practically unknown. By and large, volume iv is up to the standard set for the entire encyclopedia. In some ways, particularly color reproductions, it surpasses its predecessors, while in some chapters the text matter is not as complete as could be wished for in a work of this extent. However, it is so good that it is to be devoutly hoped that the war will not interfere with the completion of the series.

Medical Climatology: Climatic and Weather Influences in Health and Disease. By Clarence A. Mills, Ph.D., M.D., Professor of Experimental Medicine, University of Cincinnati, Cincinnati. Cloth. Price, \$4.50. Pp. 296, with 90 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

Chapter I opens by differentiating sharply between weather and climate. By weather in a meteorologic sense is meant the sum total of atmospheric conditions prevailing from hour to hour and from day to day or week to week. Climate, however, refers to average conditions over many years or decades and while more stable than weather should not be thought of as a fixed term to cover unchanging values. This book deals definitely with variations in climate; i. e., different climatic areas rather than with weather as defined. Climate, Mills says, plays a distinct part in average body heat loss and energy output, therefore exerting a preponderant role in the existence of man and other warm blooded animals. There is a climatic dominance of growth, fertility, metabolism, body resistance, vascular system and other human functions. Mills has not attempted in this book to cite the mass of evidence for the role of climate in so many functions and human diseases. In spite of the author's statement in the preface that he does not desire to hold climate and weather responsible for all human reactions, the reading of the book demands the constant exercise of the critical faculties to avoid this conclusion. Pitfalls are numerous and many readers will have difficulty in grasping such statements as this made on page 184: "World leaders listed in Who's Who and other similar volumes, and the presidents of the United States, have largely been born in the more stimulating and unstable first half of each year. The feeble-minded, on the other hand, are more often conceived in summer or early fall, when fewer superior minded individuals are being conceived. And in the matter of admission to mental hospitals, this same relationship to seasonal stress is found." Many statements perhaps equally difficult to confirm are made in other portions of the book but may not be quite so obvious.

Opuscula selecta Neerlandicorum de arte medica. Fasciculus quintus-declmus quem curatores miscellaneorum quae vocantur Nederlandsch Tijdschrift voor Geneeskunde collegerunt et ediderunt Amstelodami Sumptibus Societatis. Petri Camperi itinera in Angliam 1748-1785. [Selected Dutch Writings on Medical Art. No. 15. Travels of Petrus Camper in England 1748-1785.] Cloth. Pp. 264, with illustrations. Amsterdam, [n. d.].

This volume of the remarkable series issued by the *Nederlandsch tijdschrift voor geneeskunde* contains the diaries of Petrus Camper, "the most famous Dutch doctor of the second half of the eighteenth century," during his visits to England in 1748-1749, 1752 and again in 1785. B. W. T. Nuyens writes an interesting introduction and critical review of the diaries. The diaries are in the Dutch language, with translation into English on the opposite pages. The diary of the first visit to London is accompanied by "annotations to a course of lectures on midwifery delivered by the wellknown Doctor W. Smellie" in Latin with English translation and illustrated by facsimile reproductions of the title page of the summary of Smellie's course and of the first two pages of Camper's annotations. The diaries record in detail Camper's daily experiences during his English visits. "When in 1748 as a young doctor, in 1752 as a youthful professor at Franeker's university, he [Camper] went to England he did this to improve his skill in the medical science, preferably in midwifery. When, thirty-seven years later, in 1785 he revisited England, he went as a scientific man of mature experience, to communicate to his English colleagues his

self-assured ideas on obstetrics, the fruits of . . . a long practice." During his second visit William Hunter invited him to dinner, of which he writes: "Had dinner at Hunter's on Wednesday (19th July) and saw his drawings of the uterus gravidus, which were very finely drawn by Rymsdyk." There are seventeen illustrations which show portraits of Camper, several drawings by him, and also a portrait of Smellie by himself. At the end are biographic notes of persons mentioned in the diaries. Readers of medical history, and especially those concerned with obstetric history, will find this book of exceptional interest.

Traffic in Opium and Other Dangerous Drugs for the Year Ended December 31, 1938. Report by the Government of the United States of America. U. S. Treasury Department, Bureau of Narcotics. Cloth. Price, 20 cents. Pp. 122, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This report by the Commissioner of Narcotics to the Secretary of the Treasury deals with the calendar year ended Dec. 31, 1938. It indicates that there are still seven states which have not passed the uniform narcotic drug act; namely, Kansas, Maine, Massachusetts, New Hampshire, Washington, North Dakota and Vermont. The control of drug addiction in the United States continues to be satisfactory. Apparently the number of drug addicts has decreased from ten per 10,000 persons in 1924 to two per 10,000 persons at the present time. The treatment used in the government hospitals includes withdrawal of the drugs within fourteen days, warm baths, sedatives when necessary, and supplementary measures as indicated. A recent survey indicates that three years after the date of discharge 34 per cent have not relapsed. Research is being conducted as to non-habit forming drugs which may be used to replace opium. Studies are also being made on narcotic addiction and crime. In the section of the book devoted to traffic in opium there are some interesting stories dealing with illicit traffic in narcotic drugs, each of them dramatic and each of them indicating the difficulty in controlling illicit traffic in opium. The records fortunately report but few instances in which physicians have been conspicuously mixed with this traffic. The per capita consumption of opium in the form of all its salts, derivatives and preparations amounted to approximately 7.4 grains for 1938. The per capita consumption of cocaine alkaloid was approximately 0.09 grain.

The History of the Forceps: An Investigation on the Occurrence, Evolution and Use of the Forceps from Prehistoric Times to the Present Day. By Vilhelm Mjller-Christensen. (With a Summary in Danish). Denne Afhandling er af det lægervidenskabelige Fakultet antaget for den medicinske Doktorgrad, København. Translated from the Danish by W. E. Calvert. Paper. Pp. 298, with 441 illustrations. Copenhagen: Levin & Munksgaard; London: Oxford University Press, 1938.

In 1931 the author devised a three legged suture forceps and before publishing a description of it he reviewed various German, British and French instrument catalogues to make certain that his invention was original. He was amazed to find that in one catalogue (Jetter and Scherer's Aesculap Musterbuch) there were more than a thousand different forceps. Of course, many of the models differed only slightly but there were at least 200 different types. The author then undertook to study the sources from which this "world of forceps" arose. For this purpose he reviewed not only medico-historical but also archeological literature. Furthermore, he visited many museums both in his native country (Denmark) and abroad (Sweden, France, Italy, Great Britain and Germany). Illustrations were made of a large number of different types of forceps and in this book the author has included 441 of them. The author defines forceps as a gripping instrument which consists of two legs joined together in a hoop, or forged solidly together or emanating from a solid metal rod and terminating at the other end in the gripping parts, the jaws. The author points out that the original model of the forceps was the hand, when its thumb and index finger are used for gripping. When the hand, used as a forceps, grips coarse objects the finger pulpa act as the jaws, whereas when gripping finer objects it is the nails that act as the forceps jaws. The book is extremely interesting and abundantly illustrated. It represents an enormous amount of hard work and considerable travel, and the author is to be congratulated on his accomplishment.

Diseases of the Mouth and Their Treatment: A Text-Book for Practitioners and Students of Medicine and Dentistry. By Hermann Fridz, A.M., D.D.S., M.D., and Sigmund S. Greenbaum, B.S., M.D., F.A.C.P., Professor of Clinical Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Second edition. Cloth. Price, \$9. Pp. 670, with 336 illustrations. Philadelphia: Lea & Febiger, 1939.

This is a collection and evaluation of important contributions concerning the diseases of the mouth and their treatment, the second edition of a work designed as a textbook for students and practitioners of medicine and dentistry. In this edition the book has been thoroughly revised and a new chapter on lymphadenitis has been added together with articles on Paget's disease (ostitis deformans), Schüller-Christian disease, hereditary pseudohemophilia, sarcoidosis and many other conditions productive of mouth lesions. In addition there are articles on microscopic technic, roentgenographic examination, mouth breathing, harelip and cleft palate, and diseases of the mouth associated with nervous disorders. There is also a complete classification of tumors of the mouth. Seventy-five illustrations have been added and many of the older ones have been replaced. Since this book is intended as a textbook rather than a reference work, some of the subjects of lesser importance are given only a little space. Those of importance are handled adequately. Nothing of importance has been omitted, and though the book is of only medium size it is an adequate discussion of the common diseases of the mouth and of every disease productive of mouth lesions. The text is well written, the illustrations are for the most part excellent. The type is large and legible. It should satisfy a need long felt by dermatologists, oral surgeons and the general practitioner.

Die Pflege des gesunden und kranken Kindes: Zugleich ein Lehrbuch der Ausbildung zur Säuglingspflegerin und Kinderkrankenschwester. Unter Mitarbeit von R. Bittner et al. Herausgegeben von Prof. Dr. med. Werner Cattel, Direktor der Universitäts-Kinderklinik und -Poliklinik, Leipzig. Paper. Price, 18 marks. Pp. 764, with 423 illustrations. Leipzig: Georg Thieme, 1939.

This is the longest textbook for nurses and nursemaids that has ever been written. One wonders whether a volume of 764, large pages will ever be read by nurses or nursemaids. The section on anatomy and physiology is excellent and would do justice to a special treatise on the anatomy and physiology of childhood. The rest of the book is well written but not as well as the first section. The book is all inclusive. It not only covers the ordinary care of the healthy and the sick child but it includes also a section on public health, child education and psychology, child play, and a section on the health of the mother. Significant of the present day political trend is the inclusion of a section on race theory. The content in this section, however, is mainly biologic. Significant also is an illustration in the chapter on play showing miniature soldiers and cannons as toys for children. The illustrations in the section on anatomy are excellent. Most of the illustrations in the other chapters are too small and some of them are indistinct.

Pathologie chirurgicale de la rate. Par Pierre Golnard, chirurgien des hôpitaux d'Alger. Paper. Price, 55 francs. Pp. 174, with 15 illustrations. Paris: Masson & Cie, 1939.

This monograph is the sixth in a series concerned with various diagnostic procedures and pathologic conditions of the spleen. The present volume, although dedicated to the surgical pathology of the spleen, covers a much wider field and considers in some detail almost all the important disease conditions which may affect that organ. The author particularly emphasizes the necessity for the clinician and surgeon to cooperate closely before surgical intervention is recommended. Ptosis of the spleen and torsion of the splenic pedicle, contusions and ruptures, as well as wounds and herniation of the spleen, are carefully considered and in most cases splenectomy rather than some other conservative operation is indicated. Splenomegaly due to various types of infections receives detailed mention, the chapter on hydatid cysts of the spleen being particularly valuable. The last half of the monograph is devoted to a consideration of the splenomegalies associated with pathologic blood conditions, changes in the liver and gastrointestinal hemorrhages, with a further chapter on Gaucher's and the Pick-Niemann disease. The author concludes that splenectomies are particularly valuable in hemolytic icterus and

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Life Insurance: "Sound Health" and "Serious Disease or Complaint" Construed.—The defendant insurance company issued two life insurance policies which provided "If, . . . the insured . . . is not in sound health on the date hereof . . . or has, within two years before the date hereof, been attended by a physician for any serious disease or complaint . . . the Company may declare this policy void." On the death of the insured the defendant insurance company refused to pay the benefits stated in the policies, alleging that within the two years preceding the issuance of the policies the insured had been attended by a physician for high blood pressure, which the company claimed was a "serious disease or complaint." The plaintiff, the administratrix of the insured's estate, then brought suit. The trial court rendered judgment in favor of the plaintiff, but on appeal to the supreme court of New York, appellate division, fourth department, 252 App. Div. 926, 300 N. Y. S. 182, this judgment was reversed and the complaint dismissed. From the latter judgment the plaintiff appealed to the Court of Appeals of New York.

The evidence showed that the insured had suffered from high blood pressure, accompanied by dizzy spells, prior to her application for insurance, but there was also evidence that the insurer's agent knew of the insured's condition. A physician who attended her four months prior to the issuance of the policies testified that at intermittent periods she had a systolic blood pressure of between 190 and 200, but he did not testify either that she was suffering from a serious disease or complaint or that she was not in sound health. The evidence showed, too, that the insured, when she applied for insurance, was able to do her own housework and that the insurer's physician who examined her before the policies were issued reported that she was in good health.

Evidence could not properly be admitted, said the Court of Appeals, to show that the insured falsely stated in her application that she had not been under the care of a physician for three years, although in fact she had been attended by a physician within two years. Section 58 of the Insurance Law of New York requires that an insurance policy contain the entire contract and provides that nothing can be incorporated therein by reference. Consequently false statements, oral or written, made to induce an insurance company to issue a policy of insurance, even though they are material, do not constitute a defense unless they are attached to or endorsed on the policy. In the present case, the applications for insurance were neither attached to nor endorsed on those policies and so the statements in the applications were not warranties.

The burden of proof, said the Court of Appeals, rested on the insurer to justify its voiding its policies. It had to establish either that the insured had been attended by a physician for a serious disease or complaint within two years of the issuance of the policies or that she was not in sound health at the time the policies were issued. What constitutes a serious disease or sound health is ordinarily a matter of opinion. A condition which in one person might constitute a serious disease or complaint in another person might not be considered serious. The defendant, in the opinion of the court, failed to establish as a matter of law that the insured was not in sound health at the time the policies were issued or that she was suffering from a "serious disease or complaint."

There was evidence from which, the court thought, the jury could have found that the insurer's agent knew of the condition of the health of the insured. The court, however, was not in sympathy with the insurer's contention that because the agent had no authority to change the conditions of the policies the doctrine of equitable estoppel should not apply against it. Knowledge of the agent constituted knowledge on the part of the insurer. It would be a fraud on the policyholder to permit an insurer to accept premiums on a policy which it knew was void from its inception. Neither did the court look with favor

on the insurer's contention that because the insured had not disclosed to the insurer's medical examiner the information that she had previously given to the insurer's agent, the insured should not be estopped. The insured might well have believed that the medical examination had been required because of the information which she had given to the agent. Moreover, if the jury found, as apparently it did, that the insurer had not proved that the insured was not in sound health or had been attended by a physician within two years before the issuance of the policies for any "serious disease or complaint," the question of waiver or estoppel would be unimportant, and the trial court correctly so instructed.

The Court of Appeals ordered the judgment of the supreme court, appellate division, reversed and the judgment of the trial court in favor of the plaintiff affirmed.—*Lampke v. Metropolitan Life Ins. Co. (N. Y.), 18 N. E. (2d) 14.*

Basic Science Acts: Application for Exemption Tardily Filed.—The basic science act of Oklahoma, which became effective April 19, 1937, exempted from its requirements "Indian Herb Doctors, Herb Doctors or Doctors who administer simple remedies who register with this board [the basic science board] within sixty (60) days after the passage of this Act and who have practiced in Oklahoma for two (2) years." On June 18, 1937, the last day on which registration under the foregoing provision could be made, the defendant Adamson deposited in the United States mail at Oklahoma City an application, addressed to the secretary of the basic science examining board of Oklahoma, for exemption as a doctor who administered simple remedies. This letter was delivered June 21, 1937, or sixty-three days after the basic science act became effective. The board denied the application and Adamson instituted mandamus proceedings to compel the board to register him. The trial court granted the writ of mandamus on the theory, apparently, that the act of mailing the application was synonymous with the act of registering as required by the basic science act. The board thereupon appealed to the Supreme Court of Oklahoma.

In reversing the judgment of the trial court and remanding the cause, the Supreme Court said that where a person is required to register with a certain board within sixty days of a certain date in order to acquire a privilege under the law and he deposits his application in the United States mail on the sixtieth day, addressed to the secretary of the board more than 100 miles away, such act of mailing is not equivalent to registering, and if the application so mailed is not delivered until the sixty-third day it is too late. When a person elects to mail an application for registration, he thereby selects the United States mail as his agency, and the risk of delay in delivering is on him. The general rule, the court pointed out, is thus stated in 46 C. J. 559, sec. 69:

In the absence of custom, statute, estoppel, or express contract stipulation, when a notice, affecting a right is sought to be served by mail, the service is not affected until the notice comes into the hands of the one to be served.

—*George et al. v. Adamson (Okla.), 86 P. (2d) 980.*

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otolological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Western Section, American Laryngological, Rhinological and Otolological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 105-140 (Oct.) 1939

Changing Concepts of Infectious Diseases. V. P. Sydenhaster,

Augusta, Ga.—p. 105.

Use of Vitamins in Eye, Ear, Nose and Throat Practice. R. M.

Clements and H. B. Searcy, Tuscaloosa.—p. 109.

Pelvic Ulcer: Modern Conception of Surgical Treatment. M. Skinner,

Selma.—p. 113.

Empyema Thoracis: Review of Progress in Treatment. J. M. Mason,

Birmingham.—p. 116.

Obstetrics in Relation to Maternal Morbidity. J. Watson, Anniston.—

p. 120.

American J. Digestive Diseases, Huntington, Ind.

6: 505-588 (Oct.) 1939

Clinical Significance of Carrier State in Amebiasis. J. T. Howard,

Baltimore.—p. 506.

Perforation of Colon Complicating Bacillary Dysentery. D. N. Silver-

man, New Orleans.—p. 509.

Value of Peritoneoscopy in Gastro-Enterology: Review of 100 Cases.

E. B. Benedict, Boston.—p. 512.

Discussion of Procedures Which Are Helpful in Diagnosing Lesions of

Esophagus. H. E. Wright, Baltimore.—p. 519.

Gastric Stimulating Tumor Formation. R. Schindler, Chicago.—p. 523.

Improved Gastric Test-Meal. C. M. Wilhelm and A. Sachs, Omaha.—

p. 529.

Absorption and Dilution of Glucose Solutions in Human Stomach and

Duodenum. H. Shay, J. Gershon-Cohen, S. S. Reis and E. L. Munro,

with technical assistance of H. Siple, Philadelphia.—p. 535.

Test for Intestinal Absorption. T. L. Albansen, San Francisco.—p. 544.

Experimental Study of Effect of Thyroid on Motility of Gastrointestinal

Tract. S. Morrison and M. Feldman, Baltimore.—p. 549.

Carrier State in Amebiasis.—Howard discusses the clinical

state of twenty-two carriers of *Endamoeba histolytica*. These

patients had abdominal complaints other than frank diarrhea or

dysentery; they had no other intra-abdominal or extra-abdominal

disorder. The symptoms in all were severe enough to make

the patients consult their physicians or to make them go to a

hospital dispensary. They were given routine gastrointestinal

examinations, a complete physical examination, blood count,

serologic test for syphilis, gastric analysis after an Ewald test

meal, fluoroscopic examination after the administration of barium

sulfate and proctoscopic examinations and stool studies. The

preliminary diagnoses varied. The most common symptoms

were pain, nervousness, gas with the passage of flatus, mucus

in the stool, alternating constipation and diarrhea, and, uncommon

stools or slight diarrhea. Each of the patients was given ame-

bicidal therapy (emetin, carbarsone and/or chiniofon). Two

and normal 1 to 1 responses was established. The results demon-

strated that digitalis in doses sufficient to induce therapeutic

effects may be given in cases of partial heart block without

causing interference with the orderly passage of impulses from

the auricles to the ventricles. While digitalis and organic heart

disease interfere with auriculoventricular conduction, these fac-

tors do not interfere each other and their simultaneous presence

does not lead to an additive effect when such doses as used in

the present study are utilized. Although digitalis in doses of

from 0.1 to 0.23 Gm. to 10 pounds (4.5 Kg.) of body weight

did not greatly increase preexisting heart block in any case of

this series, it is impossible to preclude the possibility that occa-

sional or rare instances may be encountered in which this may

occur, particularly if dosages approaching toxic amounts are

employed. Therefore the authors warn that caution and careful

observation should be exercised, particularly if larger doses than

those employed by them are utilized.

Pregnancy and Diabetes.—From a study of the records of

353 pregnancies in 242 diabetic women cared for since 1898,

White and her associates find that, excluding surgically inter-

American Journal of Medical Sciences, Philadelphia

198: 445-588 (Oct.) 1939

Islet Cell Tumors of Pancreas. W. R. Campbell, R. R. Graham and

W. L. Robinson, Toronto.—p. 445.

*Should Digitalis Be Administered to Patients with Preexisting Partial

Heart Block? H. L. Blumgart and M. D. Altschuler, Boston.—p. 455.

Experimental Arthritis in Rabbits Produced with Streptococci and Other

Organisms. R. L. Cecil, D. M. Angervine and S. Rothbard, New

York.—p. 463.

Clinical Experience with Globin Insulin. L. Baumann, New York.—p. 475.

*Prediction and Prevention of Late Pregnancy Accidents in Diabetes.

Priscilla White, R. S. Titus, E. P. Joslin and Hazel Hunt, Boston.

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*Erythrocytosis Following Bleeding Peptic Ulcer. R. H. Lyons and C.

Bremner, Boston.—p. 492.

*Cystine Hydrochloride as Anticoagulant for Clinical Use. T. J. Putnam

and P. A. Hoefler, Boston.—p. 502.

Study of Clotting Defect in Hemophilia: Delayed Formation of Throm-

bin. K. M. Brinkhaus, Iowa City.—p. 509.

Blood Studies in Lymphogranuloma Venereum, with Special Reference

to Serum Proteins. R. H. Kampmeier, D. W. Smith and R. M.

Larsen, Nashville, Tenn.—p. 516.

Studies on Physiochemical Index: III. Evaluation of Alcohol with Refer-

ence to Depressed Psychotic Patients. J. M. Looney, W. Freeman and

Rose R. Small, Worcester, Mass.—p. 528.

Electrocardiogram During Insulin Shock Treatment of Schizophrenia and

Other Psychoses. S. Bellet, H. Freed and W. W. Dyer, Philadelphia.

—p. 533.

Fecal Impaction. R. W. Benson and J. A. Barger, Rochester, Minn.—

p. 541.

Origin of Ammonia in Urine Under Normal Circumstances and in Kid-

ney Disease. M. Friedlander, New York.—p. 546.

Chromium Poisoning in Infancy. J. P. Sander, Lansing, Mich., and

C. D. Camp, Ann Arbor, Mich.—p. 551.

Digitalis and Partial Heart Block.—Because of conflict-

ing opinions as to whether digitalis should be given to patients

with partial heart block, Blumgart and Altschuler observed its

effect on nineteen patients from 15 to 72 years of age with

congestive heart failure. Digitalis was administered in doses

calculated on the basis of body weight, somewhat less than the

full Egleston dosage was administered. Digitalization was

accomplished within three to nine days. Nausea was induced in

six cases and in these no significant change in PR interval

occurred. In two of these cases, changing 2 to 1 and 1 to 1

responses were present before and after digitalization. Of the

nineteen cases studied, the PR interval did not change in eleven,

in three a lengthening of 0.02 second and in three a lengthening

of 0.04 second occurred, in one the PR interval was shortened

by 0.04 second and in another the PR interval was shortened

by 0.08 second. No alteration in the orderly sequence of auricu-

lar and ventricular contractions occurred except that observed

in one case in which occasional 2 to 1 heart block disappeared

and normal 1 to 1 responses was established. The results demon-

strated that digitalis in doses sufficient to induce therapeutic

effects may be given in cases of partial heart block without

causing interference with the orderly passage of impulses from

the auricles to the ventricles. While digitalis and organic heart

disease interfere with auriculoventricular conduction, these fac-

tors do not interfere each other and their simultaneous presence

does not lead to an additive effect when such doses as used in

the present study are utilized. Although digitalis in doses of

from 0.1 to 0.23 Gm. to 10 pounds (4.5 Kg.) of body weight

did not greatly increase preexisting heart block in any case of

this series, it is impossible to preclude the possibility that occa-

sional or rare instances may be encountered in which this may

occur, particularly if dosages approaching toxic amounts are

employed. Therefore the authors warn that caution and careful

observation should be exercised, particularly if larger doses than

rupted pregnancies, the fetal mortality in the preinsulin era was 44 per cent and in the insulin era 38 per cent. In the preinsulin era, early and late fetal deaths occurred with equal frequency. In the insulin era, 60 per cent of the fetal deaths were late because of stillbirth or neonatal accidents and 40 per cent because of spontaneous abortions. The authors believe that severe diabetic crises—coma and hypoglycemia—are not at all incompatible with the birth of a living child. Thus among fourteen accidents in late pregnancy maternal coma occurred only twice, in each instance precipitated by infection, and the remaining twelve patients had no signs of acidosis. The latter had taken meticulous care of their diabetes to ensure the birth of a living child. In contrast to this experience, other patients careless of the diabetic routine have had a successful outcome of the pregnancy. It became evident to the authors that stillbirth was not related to diabetes or its specific complication (coma) but was definitely related to preeclamptic toxemia and as time elapsed that the accidents—neonatal death and premature delivery—were also related to the abnormal hormone picture. The relationship of toxemia and stillbirth first became apparent to them when they observed that in many diabetic women the course of pregnancy was uneventful until the sixth month, when at any time thereafter edema, albuminuria and a rising blood pressure developed in the patient. Shortly after the rise of the blood pressure the fetus died and the signs of toxemia promptly disappeared. The entire clinical picture can occur and disappear in as short a time as one week, but it is predicted from four to six weeks by the rise of gonadotropic substance in the serum. Of thirty-five completed pregnancies studied for determinations of gonadotropic substance in the serum, nine were of former juveniles—patients with onset of diabetes before 15 years of age. In only one case did the onset of diabetes occur during pregnancy, and insulin was required in only one. Diabetes was severe or moderately severe in twenty-six. Coma developed in one case and hypoglycemia for three days in one, following the mistaken administration of 276 units of protamine zinc insulin. In general, the control of diabetes was good in all cases. The clinical course in the fourteen cases in which the values for serum gonadotropic substance were repeatedly normal was completely uneventful. Complications developed in the ten cases in which the values for serum gonadotropic substance were supernormal and no treatment was given. Toxemia developed in seven. Premature delivery occurred in the remaining three. In two successive pregnancies in the same case in which values for gonadotropic substance were supernormal but steadily fell the fall was preceded by a rise of estrogen four weeks prior to the normally expected time. During the first pregnancy well marked signs of toxemia developed. These decreased in severity with the fall of gonadotropic substance. Less well defined signs in the second pregnancy disappeared entirely. The biochemical behavior in this case gave further presumptive evidence of the probable value of estrogen therapy. Massive doses of estrogen were administered in nine cases in which the values for serum gonadotropic substance were supernormal, from 150,000 to 300,000 international units as progynon B being given and in addition progestin. Replacement treatment was followed by a drop in serum gonadotropic substance controlled by the size and frequency of the dose of estrogen. No instance of progressive toxemia occurred. Not one woman miscarried. There was a tendency for the serum protein which fell to low levels to rise without change in diet, the weight to fall, the urinary output to be increased, the albumin to be diminished and the blood pressure to fall. Therefore it seems that the test for gonadotropic substance permits one to classify the cases according to hazard and to gauge the effect of therapy.

Erythropoiesis Following Bleeding Peptic Ulcer.—Lyons and Brenner evaluate, in 237 admissions of bleeding peptic ulcer, the problems presented by the anemia that follows hemorrhage. Special attention has been given to the symptoms resulting from the hemorrhage and the rate of recovery of the erythrocytes after the hemorrhagic episode. In all these cases there was either x-ray or postmortem evidence of peptic ulcer or a clinical diagnosis of a peptic ulcer based on typical symptoms

of long duration or a definite history of melena or hematemesis either within a month before entry or during hospitalization. The authors found that the greater the anemia the greater was the average daily increment of erythrocytes. From average weekly erythrocyte counts it is seen that the erythropoietic response of the body is determined by the degree of the anemia at the moment and is independent of the initial severity of the hemorrhage itself. The observed erythropoietic rate for cases in this series, in the large majority of which a Sippy regimen was prescribed, was fully as good as that reported for cases in which a liberal "puréed diet" and iron were employed. Beyond the actual increment of donated cells, transfusion appears to have no effect on the rate of erythropoiesis. The net mortality for the series was 5.5 per cent. This appeared to be independent of sex or number of previous hemorrhages.

Cystine Hydrochloride as Anticoagulant.—Putnam and Hoefler state that the intracardial injection of cystine hydrochloride into dogs was followed by a rise in coagulation time of from 40 to 100 per cent in three of five experiments. The administration of cystine hydrochloride to dogs by stomach tube was followed by an increase of clotting time of from 25 to 100 per cent in all technically satisfactory experiments. Cystine hydrochloride also was administered by mouth in twenty-three cases in which the diagnosis of multiple sclerosis had been made. In seventeen a rise of coagulation time was observed, which varied from 30 to 90 per cent. Cystine hydrochloride is well tolerated by most patients in daily doses up to 3 Gm., over many months. No serious symptoms have been observed to follow its use. It is therefore suggested as an anticoagulant of rather low efficiency for use over long periods for conditions in which such an agent might be valuable.

American Journal of Ophthalmology, St. Louis

22: 1071-1200 (Oct.) 1939

- Ocular Shwartzman Phenomenon. T. E. Sanders, St. Louis.—p. 1071.
Studies on Surface Epithelium Invasion of Anterior Segment of Eye. T. L. Terry, J. F. Chisholm Jr., Boston, and A. L. Schonberg, Cleveland.—p. 1083.
Study of Methemoglobin Producing Organisms in Ocular Inflammations. M. A. Wood, Iowa City.—p. 1111.
Human Cyclopia with Associated Ocular Anomalies: Case Report and Embryologic Interpretations. I. E. Wilber, New York.—p. 1120.
*Irrigations with Sulfanilamide as Treatment for Gonorrheal Conjunctivitis: Report of Fifteen Cases. W. J. Rein and O. B. Tibbetts, Richmond, Va.—p. 1126.
Snake Venom in Ophthalmology. M. E. Alvaro, São Paulo, Brazil.—p. 1130.

Sulfanilamide Irrigations for Gonorrheal Conjunctivitis.—Rein and Tibbetts compare the results of fifteen cases of gonorrheal ophthalmia treated by earlier methods with those of fifteen cases treated with sulfanilamide irrigations. A special nurse irrigated the infected eye or eyes every fifteen minutes, night and day, with a 0.5 per cent solution of sulfanilamide made up in physiologic solution of sodium chloride. The amount of solution used in the irrigations varied, but an amount sufficient to keep the eyes clean was administered consistently. In cases in which other gonorrheal complications were present—vaginitis or urethritis—supplementary sulfanilamide, from 30 to 60 grains (2 to 4 Gm.), was usually given orally, according to the age and weight of the patient. At the end of twenty-four hours the cornea was usually cleaner and brighter, secretion of pus was almost stopped, edema of the lids was rapidly receding and when the complication of corneal ulcer was present the lesion advanced no further or began to heal. Smears were taken daily from the conjunctival sac, and the patient was discharged when three consecutive daily smears showed that intracellular or extracellular diplococci were absent. To date there have been no relapses. In the first fifteen cases the average number of days before a negative smear was obtained was 27.2, while in the fifteen treated with sulfanilamide it was 6.8 days. The sulfanilamide treatment was not abetted by additional therapy; the patients were given only adequate balanced meals and general care, together with attention to any coincidental complications. The economic advantages resulting from the reduced period of hospitalization compared to that required by other standard measures are obvious.

Archives of Dermatology and Syphilology, Chicago

40: 687-866 (Nov.) 1939

- Seneear-Usher Syndrome: Review of Literature and Report of Six Cases. U. J. Wile and H. L. Arnold Jr., Ann Arbor, Mich.—p. 687.
- Nitritoid Reactions Due to Tryparsamide: Report of Case. F. A. Ellis, Baltimore.—p. 707.
- *Flaccid Paraplegia Following Diagnostic Use of Frei Antigen. H. L. Keim and R. F. Wakefield, Detroit.—p. 709.
- Pruritus Ani et Vulvae. Howard and Hugh Hailey, Atlanta, Ga.—p. 726.
- Epidermodysplasia Verruiformis (Lewandowsky-Lutz). F. Wise and D. L. Satenstein, New York.—p. 742.
- Pseudo-Atrophoderma Colli in Sisters. K. Frost, Los Angeles, E. Epstein, Oakland, Calif., collaborator.—p. 755.
- Yaws: Five Hundred Cases Observed in Cuba. V. Pardo-Castello, Habana, Cuba.—p. 762.
- Poikiloderma Atrophicum Vascular: Report of Case. O. G. Hazel, Oklahoma City.—p. 776.
- *Relation Between Syphilis and Tuberculosis in the Negro. S. Goldblatt, Cincinnati.—p. 792.

Paraplegia After Use of Frei Antigen.—Keim and Wakefield cite a case of flaccid paralysis which began eleven days after the intradermal diagnostic use of commercial mouse brain Frei antigen. Almost complete recovery had taken place four months later. The causative mechanism of these accidents is unknown. The authors feel that the cause must be sought not in the substances administered but in a constitutional predisposition of the person affected. The recent work on virus proteins and inapparent viruses suggests that altered virus activity might help clarify the nature of this individual susceptibility. The theoretical explanation offered is that after a period of incubation following nonspecific trauma of the skin (such as vaccination, injection, exanthems or virus eruptions) the patient responds with an interruption of his immunity by a reactivation of inapparent or latent viruses. This state of altered activity then leads to the production of paralysis and other unexplained clinical accidents.

Syphilis and Tuberculosis in the Negro.—As the literature concerning dual infection with syphilis and tuberculosis contains extremely divergent opinions, Goldblatt reviewed the records of 25,472 ambulatory Negro patients of all ages in an attempt to solve some of these difficulties. The diagnosis of syphilis was based on complete physical and routine serologic investigation of all applicants (by Wassermann, Kahn or Kline tests and usually by all three). Darkfield studies of doubtful open lesions and examinations of the spinal fluid of patients with suspected syphilis were carried out whenever possible. Serologic tests, including provocative procedures, were repeated whenever there was any reason to suspect the presence of syphilis. The diagnosis of tuberculosis was based on physical examinations together with fluoroscopic and x-ray studies of the chest. Investigation of the sputum for tubercle bacilli and guinea pig inoculations were made when the fluoroscopic and x-ray results did not confirm the physical observations. Necropsies were performed on 41 per cent of the patients who died (315), and the diagnosis of tuberculosis was confirmed in all cases in which section was done. Of the cases in which tuberculosis and syphilis were concomitant (186), anatomic evidence of syphilis was found in 34 per cent. It is probable that the distribution brought out by the investigation is representative of the Negro population of Cincinnati, as about half of the entire Negro population of the city came under observation. It was found that 33.7 per cent of the entrants to the clinic had syphilis either alone or combined with tuberculosis, whereas only 4.9 per cent came in with this specific complaint. Of the 2.5 per cent of patients diagnosed as having tuberculosis only 1.2 per cent were aware of their condition on entry. Tuberculosis was found in 318 (2 per cent) of the 16,919 patients without syphilis and in 326 (3.6 per cent) of the 8,556 patients with syphilis. Almost double (1.8 times) the amount of tuberculosis was found among the syphilitic as among the nonsyphilitic patients. Tuberculosis alone was more frequent in the younger patients than was syphilis alone. On the other hand, tuberculosis combined with syphilis (326 instances) was relatively more prevalent in the older age groups. Therefore the 310 patients who had contracted syphilis first must have contracted the tuberculosis at higher ages. It is shown that patients with syphilis are susceptible to tuberculosis at the higher ages to a much greater degree than are those who are free from the ravages of syphilis. Among nonsyphilitic persons tuberculosis enters at a maximal rate in the twenties, falling away at lower and at higher ages.

Among syphilitic persons the incidence of contracting tuberculosis increases steadily with age to about the age of 40 and then appears to level off or to decrease somewhat. Mortality rates for tuberculosis were increased by the presence of associated syphilis, particularly when the latter was in a late active stage. Antisyphilitic treatment administered to patients with both tuberculosis and syphilis prolonged life. It appears that the control of syphilis among Negroes will assist substantially in the control of tuberculosis.

California and Western Medicine, San Francisco

51: 217-288 (Oct.) 1939

- Medicine in a Changing World. T. Parran, Washington, D. C.—p. 222.
- *Boxer's Hemorrhage. J. L. Carr and A. M. Moody, San Francisco.—p. 227.
- Intraspinous Protrusions of Intervertebral Disks: Roentgenographic Findings. K. S. Davis, Los Angeles.—p. 230.
- Carcinoma of Prostate. F. Hinman and D. Smith, San Francisco.—p. 235.
- Some Indications for Roentgen-Ray Treatment. U. V. Portmann, Cleveland.—p. 241.
- Can Clinics Help Practitioners of Medicine? W. E. Carter, San Francisco.—p. 244.

Boxer's Hemorrhage.—Carr and Moody add three cases of hemorrhage to a case encountered by Moody in 1931 in which a boxer died after a severe beating. At necropsy scattered small contusion-like hemorrhages in the cortex, cerebellum and stem were found. The three present cases of contusion hemorrhages of the brain occurred in the stem after fisticuffs which produced no fracture of the skull or injury elsewhere in the brain, either cerebral or cerebellar. With the person, at least in the terminal stages of the beating, only partially conscious or, in the boxing terminology, "out on his feet," the musculature is more relaxed than normal, and muscle tone is definitely decreased. The motion of the head on the cervical vertebrae is more pronounced than during the usual state, and more acute angulation of the brain stem is possible on flexion and extension of the head. Because in the three cases that the authors encountered hemorrhage occurred in connection with fisticuffs of some nature, the specific and limited injury is regarded as peculiar to boxers or fighters—to those who are involuntarily beaten or in whom the type of injury causes acute angulation and pinching of the pons and medulla over the tentorium. The term "boxer's hemorrhage" is suggested for these injuries.

Florida Medical Association Journal, Jacksonville

26: 161-212 (Oct.) 1939

- Some Considerations of Hyperthyroidism from Medical Point of View. W. Merritt, Jacksonville.—p. 171.
- Surgical Aspects of Hyperthyroidism. W. D. Owens, Miami Beach.—p. 175.
- Prognosis in Heart Disease. J. G. Selizer, Orlando.—p. 180.
- Review of Syphilis at the State Hospital. J. C. Robertson, Chatahoochee.—p. 186.
- Common Foot Ailments. E. W. Cullipher, Miami.—p. 189.

Illinois Medical Journal, Chicago

76: 301-392 (Oct.) 1939

- Carcinoma of Larynx. L. B. Bernheimer, Chicago.—p. 319.
- Efficient Adjunct in Treatment of Corneal Ulcer. W. W. Gailey, Bloomington.—p. 322.
- Gastrointestinal Symptoms of Respiratory Infections in Children. J. F. Carey, Joliet.—p. 325.
- Cooperation of County Secretaries with Scientific Service Committee. R. S. Berghoff, Chicago.—p. 329.
- Cataract versus Glaucoma. L. Bolhman, Chicago.—p. 331.
- Rabies Control in Illinois. C. A. Z. Sharp, Springfield.—p. 335.
- Excretion Urography: Comparison with Retrograde Pyelography. A. E. Jones and R. A. Arens, Chicago.—p. 339.
- Technic of Radium Treatment of Radiosensitive Neoplasms Involving Anterior Vaginal Wall. F. E. Simpson, collaborators J. E. Breed and J. S. Thompson, Chicago.—p. 344.
- Control of Syphilis and Gonorrhea in State of Illinois. H. M. Soloway, Springfield.—p. 346.
- Modern Changes in Plastic and Reconstructive Surgery of Face and Neck. M. R. Guttman, Chicago.—p. 349.
- New Management for Relief of Angina Pectoris and Coronary Disease. O. A. Strauss, Chicago.—p. 351.
- Half a Million Deaths from Appendicitis. A. S. Jackson, Madison, Wis.—p. 355.
- Everyday Problems in Gynecology. L. Brady, Baltimore.—p. 357.
- Late Obstetric Hemorrhages as Cause of Maternal Mortality in Chicago During 1938. C. Newberger, Chicago.—p. 368.
- Undulant Fever: Its Sources, Modes of Infection and Prophylaxis. J. F. Shronts, Woodstock.—p. 373.
- Interauricular Septal Defect (Primitive Ostium Primum) Associated with Mitral Stenosis (Lutembacher's Syndrome) and Syphilitic Aortitis. J. D. Kirsbaum and L. Perlman, Chicago.—p. 380.
- Obstetric Analgesia, Anesthesia and Amnesia. E. Nash, Galcsburg.—p. 383.

Journal of Bacteriology, Baltimore

38: 355-484 (Oct.) 1939. Partial Index

- Studies on Capsule Formation: I. Conditions Under Which *Klebsiella Pneumoniae* (Friedländer's Bacterium) Forms Capsules. J. C. Hoogerheide, with technical assistance of Madeline H. Harrison, Philadelphia.—p. 367.
- Evaluation of Germicides by Manometric Method. J. O. Ely, Philadelphia.—p. 391.
- Chemical Factors Influencing Growth of Tubercle Bacilli: II. Organic Reagents. B. C. Sber and H. C. Sweany, Chicago.—p. 411.
- Lack of One of Somatic Antigens of Typhoid Cultures. Lois Almon and W. D. Stovall, Madison, Wis.—p. 419.
- Colony and Antigenic Variation in *Klebsiella Pneumoniae* Types A, B and C. W. A. Randall, Washington, D. C.—p. 461.

Journal of Pharmacology & Exper. Therap., Baltimore

67: 127-256 (Oct.) 1939. Partial Index

- Nicotinic Acid and Vitamin B Complex in Insulin Tolerance. J. C. Burke and A. R. McIntyre, Omaha.—p. 142.
- Influence of Disulfanilamide on Experimental Influenza Infections. D. R. Climenko, M. L. Crossley and E. H. Northey, Bound Brook, N. J.—p. 201.
- Effects of Sulfanilamide on Lower Vertebrates. J. T. Litchfield Jr., Baltimore.—p. 212.
- *Physiologic Adaptations in Cardiac Slowing by Digitalis and Their Bearing on Problems of Digitalization in Patients with Auricular Fibrillation. H. Gold, N. T. Kwit, H. Otto and T. Fox, New York.—p. 224.
- Studies of Certain Addiction Characteristics of (a) Dihydromorphine (Paramorphan), (b) Dihydrodesoxymorphine-D (Desomorphine), (c) Dihydrodesoxycodine-D (Desocodine) and (d) Methylidibromorphi-one (Metopon). C. K. Himmelsbach, Lexington, Ky.—p. 239.
- Effect of Fluidextract of Ergot and of Ergotamine on Emptying Time of Human Stomach. E. J. Van Liere and C. K. Sleeth, Morgantown, W. Va.—p. 250.

Cardiac Slowing from Digitalis in Auricular Fibrillation.—Gold and his colleagues studied the mechanism of cardiac slowing due to digitalis in ten patients with auricular fibrillation. Within a certain range of dosage the level of the ventricular rate in a given individual with auricular fibrillation may not reveal which of the two mechanisms (vagal abolished by atropine and extravagal not abolished by atropine) predominates, for the control of the rate may pass from the vagal to the extravagal factor as the dose is increased and in the reverse direction as the drug is eliminated, without a conspicuous change in the ventricular rate. This is due to reflex changes in vagal tone which play an important part in the ventricular slowing by digitalis in auricular fibrillation. An increased vagal tone in one stage of the action of digitalis and a decreased vagal tone after more intensive digitalization are the results of reflex adjustments. Depression of the vagus as a significant factor in the action of digitalis has not been considered heretofore. The results of the study suggest that the dose of digitalis should be reconsidered in the light of whether the vagal or the extravagal control of the ventricular rate is the more favorable mechanism for maintaining the optimal state of persons subject to auricular fibrillation and heart failure.

Medical Annals of District of Columbia, Washington

S: 285-316 (Oct.) 1939

- Carcinoma of Cervix. J. L. Southworth, Washington.—p. 285.
- Hemophilia in the Negro: Report of Case. E. P. Campbell, Washington.—p. 294.
- Diabetic Surgery at the Garfield Memorial Hospital from July 1, 1936, to Dec. 31, 1938. J. W. Lindsay, E. C. Rice, M. A. Selinger and K. H. Mish, Washington.—p. 296.
- Gastroscopic Aspects of Chronic Superficial Gastritis. F. A. J. Geier, Washington.—p. 300.
- Acute Benign Syphilitic Hepatitis: Report of Two Cases. G. W. Creswell, R. F. Golden and C. S. Coakley, Washington.—p. 303.

Minnesota Medicine, St. Paul

22: 667-734 (Oct.) 1939

- Principles of Fracture Treatment. C. L. Scudder, Boston.—p. 667.
- Advances in Knowledge and Control of Cancer. L. Hektoen, Washington, D. C.—p. 671.
- Keeping America Healthy. E. R. Coffey, Washington, D. C.—p. 677.
- Medical Care and Its Distribution in Canada. F. W. Jackson, Winnipeg, Man.—p. 681.
- Health of the People of Minnesota. W. A. O'Brien, Minneapolis.—p. 687.
- The National Health Program. M. F. Griffin, Cleveland.—p. 688.
- Health and the American Standard of Living. F. S. Chapin, Minneapolis.—p. 692.
- Minnesota Medical Legislation. J. A. A. Burnquist, St. Paul.—p. 697.
- Professional Service and the Public Trust. H. Shipstead, Minneapolis.—p. 701.
- The Doctor and His Patient. G. Earl, St. Paul.—p. 703.

New England Journal of Medicine, Boston

221: 593-634 (Oct. 19) 1939

- Diverticula of Colon. L. A. Buie, Rochester, Minn.—p. 593.
- Hydatidiform Mole and Chorionepithelioma. B. Tenney Jr. and F. Parker Jr., Boston.—p. 598.
- *Use of Paredrine to Correct the Fall in Blood Pressure During Spinal Anesthesia. M. D. Altschule and S. Gilman, Boston.—p. 600.
- Acute Lupus Erythematosus Disseminatus: Report of Case. A. W. Contratto and S. A. Levine, Boston.—p. 602.

Paredrine for Fall in Blood Pressure in Spinal Anesthesia.—Altschule and Gilman point out that paredrine (p-hydroxy- α -methyl-phenylethylamine hydrobromide), a drug recently introduced, has a powerful pressor action due to stimulation of the smooth muscle of the arterial wall and is effective when given by mouth, intramuscularly or intravenously. Good pressor effects are obtained with 20 or 30 mg. orally, 10 or 20 mg. intramuscularly and 5 or 10 mg. intravenously. These results suggested that the drug might be useful in correcting the fall in blood pressure observed during spinal anesthesia. The purpose of the present communication is to report the results obtained with paredrine in fifty cases. Measurements of pulse rate and blood pressure were made every five minutes; when the latter fell markedly, paredrine was administered in doses of 10 to 20 mg. intramuscularly or 5 to 10 mg. intravenously, or both. In every case the administration of paredrine was followed by a return of blood pressure to a satisfactory level. The pressure usually began to rise within five minutes after the intramuscular injection of 10 mg. of the drug; if no rise was noted at this time, a second injection of the same dose was given. This invariably secured the desired result. The authors conclude that paredrine is useful in raising the blood pressure to satisfactory levels if it becomes unduly lowered by spinal anesthesia. The pulse rate is maintained at, or returns to, levels obtaining before the induction of spinal anesthesia. Paredrine has little or no direct effect on the heart, its direct action being apparently limited to the peripheral vessels. No untoward effects have been noted after its administration.

Oklahoma State Medical Assn. Journal, McAlester

32: 359-398 (Oct.) 1939

- Pseudomycotic Leg Ulcers. J. F. Hamilton, Memphis, Tenn.—p. 359.
- Conditions Involving External Ear. H. Evans, Tulsa.—p. 365.
- Use of X-ray in Obstetrics. P. N. Charbonnet and E. O. Johnson, Tulsa.—p. 371.
- Infection in Extremities of Diabetics. W. D. Hoover, Tulsa.—p. 375.
- Renal Emergencies. A. R. Sugg, Ada.—p. 377.

Psychiatric Quarterly, Utica, N. Y.

13: 599-808 (Oct.) 1939

- Some Unconscious Determinants in Homicide. P. R. Lehrman, New York.—p. 605.
- Psychiatry and the Law—Cooperators or Antagonists? W. Overholser, Washington, D. C.—p. 622.
- Blood-Cerebrospinal Fluid Barrier of Normal Children as Determined by Bromide Permeability Quotient. F. A. Mettler, M. Robinow, W. R. Brown and C. M. Burpee, Augusta, Ga.—p. 639.
- Humor and Hypomania. I. H. Coriat, Boston.—p. 681.
- *Depression as Chief Symptom. L. H. Ziegler, Wauwatosa, Wis.—p. 689.
- Method for Differentiating Manic-Depressive Depressions from Other Depressions by Means of Parotid Secretions. E. I. Strongin and L. E. Hinsie, New York.—p. 697.
- The Christian Formulation and Medicine. S. E. Jelliffe, New York.—p. 705.
- *Value of Diphenyl Hydantoinate (Dilantin) in Psychoses with Convulsive Disorders. N. D. Black, Marcy, N. Y.—p. 711.
- Contribution to Problem of Alcoholic Deterioration. J. J. Dorey, W. Hamburger and R. B. Sampliner, Utica, N. Y.—p. 721.
- Personality in Alcoholic Disorders: Acute Hallucinoses and Delirium Tremens. N. J. T. Bigelow, S. R. Lehrman and J. N. Palmer, Utica, N. Y.—p. 732.

Depression as Chief Symptom.—Ziegler studied 111 patients whose first chief symptom consisted of well defined attacks of depression or low spiritedness. Their ages ranged between 16 and 77 years. Sixty-five were men. Essentially all occupations and the major professions were represented among them. Possessed of serious and sensitive natures, with a rigid singleness of purpose in their drives to succeed, they were not interested in hobbies and avocations. The majority leaned to the side of being introverted, self-centered persons. The onset of their depression was usually insidious and coincident with family trouble, financial loss, sickness or death. While depression was obvious enough when the patient consulted the surgeon or internist, it was not the earliest manifestation of the disorder for which relief was being sought.

This often proved to be a slowing up, a withdrawal from the usual activities, fatigue, loss of appetite and weight, and insomnia. Depression, worrisomeness, anxious concern about self, shame at the disorder, sadness, melancholy, despondency and low spirits usually appeared later to their fullest extent. Unusual and oftentimes mystifying bodily sensations were common, leading many of the patients from physician to physician and some finally to various creeds, cults and quacks. First-hand data about thought and activity were ascertained only by friendly conversations and visits. Appraisals of thought, emotional state and activity are no less significant than ascites, heart murmurs or other signs of disease. These patients talked about themselves—out of all proportion to everything else. Not only was thinking slow, labored and limited in scope, but most of it was devoted to disagreeable topics which would correlate all too poorly with the actual events of life. Many patients traced the onset of the illness to the late winter or early spring months. The parents of many were of diverse temperament or personality makeup. The study of the previous lives of these patients shows the methods employed to cure the pathologic emotional state. When surgery was resorted to it tended to be directed to the thyroid. Even today goiter is too generally believed to be a cause of depression (often called nervousness). Mucous colitis or allergic phenomena were too readily accepted as causes when in reality they were more likely to be effects of the pathologic emotional state. These patients were grossly and quite universally misunderstood, which added much to their already great discomfort. Some of them were accused by relatives or friends of "putting on" their illnesses "or imagining them" and were upbraided for lack of self control. It is best for the patient of this type to go to a suitable sanatorium or hospital and, as far as possible, to make this step of his own volition. In treating these patients sleep was restored as far as possible by medicines and warm baths were used in moderation and were properly timed. Mild sedatives were given to relieve the daily distress, which is usually at its worst in the morning. The diet was organized so that lost weight tended to be regained. The hands were kept busy so that the patient had less chance to think of morbid things. Reasonable assurances of a favorable outcome were implied. The author has witnessed the recovery of depressed patients 75 years of age. He has also seen patients recover after being depressed for ten years or longer. But exact science has yet to evolve a specific method of cure, despite the startling immediate effects of metrazol and the claims for treatment with estrus-inducing products. From one to two years after treatment fifty-seven patients were heard from or were reexamined. Four had grown worse and two of these were in a state hospital. The condition of sixteen was unchanged. Thirty were improved and one of these was in a sanatorium. Seven were completely well. Forty-two were carrying on at their work as best they could. Since infectious diseases are on the wane, it behooves the next generation of physicians to learn more about the pathologic aspect of depression. The prevention of depressions, the author believes, should have a place in the public health programs of the future.

Diphenyl Hydantoinate for Psychoses with Convulsions.—Black used diphenyl hydantoinate for seventeen patients with psychoses and convulsions who had not reacted well to other forms of chemotherapy. Two patients had complete relief from seizures (a minimum of six months without a seizure) and seven others had a reduction in the number and severity of seizures. The remaining eight either were not influenced by the drug or showed an increase in the number and severity of convulsions. Mental improvement was in direct relationship to the control or reduction in the number of seizures. Treatment of one patient had to be discontinued because of toxic symptoms, and of three patients because of an increase in the number and severity of seizures. Ten are still receiving the drug. Three died. The author believes that the use of the drug should be restricted to patients who do not respond to less toxic forms of treatment.

Rhode Island Medical Journal, Providence

22: 161-174 (Oct.) 1939

Metrazol Therapy at the Charles V. Chapin Hospital. H. E. Kiene, H. Miller and R. J. Streitzwieser, Providence.—p. 161.
Results and Complications of Metrazol Therapy for Mental Disease. C. Rupp, Howard.—p. 164.

Surgery, St. Louis

6: 491-652 (Oct.) 1939

- Surgical Treatment of Acute Cholecystitis and Common Duct Obstruction. H. Finsterer, Vienna.—p. 491.
Solitary Nonparasitic Cyst of Liver. W. K. Jennings, Evanston, Ill.—p. 507.
*Maintenance of Nutrition in Surgical Patients, with Description of Orojejunal Method of Feeding. A. Stengel Jr. and I. S. Ravdin, Philadelphia.—p. 511.
Results of Intravenous and Intra-Arterial Administration of Fluids in Traumatic Shock Produced Experimentally. D. B. Kendrick Jr., Rochester, Minn.—p. 520.
*Acute Perforated Peptic Ulcers. M. W. Kelly, St. Louis.—p. 524.
Experimental Osteomyelitis: Effects on Ribs of Increased Intramedullary Pressure and of Toxin Producing and Non-Toxin Producing Strains of Staphylococci. R. D. Cressman and A. Blalock, Nashville, Tenn.—p. 535.
Tumors of Salivary Glands: I. Review of Prognostic Data from Literature. J. W. Houck, Richlands, Va.—p. 550.
Id.: II. Study of Forty-Eight Cases, with Presentation of New Clinical Classification. J. W. Houck, Richlands, Va.—p. 565.
Bathing Trunk Nevus. H. Conway, New York.—p. 585.
Esophageal Stenosis: Spontaneous Stricture in Young Child Followed by Spontaneous Opening One Year After Tuhovalvular Gastrostomy. E. M. Miller, Chicago, and R. T. Bothe, Aurora, Ill.—p. 598.
Simplified Blood Transfusion Set. S. W. Widger and R. Stevens Jr., Rochester, N. Y.—p. 602.
Primary Tuberculous Peripheral Vascular Disease. T. Thieme and W. G. Maddock, Ann Arbor, Mich.—p. 604.
Simple Method of Applying Head Dressings. H. D. Cogswell and C. A. Thomas, Tucson, Ariz.—p. 610.

Maintaining Nutrition of Surgical Patients.—Stengel and Ravdin call attention to some of the dietary deficiencies of surgical patients. They describe the orojejunal method of feeding and discuss its advantages when there is no interference with the protein regenerating mechanism. It has been their experience that the early introduction of the feeding mixture into the distal jejunum results in the earlier return of peristaltic activity after operation. They have been impressed by the smoothness of the convalescence and by the fact that the patients do not request food, even though orojejunal feeding in some instances has been continued for as long as fourteen days after operation and the calorie intake has not been high. During this time, fluid and electrolyte balance, as a rule, can be maintained without resort to intravenous administration. This is of some importance, for phlebitis frequently occurs when prolonged intravenous therapy, especially with dextrose, is maintained. Frequently the injudicious intravenous use of large amounts of sodium chloride postoperatively precipitates edema when this complication would not have developed had nutrition been maintained and if the water and salt intake were not excessive. Too much emphasis has been placed on the fluid and salt requirements of these patients and too little on associated factors which play an important part in keeping fluids in the blood vessels. The method need not always be used, for not all patients have suffered prolonged nutritional deficits. It can be used, however, for every patient subjected to a gastro-enteric anastomosis when suction drainage is to be carried out after operation, for it simplifies the postoperative management since the nutritional requirements of the patient can be fulfilled more adequately.

Acute Perforated Peptic Ulcers.—A review of the diagnosis, treatment and results in 152 cases of acute perforated peptic ulcer treated surgically at the St. Louis City Hospital during a period of six years is presented by Kelly. All the patients were either on relief or unemployed. There were 124,317 general admissions to the hospital during the six years under study, giving an incidence of 0.0012 per cent of perforated peptic ulcers. Most of the perforations occurred in the middle years of life. All patients 70 or more years of age died. The number of cases that occurred during the four seasons was approximately the same, there being only a slight, but insignificant, increase during the spring and fall months. Only seven patients were women, 4.6 per cent. This ratio of men to women compares favorably with many other reports. A history of previous gastric disturbance was given by 128, or 84.2 per cent, of the patients. This fact indicates that previous gastric disturbances are a valuable aid in diagnosis. The duration of symptoms varied from seven days to fifty-five years. Twenty-four patients experienced the pain of perforation as the first symptom of their gastric disturbance. No relationship was

found between the duration of ulcer symptoms before perforation and the mortality rate. When the patient first experienced the pain of perforation, it was described by sixty-two as being in the epigastrium and general abdomen. The next most frequent location of the pain was in the epigastrium alone, fifty-two times. Generalized abdominal pain was described by twenty-three patients. Fifteen patients described their pain as occurring in the middle or lower part of the abdomen or at the upper right quadrant; 113 vomited after the perforation and before operation, while thirty-nine did not vomit. A study of the symptoms of perforated gastric and duodenal ulcers indicates that an anatomic location of the ulcer cannot be made from the history of the perforation. An acute perforation constitutes a surgical emergency and delay in operation increases the mortality rate. The author believes that the simplest and quickest operation should be performed in acute perforations and that the operation of choice is simple purse-string closure; frequently a tab of omentum was sutured over the closure. This procedure is used with the view in mind of preserving the life of the patient and seems to be attended by the least mortality. Only a small percentage of cases necessitated secondary operations, thus justifying the procedure. Of the 140 cases in which operation was performed drainage was instituted in 102 and the mortality rate was practically the same in the two groups. Thirty-nine, or 27.8 per cent, of the 140 patients operated on died. A postmortem examination was made in the twelve cases in which operation was not done. Three of the patients who were not operated on were more than 71 years of age and were in a moribund state on entry. They died soon afterward. Four were in extremely poor physical condition on entry and supportive measures were instituted, but the patients did not rally enough to justify operating. One patient who died shortly after admission did not have a diagnosis until the postmortem examination. Four incorrect diagnoses were made. The average stay in the hospital for the patients who recovered was 25.1 days. Of the postoperative deaths 51 per cent occurred within the first three days. A follow-up was made on fifty-seven of the 101 patients discharged. A patient was considered as having a good result if he was entirely free from pain and was able to work. A few of these patients remained on a diet. If the patient at times had pain which was easily controlled by a diet, the result was considered as fair. If ulcer symptoms were constant the results were considered poor. By these standards, forty-three were considered as having a good result, ten a fair result and four a poor result.

Tennessee State Medical Assn. Journal, Nashville

32: 339-378 (Oct.) 1939

- Clinical and Epidemiologic Features and Differential Diagnosis of Rocky Mountain Spotted Fever and Endemic (Murine) Typhus Fever. L. L. Lumsden and C. B. Tucker, Nashville.—p. 339.
Study of Infant Mortality in Tennessee, 1934-1937. J. M. Saunders and Ruth R. Puffer, Nashville.—p. 342.
Relationship Which Should Exist between the Industrial Physician and the Private Practitioner of Medicine. C. F. N. Schram, Kingsport.—p. 350.
Some Phases of Anemias. R. E. Ching, Memphis.—p. 354.

Texas State Journal of Medicine, Fort Worth

35: 385-450 (Oct.) 1939

- Hemorrhage in Obstetric Patients. J. B. Pastore and H. J. Stander, New York.—p. 390.
Diaphragmatic Hernia. A. O. Singleton, Galveston.—p. 397.
Action and Uses of Castilian Malva Solution in Infectious, Necrotic and Gangrenous Lesions. R. P. Thomas Jr., San Antonio.—p. 403.
Rhabdomyosarcoma of Skeletal Muscle: Report of Two Cases. S. M. Richmond, San Angelo.—p. 407.
Treatment of Pneumonia in Children. J. Zahorsky, St. Louis.—p. 414.
Newer Methods of Treating Pleural Effusions and Tuberculous Empyema. H. M. Anderson, Sanatorium.—p. 419.
Diagnosis and Management of Allergic Rhinitis. M. C. Barnes, Waco.—p. 421.
Sarcoma of Uterus: Report of Case. D. R. Venable, Wichita Falls.—p. 425.
*Treatment of Drug Addicts at the United States Public Health Service Hospital, Fort Worth, Texas. W. F. Ossenfort, Fort Worth.—p. 428.

Treatment of Drug Addiction.—Ossenfort states that with the concept that drug addiction is the result of mental illness treatment at the Fort Worth (Texas) Public Health Service Hospital is divided into three main categories: (1) complete admission study of the patient as a whole to establish a base line

in the individual case; (2) prolonged treatment on the basis of the initial observations throughout the remainder of the patient's stay in the hospital, and (3) adjustment of outside conditions in preparation for his eventual return to society. Since so many addicts are recruited from the more or less unstable portion of the population it is not anticipated that results will ever be uniformly successful. The physical condition of patients is always remarkably improved, and their power of resistance to influences that tend to cause a reversion to narcotics is strengthened in a large majority of cases. It is not hoped, however, to erase in all cases fundamental defects to the point at which they may not become manifest again when the afflicted person is subjected to severe environmental stresses. The results seem to justify the conviction that the management of drug addicts as patients who are mentally ill is logical. It is not believed that a long prison sentence is an aid to rehabilitation. The prevention of addiction among the unstable is only a part of a broad program of mental hygiene. Patients suffering from asthma or migraine are especially susceptible to addiction because of the recurrence of attacks. It is doubtful whether such persons should ever be given morphine. Morphine should never be used to tide a patient over the effect of an alcoholic spree. Thousands of persons have been made addicts by just such treatment. In painful conditions calling for an opiate it is best to start with codeine or, if morphine is at first necessary, to change to codeine as soon as possible. New opiates should be used with caution.

Western J. Surg., Obst. & Gynecology Portland, Ore.

47: 561-610 (Oct.) 1939

- *Gas Gangrene: Analysis of Thirty-Four Cases Treated in Past Five Years in San Francisco Hospital, with Special Reference to Roentgen Ray Therapy. A. J. Williams and H. V. Hartzell, San Francisco.—p. 561.
Factors Influencing Prognosis of Carcinoma of Colon. C. W. Mayo, Rochester, Minn.—p. 566.
Metastatic Malignancy in Bone: Absence of Roentgenographic Signs. H. Snure, Los Angeles.—p. 571.
Neglected Adenomas of Thyroid. R. W. Binkley, Selma, Calif.—p. 575.
Primary Eosinophil Adenocarcinoma of Hypophysis: Case Report. G. A. C. Snyder and C. P. Larson, Fort Steilacoom, Wash.—p. 581.
*Ovarian Hypofunction Previous to Climacteric: Report of 300 Cases Treated with Estrogen. L. F. Hawkinson, Oakland, Calif.—p. 584.
Further Observations on Fallacy of Use of Iodine Immediately After Bilateral Subtotal Thyroidectomy. M. Davison and L. J. Arles, Chicago.—p. 589.
Theory and Results of Prophylaxis of Endemic Goiter in Switzerland. H. Eggenberger and F. M. Messerli, Herisau, Switzerland.—p. 596.
Surgical Approach to Hypertension: Division IX. F. M. Findlay, San Diego, Calif.—p. 600.

Gas Gangrene.—Williams and Hartzell compare the results obtained in seventeen consecutive cases of proved gas gangrene in which roentgen therapy was administered with those of seventeen similar cases in which the treatment was not given. Cases in which there was bacteriologic proof alone without clinical proof were not included. Seven patients entering the Emergency Hospital who from the nature of their injuries might have developed gas gangrene were treated prophylactically and none had gas gangrene. Conclusions are not drawn from this group, but the authors believe that the possibilities of prophylactic treatment in such cases are suggested. In comparing the mortality rates of the two series the authors point out that of twelve traumatic cases in each group there is a difference of 50 per cent. The only fatality among the twelve patients who had roentgen therapy was of a patient practically moribund when the treatment was started. This patient died seven hours after the first treatment. There were also eight patients (four in each group), all of whom died with arteriosclerotic gangrene complicated by gas gangrene. At necropsy two of the untreated showed gas in the tissues but in none of the four that had been irradiated was there such evidence. Of two patients with diabetic gangrene complicated by gas gangrene, one received roentgen therapy and this was the only recovery in the complicated series. Of those irradiated, none died from gas gangrene; two died from pulmonary embolism, one from pneumonia and the other from arteriosclerotic heart disease. No gas gangrene was present at necropsy in these cases. This type of case constitutes a distinct entity and it is felt that these should not be grouped with the traumatic series. The authors believe that a rational

procedure in any given instance of compound fracture as the patient enters the hospital would be as follows: 1. Conservative surgery—adequate débridement should be done. 2. X-ray examination should be made to determine the extent of the injuries and the presence of gas in the tissues. 3. If gas infection is suspected another roentgenogram should be taken within six hours. 4. If there is clinical, bacteriologic or x-ray evidence of gas gangrene, roentgen therapy should be given at once and repeated at least once every twelve hours for three days.

Ovarian Hypofunction Previous to Climacteric.—Hawkinson discusses the results of estrogen therapy in 300 cases of menstrual disorders associated with ovarian underfunction. Patients with an artificial menopause and, when possible, those with the natural menopause were excluded. Also all patients whose symptoms might be accounted for by organic complications were eliminated. The patients' ages ranged from 14 to 35 years, with an average age of 27 years. The average duration of symptoms was fourteen months with the exception of thirty-four patients who complained of symptoms since the menarche. More than one third of the patients had symptoms soon after pregnancy or abortion and more than 12 per cent after salpingectomy or the removal of one ovary. The symptoms, as in the menopausal syndrome, are due primarily to a deficiency of estrogen and, with the exception of the menstrual disturbances and the changes in the vaginal smears, are of a subjective nature. Nervousness was an almost constant complaint but was seldom objective in type. Fatigability and lassitude were almost as prevalent as nervousness. Almost 40 per cent had disturbances of sleep. Excitability and irritability, reflected by exaggerated response to slight emotional shocks, were common. Gastric disturbances, cardiac symptoms and vague and indefinite pains occurred in many cases without demonstrable pathologic changes. The most common cardiac symptoms were palpitation and tachycardia. Flushes and chills were complained of by 18 per cent of the women. Headaches were complained of by 46 per cent of the patients. Of the 265 who had definite menstrual disturbances, 174 suffered from scanty menstruation. Eighty-nine had dysmenorrhea and an almost equal number had irregular menstruation. Menorrhagia, metrorrhagia and secondary amenorrhea were not as common. A number of patients had two or more disorders of menstruation. Many patients stated that there was a difference in the intensity of the symptoms month by month, suggesting the involvement of one ovary. Only standardized estrogenic preparations were used in treatment. The amount of estrogen required to relieve symptoms varied with each patient. Some patients responded to oral therapy alone, while others required as much as 10,000 international units (2,000 rat units) of estrogen in oil by hypodermic injection three times weekly. Initially the oral preparations were usually administered. If there was no response within three to four weeks, larger doses of estrogen in oil were administered intramuscularly. Combined oral and hypodermic therapy was of advantage in the severe cases. After a satisfactory response had been obtained, the dose was gradually reduced, and only when the patient remained free from symptoms was it discontinued. The average patient required treatment for three or four months. However, fifty-seven women required continuous oral treatment to remain symptom free. With the exception of an occasional local reaction at the site of injection, no ill effects were observed. The subjective symptoms responded more favorably than did the associated menstrual disturbances. Data show that 44.3 per cent were relieved of the majority of symptoms, 31 per cent were improved and 24.7 per cent experienced little or no relief. Forty-four patients (74.5 per cent) found that estrogen decreased the severity and frequency of attacks of menstrual migraine. Fourteen (31.8 per cent) obtained complete relief from headaches. Of the seventy-eight women who complained of occipitocervical aching, sixty-one were relieved. Of the fifty-four patients who had a low hemoglobin with or without a corresponding decrease in the number of erythrocytes, twenty-nine (57.4 per cent) showed improvement in the hemoglobin level and number of erythrocytes following the administration of estrogen. The majority had experienced difficulty in maintaining an improved level with liver and iron therapy.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian J. Exper. Biol. and M. Science, Adelaide

17: 225-332 (Sept.) 1939. Partial Index

Tissue Injury by Volatile and Gaseous Anesthetics. C. H. Kellaway and E. R. Trethewie.—p. 225.

Poliomyelitis: I. Intra-Ocular Inoculation as Standard Method for Demonstration of Neutralizing Antibodies. F. M. Burnet, A. V. Jackson and E. G. Robertson.—p. 253.

*Id.: II. Significance of Neutralizing Antibodies in Human Serums. F. M. Burnet and A. V. Jackson.—p. 261.

Passive Immunity in Experimental Pertussis. E. A. North, E. V. Keogh, G. Anderson and S. Williams.—p. 275.

Biochemical Changes Occurring During Storage of Human Blood. Marjorie Bick.—p. 321.

Neutralizing Antibodies of Serums in Poliomyelitis.—

Burnet and Jackson tested the serums of fourteen patients with clinical poliomyelitis and contacts of these patients for neutralizing antibodies. Of the children with the disease, five possessed antibody at the time of the acute illness. The other nine had insufficient antibody for neutralization and eight of these even when convalescent still had insufficient antibodies for neutralization. Of fifteen contacts six possessed antibodies, nine did not. Therefore it is seen that serums show no indication of an increase in serum antibody as a result of (or concomitant with) infection or contact. Some of the children with paralytic poliomyelitis had antibodies at the onset of the disease, while others who had none at the onset still had none some months later. In summary, children in the early stage of acute paralytic poliomyelitis may possess relatively large amounts of circulating antibody or they may have none. In those who have none, none develops within two to three months, in the experience of the authors. It has been assumed that the antibody against poliomyelitis virus which is present in most adult serums results from subclinical infection with the virus at those times when the disease is prevalent in the community. There is fairly substantial evidence that a smaller percentage of adults living in isolated rural communities possess poliomyelitis antibody than is the case in urban populations. The authors state that their results, which are consistent with those of Brodie and others (1937), are completely opposed to such a view unless the unlikely assumption is made that antibody first appears more than a year after the immunizing infection. In monkeys recovering from experimental poliomyelitis antibody appears as a rule from four to eight weeks after infection, and its activity is much lower than that of the average human adult serum. They believe that the best interpretation of the facts is that in human beings the poliomyelitis virus infects only nervous tissues and that in most cases little virus or antigenic material derived from it passes to the antibody-producing cells of the body. Therefore there is no significant appearance of circulating antibody in most instances. Since antibody obviously of specific origin can be obtained in monkey serum after infection, and since certain methods of human vaccination are reported to produce antibody in children, the possibility that a small proportion of individuals do produce antibody after poliomyelitis must be left open, but such production cannot possibly account for the occurrence of relatively high titer antibody in a majority of human beings more than 10 years of age. The orthodox view is that this antibody is a result of a process of widespread latent immunization by subclinical infections with the specific virus. There is no direct evidence in favor of this hypothesis. If specific immunization is excluded there seem to be three possible alternatives for the origin of "poliomyelitis antibody" in human serum: 1. It may develop as a result of a nonimmunologic change in serum globulin, which develops with age in the absence of antigenic stimulus. 2. It may be the response to some commonly encountered antigen which has determinant groups in common with the poliomyelitis virus. The antigen must reach the antibody-producing cells in considerable amount and hence is likely to be derived from a micro-organism which has some invasive power but is not a strictly neurotropic virus. 3. The antibody is a nonspecific or group antibody, appearing as a result of repeated infections with various micro-organisms not necessarily related antigenically to poliomyelitis virus. Of these alternatives it seems to the authors that the second is the most likely and that the antigenic stimulus evidently should be looked for among the micro-organisms (bacteria or viruses) which produce common minor infections.

British Medical Journal, London

2: 753-794 (Oct. 14) 1939

- Weil's Disease in the Northeast of Scotland: Account of 104 Cases. L. S. P. Davidson and J. Smith.—p. 753.
 *Antirachitic Value of Human Milk. J. C. Drummond, C. H. Gray and N. E. G. Richardson.—p. 757.
 Pathology of Chloride Metabolism in Man. A. Lyall.—p. 760.
 Notes on Psychiatric Casualties of First Days of War. G. Pegge.—p. 764.
 *Diabetes and Kidney Failure. K. E. Barlow.—p. 765.

Antirachitic Value of Human Milk.—According to Drummond and his associates, the mean antirachitic potency of the milk yielded by women on diets supplying in all probability from 100 to 250 international units of vitamin D daily and that of the milk from women given large amounts of vitamin D during the latter half of pregnancy indicates that 10 international units per hundred cubic centimeters of breast milk represents about the normal maximal value. Possibly the same evidence can be put forward to indicate that an intake of about 200 international units represents the minimal daily requirement of the nursing mother. The large doses of vitamin D given to some of the mothers over several months of pregnancy failed to bring about anything approaching a proportional increase in the vitamin D content of the milk. It may be, therefore, that there is an optimal concentration of this substance regulated by the mammary gland. The reason that the assimilation of the bone forming elements is better (from 40 to 60 per cent) when the child is fed on mother's milk than when cow's milk is used (from 20 to 30 per cent) has not yet been determined, but it may be important that the calcium-phosphorus ratio of human milk approximates that of bone mineral, the calcium-phosphorus ratio of cow's milk being considerably smaller. The relatively small concentration of calcium and phosphorus (from 27 to 34 mg. of calcium and from 13 to 17 mg. of phosphorus per hundred cubic centimeters of milk) in human milk as compared with cow's milk (from 100 to 160 mg. of calcium and from 70 to 100 mg. of phosphorus) raises several curious problems, of which the most important has been revealed by the careful studies of Leitch (1937), who has shown that the total intake of calcium when mother's milk is taken, much less the quantity actually retained, is often insufficient to provide the amount calculated as being requisite to maintain the composition of the body either at the maximal figure of 10 Gm. of calcium per kilogram of body weight or at the smaller estimate of 8.13 Gm. This observation led Leitch to consider the possibility that breast-fed infants must often exhibit not only imperfect calcification of new matrix but also osteoporotic changes in bones which at birth were relatively firm. It may be a fact that undetected rachitic changes are much more common in breast-fed infants than is suspected (Maddox, 1932). The authors state that there seem to be only two explanations for Leitch's figures. Either the newborn infant carries a reserve store of calcium sufficient to provide for adequate calcification during the months when the mother's milk does not provide enough or the data of the metabolism experiments which Leitch has used for her analysis are misleading, perhaps because the milk was not of such a quality as to favor optimal calcium retention. It remains uncertain in view of the evidence reviewed by Leitch whether changes in the dietary intake of calcium or phosphorus are reflected to any significant extent in the composition of mother's milk. The authors' results suggest that such an effect is not detectable, at all events in the first two or three months of lactation. Some of the mothers that they observed had been receiving about 2 Gm. of calcium lactate daily during the latter half of pregnancy, but this supplement to calcium-deficient diets did not appreciably influence the calcium content of their milk. There is need for more information not only about the composition but also about the yield of milk from mothers whose diet, adequate in all other respects, provides at least 2 Gm. of calcium, 1.5 Gm. of phosphorus and 300 international units of vitamin D daily. If such milk were made the subject of metabolic investigation on infants it is possible that some of the disturbing discrepancies would be dispelled.

Diabetes and Kidney Failure.—Two cases in which diabetes and nephrosclerosis coexisted are cited by Barlow. The evidence has obvious bearings on insulin therapy. In uncomplicated diabetes, glycosuria may be taken as evidence of a raised blood sugar level which may require to be lowered by

insulin. In the nephritic patient, glycosuria has not the same significance. It is likely to be present in cases in which the blood sugar is not raised to a degree likely to be toxic to cell function, and if insulin were to be pushed in these cases, under the guidance of urinary dextrose, it seems probable that dangerous and even destructive hypoglycemia might be induced. The logical conclusion is that, so far as the diabetes is concerned the patient with mild diabetes is better off with nephritis than without it. Whether this supposition is borne out, time and observation will reveal.

Journal of Endocrinology, London

1: 117-230 (Sept.) 1939. Partial Index

- Separation of Follicle-Stimulating Fraction from Pituitary Gonadotropin. H. Rinderknecht and P. C. Williams.—p. 117.
 Duration of Action of Certain Natural and Synthetic Estrogens When Administered Orally or by Injection. C. W. Emmens.—p. 142.
 Effect of Sex Hormones, Cortin and Vasopressin on Water Retention in Reproductive Organs of Monkeys. S. Zuckerman.—p. 147.
 Precipitins in Antigonadotropic Serums. M. Van den Ende.—p. 156.
 Further Observations on Progonadotropic and Antilytropic Activity of Antiserums to Extracts of Anterior Pituitary Gland. I. W. Rowlands.—p. 177.
 Direct Gynecogenic and Indirect Estrogenic Action of Testosterone Propionate in Female Rats. R. L. Noble.—p. 184.
 Effects of Synthetic Estrogens and Carcinogens When Administered to Rats by Subcutaneous Implantation of Crystals or Tablets. R. L. Noble.—p. 216.

Proceedings of Royal Society of Medicine, London

32: 1371-1550 (Sept.) 1939. Partial Index

- Simple Ulcer of Esophagus and Short Esophagus. P. J. Briggs, R. C. S. Dick and A. Hurst.—p. 1423.
 Autonomic Imbalance and Borderline States of Thyrotoxicosis. L. Martin.—p. 1424.
 *Leukopenic Myelosis. R. B. Scott.—p. 1429.
 Pathology of Tumors of Urinary Tract. W. D. Newcomb.—p. 1455.
 Radiologic Diagnosis of Neoplasms of Urinary Tract. R. Williams.—p. 1467.
 Some Problems in Surgery of Old Age. C. Frankau.—p. 1483.
 Hemorrhagic Purpura (Essential Thrombocytopenia) as Complication of Excision of Rectum. J. P. Lockhart-Mummery.—p. 1488.
 Ossification in Rectal Cancer. C. E. Dukes.—p. 1489.
 Intestinal Diverticula. H. Edwards.—p. 1495.
 Ancient Pregnancy Tests in Light of Contemporary Knowledge. H. P. Bayon.—p. 1527.

Leukopenic Myelosis.—In this paper Scott uses the term leukopenic myelosis to describe a type of myeloblastic leukemia in which the number of leukocytes in the circulating blood is subnormal for the whole or the greater part of the course of the disease. It is one variety of the complaint to which that contradiction in terms aleukemic leukemia has been applied. It would be idle to suggest that the leukopenia implies a disease process in any fundamental way different from myeloblastic leukosis with a leukemic blood picture, but clinical and hematologic convenience makes a segregation of such cases desirable, for they frequently offer diagnostic difficulty. Leukopenic myelosis is not a rare disease; in the last four years twenty-two cases have been encountered (more than three times the number of analogous leukemic cases seen during the same period) and this paper is concerned with a brief review of the clinical and hematologic observations in this series. A table grouping the patients according to age and sex indicates that no age and neither sex is particularly susceptible. The disease is characterized by three cardinal symptoms: anemia, a hemorrhagic tendency and a liability to necrotic angina. It is possible to differentiate acute, subacute and chronic types. The main characteristic of all forms is a progressive anemia; in acute cases hemorrhagic phenomena and necrotic angina are common. The blood count is characterized by orthochromic or hyperchromic anemia, sometimes with reticulocytosis and erythroblastosis. Leukopenia may persist throughout the course, or a terminal leukemia may occur, especially in the chronic cases. The features of the differential count are the presence of myeloblasts, although the percentage may be below 5 and the hiatus leukopenicus. Thrombocytopenia usually indicates a rapid course. The clinicohematologic picture leukopenic myelosis may be mimicked more or less closely by pernicious anemia, aplastic anemia, granulocytopenia and the leuko-erythroblastic anemias. The sternal puncture, however, determines the diagnosis; it reveals a great preponderance of primitive myeloid cells, most frequently with a predominance of myeloblasts. In two cases evidence was found that the erythropoietic tissues shared in the hyperplasia.

Archives des Maladies du Cœur, Paris

32: 769-848 (Aug.) 1939. Partial Index

- *Vitamin B₁ Deficiency and Cardiopathies: II. Vitamin B₁ Deficiency in Pathogenesis of Cardiac Disturbances of Pregnancy. G. Bickel.—p. 769.
- The Lian-Minot. Electrocardiograph with Electrofluoroscopic Control. C. Lian and G. Minot.—p. 790.
- Importance of Precordial Derivations and of Proof of Exertion in Electrocardiographic Diagnosis of Angina Pectoris. G. Michaelides.—p. 808.

Vitamin B₁ and Cardiovascular Disorders of Pregnancy.—Bickel saw a secundigravida aged 33 in her sixth month of gestation. Anamnesis of her first pregnancy revealed pernicious vomiting, significant loss of weight, palpitation, dyspnea and edemas of the extremities. Similar symptoms characterized also the first half of her second pregnancy with loss of weight from 132, to about 103 pounds (60 to 47 Kg.), pulse 130 beats a minute, the liver overlapping by three fingerbreadths the edge of the ribs, white soft edemas halfway up the thighs, absence of knee jerk and heel reflex, violent pains and formication in the legs. The electrocardiogram disclosed a ventricular complex of low voltage in derivations 1 and 2 and an inverted T wave in derivations 2 and 3. Daily intravenous injections of 50 mg. of vitamin B₁ produced immediate curative effects. Acetonuria and the edemas disappeared after the third day. Restoration of appetite was rapid; the pains in the legs ceased and the electrocardiographic testimony indicated normal conditions. However, vitamin B₁ therapy, reduced to a weekly intravenous injection, was continued until shortly before fetal maturity. At this time the patient weighed 127 pounds (57.6 Kg.) and the x-ray examination of the thorax showed normal heart dimensions. She gave birth to a healthy child. According to the author, cardiovascular disturbances may appear during pregnancy in women who previously were entirely free from them. They are likely to appear in connection with pernicious vomiting or toxicosis of the liver and show a tendency to acidosis and polyneuritic symptoms. Such disturbances may be due, at least in certain cases, to a vitamin B₁ deficiency caused by the intra-uterine needs of the child and the upset of the mother's metabolism. The parenteral administration of vitamin B₁ effective in certain pregnancy polyneuritides is equally effective, the author finds, in certain pregnancy cardiopathies.

Presse Médicale, Paris

47: 1397-1412 (Oct. 11) 1939

- Postoperative Progressive Cutaneous Gangrene. P. Wilmoth.—p. 1397.
- Procaine Hydrochloride Infiltration of Stellate Ganglions in Nasal and Bronchial Asthma, Angina Pectoris and Several Other Syndromes of Neurosympathetic Instability. A. Malherbe.—p. 1398.
- *Continuous Drip Transfusion. A. Grimberg.—p. 1399.

Continuous Drip Transfusion.—Grimberg shows that blood transfusion by means of the continuous drip, a method that was first introduced by Marriott and Kekwick, has caused a radical revision in the earlier conception of blood transfusion. Because of the extreme slowness with which the blood is introduced, continuous drip transfusion permits the administration of much larger quantities of blood than did the customary technic. The average duration of the drip transfusion is twenty-nine hours, but it has been continued for as long as sixty hours; the average quantity of blood administered by the continuous drip is 2,700 cc., but as much as more than 6,000 cc. has been given at one time. A quantity of 100 cc. is regarded generally as the best hourly quantity of blood. The author describes the technic of the method and shows diagrams of the apparatus. Evaluating the anticoagulants, he expresses the opinion that heparin is superior to sodium citrate in drip transfusion. He also discusses the indications for this method of blood transfusion, pointing out that Marriott and Kekwick recommended drip transfusion only for the treatment of the various types of anemia, of those due to hemorrhage as well as of those due to toxic, infectious, hemolytic, aplastic and other causes. Other investigators, however, are of the opinion that the method deserves a more extensive application. The author thinks that the chief indication for the drop by drop blood transfusion is to restore in the patient a normal hemoglobin content, whatever may be the initial form of anemia. It is particularly indicated when severe anemia makes doubtful the success of a required operation.

Archivio per le Scienze Mediche, Turin

68: 395-488 (Oct.) 1939

- *Erythroblastic Anemia of Cooley's Type. A. Francaviglia.—p. 395.
- *Anatomy of Erythroblastic Anemia. F. Schiappoli.—p. 457.

Erythroblastic Anemia in Children.—Francaviglia reports five cases of erythroblastic anemia of Cooley's type in children ranging in age from 2 to 8 years. Two of the patients were brother and sister. The disease is of unknown etiology. It is familial and hereditary. As a rule it develops during early childhood. Clinically the disease is characterized by the development of more or less acute erythroblastic anemia, increase of the volume of the liver, spleen and heart and skeletal alterations. The somatic development of the patients is retarded. The face is of the Mongoloid, adenoid or Negroid types. In the cases reported by the author the disease developed during the first or second year of life. Acute erythroblastic anemia was of the hypochrome type, with anisocytosis, poikilocytosis and reticulocytosis. There was leukopenia. The number of normal erythrocytes was diminished. Immature erythrocytes were abundant in the blood. The resistance of the erythrocytes, both mature and immature, was increased in all cases. The erythropoiesis was increased (medullary hyperplasia) with predominant production of basophilic erythrocytes and reticulo-endothelioblasts. The main alterations of the bones, as shown by x-ray examination, were hypertrophic and structural changes of the cranial and facial bones, especially thickness of the diploe and striation of the cranial vault and a process of diffuse osteoporosis of the skeletal bones. A history of infection or parasitism, such as syphilis, tuberculosis, malaria or helminthiasis, did not exist in any of the patients. The author found that the resistance of the erythrocytes in the blood of the parent who transmits the disease as well as in the blood of the apparently normal brothers and sisters of the patients is increased. He also found that administration of a combined treatment of thyroid and liver extract and iron may prolong the life and improve the general condition of the patients who have atypical forms of the disease which follow a slow evolution.

Erythroblastic Anemia.—Schiappoli made an anatomopathologic study of two cadavers of children who died from erythroblastic anemia of Cooley's type. He found that the main alterations from the disease are (1) a process of general reabsorption of the bones with formation of new trabeculas, (2) diffuse hyperplasia of the reticulo-endothelial system, especially in the hemopoietic organs, and (3) hemolytic anemia, with increased medullary and extramedullary erythropoiesis. The author concludes that the disease is a hemo-osteopathy of unknown etiology, for the development of which constitution and familial predisposition are the main factors. The anatomopathologic aspects of the disease are proper. Moreover, the disease is not to be classified in any of the following groups: hemolytic jaundice, erythroleukemia, hematochromatosis and pure general hyperplasia of the reticulo-endothelial system.

Archiv für Kinderheilkunde, Stuttgart

118: 1-64 (Sept. 26) 1939. Partial Index

- Trypanocidal Substance in Serum in Scarlet Fever: Investigations on Partial Function of Liver in Children with Scarlet Fever. J. Ströder.—p. 1.
- Normocalcemic Tetany. A. Giegel.—p. 11.
- Value of Weltmann's Reaction During Childhood. S. Holik.—p. 13.
- Necessity of Cooperation of Pediatrician in Prophylaxis of Dental Decay During Childhood. L. Petrik.—p. 19.
- Pathogenesis of Glycogen Storage Disease. W. Goeters.—p. 26.
- *Etiology of Pemphigus. Ilse Markolf and H. Knauer.—p. 39.

Etiology of Pemphigus.—Markolf and Knauer say that cases of pemphigus neonatorum occur in which none of the known micro-organisms can be demonstrated. They recently observed an epidemic of especially severe cases of pemphigus, some of which presented the aspects of erythrodermia exfoliativa. Moreover, in older children there occur cases with mild general symptoms, which could perhaps be classified with dermatitis herpetiformis Dühring. Finally there are cases which greatly resemble pemphigus vulgaris in adults and some of which present the aspects of pemphigus foliaceus or pemphigus vegetans. The authors think that these various forms of pemphigus suggest that not all cases have the same cause. They decided to investigate whether a virus might perhaps play a part in pemphigus. In their search for virus bodies they employed several methods

give calcium salts for a long time, the effect being produced in a few hours. The author describes his observations on the effectiveness of a certain hemostatic preparation which he found ineffective in oral and only slightly effective in intramuscular injection. He also observed that the bleeding time is influenced neither by the oral nor by the intramuscular administration of calcium salts.

Acta Obstet. et Gynec. Scandinavica, Stockholm

19: 247-370 (No. 3) 1939. Partial Index

- Primary Ulcerous Pneumococcal Vaginitis. Gösta Leander.—p. 249.
Contribution to Diagnosis of Strangling Endometriosis in Sigmoid Colon, with Reference to Case Observed. H. Josefsson.—p. 256.
Abdominal Pregnancy: Case in Which Mature, Living Fetus Was Obtained by Operation. E. Bergenfeldt.—p. 272.
Hyperemesis Gravidarum. E. Schjött-Rivers.—p. 290.
*Clinical Experience with Estilbin. S. Felding and E. Møller-Christensen.—p. 337.
Radial Paralysis in the Newborn. E. Hauch and M. Ottsen.—p. 345.
*Prophylactic and Curative Effect of Vitamin K in Hemorrhagic Disease of the Newborn (Hypothrombinemia Haemorrhagica Neonatorum): Preliminary Report. K. K. Nygaard.—p. 361.

Clinical Experience with Diethylstilbestrol.—Felding and Møller-Christensen review reports on the biologic effect of diethylstilbestrol in rats and mice. It was observed that whereas 50 micrograms of diethylstilbestrol administered daily for ten days produced the characteristic aspects of uterine estrus in castrated rats, it was necessary to administer 100 micrograms of estrone for nineteen days to evoke the same reaction. However, on the mammae of castrated rats the effect of diethylstilbestrol proved to be only about one fifth that of estrone. On the hypophysis diethylstilbestrol had the same effect as estrone. They first give a tabulated report of the clinical histories of thirty patients with the symptoms which accompany the cessation of the ovarian function. The table gives the age of the patients, the dose, the frequency of the injections, the number of injections and the result of the treatment. As a rule a dose of 1 mg. was administered two or three times a week. In five cases the treatment was without result and in four it had to be abandoned after a few injections, as they caused nausea and vomiting. In the other twenty-five cases the result was clinically satisfactory. It was noted that as a rule the first signs of improvement appeared after the third or fourth injection. In a second table the authors present the histories of ten patients with uterine hypoplasia. In these cases the diethylstilbestrol was administered in the expectation that it might cause growth of the uterus. The size of the uterus was determined by vaginal exploration. In five cases no enlargement of the uterus could be demonstrated and in two of these the treatment had to be discontinued because diethylstilbestrol caused nausea and vomiting. In the other five cases the treatment was satisfactory, a distinct growth of the uterus being demonstrable. Since January the authors have treated fifteen other patients who had climacteric symptoms with injections of diethylstilbestrol. In all these cases the results were favorable, and nausea and vomiting was observed in none of them. The authors reach the conclusion that diethylstilbestrol may be regarded as on a par with estrone preparations. However, in about one sixth of the cases it caused nausea and vomiting, and in some instances these symptoms were so severe that treatment had to be suspended.

Vitamin K in Hemorrhagic Disease of the Newborn.—Nygaard reports sixty-six cases of hemorrhagic disease of the newborn which occurred among 9,748 newborn infants. The investigations were induced on the one hand by the observation of a physiologic transitory prolongation of the coagulation time of the blood during the first week of life and on the other hand by the fact that the coagulation time is prolonged in cases of hemorrhage and further by the fact that the hemorrhages of the newborn coincide with the period of transitory prolongation of the coagulation time. In view of recent observations that hemorrhages in cases of obstructive jaundice are preceded by a lowering of the prothrombin content of the blood, investigation was made whether the abnormal coagulation of the blood of the newborn could originate in a deficiency of prothrombin. If this was so it seemed reasonable to try the administration of vitamin K, which exerts an antihemorrhagic effect. For the determination of the prothrombin time the method of Quick was used. In order to determine the physiologic variation of pro-

thrombin during the first week of life, studies were made on thirty-one normal newborn infants. These studies indicated that a normal prothrombin time is maintained during the first ten hours after delivery but that a definite reduction of the prothrombin content becomes apparent during the second half of the first day. This low level is maintained during the following five days. From the sixth day prothrombin returns to the level found at the time of birth. Studies on the prothrombin content of some of the newborn infants with hemorrhage disclosed that in the majority of cases the onset of hemorrhage coincides with the period of transitory physiologic hypothrombinemia. Hemorrhages of the newborn generally occur when the physiologic hypothrombinemia exceeds that which is normally present at that time of life. This condition has been termed hypothrombinemia haemorrhagica neonatorum. Experiments with vitamin K revealed that the development of transitory hypothrombinemia apparently can be successfully prevented by the administration of vitamin K right after delivery. This may lead to effective prophylaxis of hypothrombinemia haemorrhagica neonatorum. Vitamin K administered to three patients with this type of hemorrhage exhibited a therapeutic effect equaling that of blood transfusion.

Acta Psychiatrica et Neurologica, Copenhagen

14: 395-647 (No. 3-4) 1939. Partial Index

- Cerebral Vasomotor Regulation: Method for Determination of Cerebral Control of Peripheral Circulation in Man. S. Christiansen, M. Fog and T. Vanggaard.—p. 413.
Clinical and Histopathologic Studies on Infantile Spinal Muscular Atrophy. F. Karlström and G. Wohlfart.—p. 453.
Syringomyelia and Cervical Ribs in Heterozygotic Twins. K. H. Krabbe.—p. 489.
Cranial Deformity and Syringomyelia: Three Cases. L. Laursen.—p. 509.
Ependymal Cysts in Third Cerebral Ventricle with Sudden Fatal Course. H. Marcus.—p. 527.
*Late Impairment of Spinal Cord in Curvature of Spinal Column, Especially in Those of Type of Scheuermann's Juvenile Kyphosis. G. Wretblad.—p. 617.

Scheuermann's Juvenile Kyphosis.—Wretblad points out that curvatures of the vertebral column, even those that are comparatively severe and those that develop within a comparatively short time, rarely cause severe medullary symptoms. It has been assumed that impairments of the spinal cord are entirely absent in cases of this type. Wretblad was able to observe changes in the spinal cord also in juvenile kyphosis (Scheuermann's kyphosis). He gives detailed histories of six cases, in all of which youths were involved who had performed hard physical labor; that is, they belonged to a group in which Scheuermann's kyphosis is especially frequent. An aspect that is typical of this form of kyphosis is that the development of the vertebral deformity is hardly noticed by the patient. This characteristic was observed in the described cases. Regarding the development of the medullary symptoms the author says that the patients generally observe the symptoms first on one side. In one of the reported cases the symptoms were restricted to one side for a year but then, in the course of a month, they developed with equal severity on the other side. In two cases the first symptoms were sensations of numbness and cold, but otherwise the dominating symptoms were weakness and lack of steadiness in the legs. In some of the cases weakness of the bladder or constipation developed. Examination revealed in one of the cases a mild spastic paraparesis and in the other cases a severe one which prevented walking entirely or almost entirely, also a reduction in sensitivity, the upper limits of which correspond to the medullary segment of the vertex of the kyphosis. Myelography indicated that at the vertex of the kyphosis there existed an obstruction in the circulation of the spinal fluid, in that the dura was probably pressed against the spinal cord. Opening of the dura counteracted this obstruction. Laminectomy and leaving the dura open produced favorable results in three cases in which the medullary symptoms were of a comparatively recent date. In another case, in which the medullary symptoms had existed for several years, death followed a short time after the operation and the necropsy revealed that irreparable medullary changes, caused by the kyphosis, had developed previous to the operation. The author thinks that it cannot be doubted that the kyphosis is the cause of the medullary symptoms. He cites factors in support of this contention.

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FATALITY RATES IN THE TREAT- MENT OF 998 ERYSIPELAS PATIENTS

THE INFLUENCE OF SULFANILAMIDE

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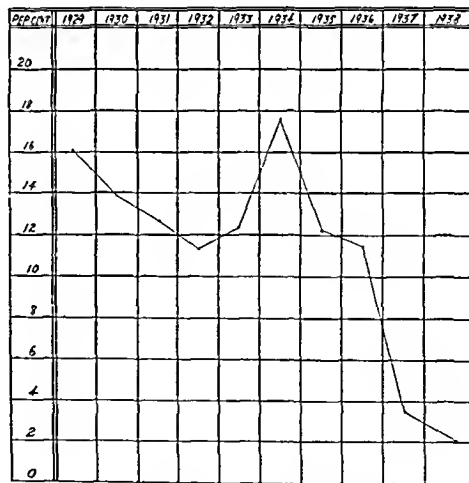
Hippocrates gave a fair description of erysipelas and Galen more closely defined it. Since then various forms of treatment have been as numerous as the centuries that have elapsed. That this disease cannot be ignored as a cause of death is shown in table 1. It may be noted that for the first year of the quinquennium, with 196 patients, the fatality rate was 17.3 per cent, whereas in 1938 among 141 patients the death rate was only 2.1 per cent. Even the last named figure, which includes those of all ages, is of sufficient significance to view with alarm patients in the two extremes of life when the death rates are highest. Surgical patients and those suffering from chronic diseases or conditions in which malnutrition is an important factor are also serious, because in such groups fatality rates are often very high. It is for these reasons that we believe that a reduction of 87.8 per cent in the mortality for erysipelas within a period of five years is an accomplishment worthy of mention.

In table 2 the patients are divided according to age and sex, the number of deaths for each of the age groups and by sex, and with the corresponding fatality rates. It may be noted that approximately 60 per cent were males and 40 per cent females. These proportions are in accord with common observation. Furthermore, it may be seen that the fatality rate for males is almost exactly double the corresponding rate for females, the precise figures being 12.1 per cent in the former instance and 6.3 per cent in the latter. In our total group of patients, fifty-three were under 1 year of age. It is at this period of life that fatal terminations often reach great heights, ranging from 50 per cent upward. Therefore we believe that our fatality rate of 37.3 per cent for this group is satisfactory. Here the question of sex is again of interest, for whereas the patients were almost equally divided in this respect there were 20 per cent more deaths among the males. The rate of 45.8 per cent among those over 76 years of age is not surprising. Although the latter group is small, comprising but fifteen patients with four times as many males as females, it is again noteworthy that there is a pre-

ponderance of deaths among the males when compared to the females, the ratio in this group being 7:1.

Table 3 is a summary of patients admitted to the hospital according to the seasons of the several years. This distribution fulfils usual expectations concerning the months in which erysipelas displays its high and low incidence. The higher trends of the disease in the spring and winter is clearly evident and the percentage of patients is approximately the same for these two seasons in each of the five years. Frequently in years past, however, it has been our experience that by far the greatest number of erysipelas patients were admitted to the hospital in March and April. Not only was the number of patients greater in the spring but most deaths occurred in this season.

The chart is a graphic representation of the trend of erysipelas mortality at the Cook County Hospital for the period 1929-1938. The sharp decline we believe is not altogether due to variations in the severity of this disease but is in fact attributable in a large measure to improved methods of treatment.



Comparative mortality, 1929-1938.

We have previously referred to the influence of age and sex on the prognosis of the average attack of erysipelas. Other factors affecting the outcome pertain to the site of infection, as is well known. In table 4 there will be found a division of our patients according to the manner of infection and the areas involved. The fact that so large a proportion of the patients are classified as unknown for the mode of infection is not surprising. One of the most frequent ports of infection is the nose, as a consequence of abrading the mucous membrane of the nostril by means of the finger nail. Likewise, in a similar manner the ear sometimes serves

as a port of entry when abraded by an exploring toothpick, match or fingernail. Under such circumstances the patient invariably denies a history of trauma. Furthermore, because of the accessibility of the nostrils, the ears and any portion of the face or even head, we find that such areas provide the soil for an attack of

TABLE 1.—All Cases by Years, 1934-1938

Year	Cases	Deaths	Per Cent
1934.....	196	34	17.3
1935.....	254	31	12.2
1936.....	262	23	11.3
1937.....	205	7	3.4
1938.....	141	3	2.1
Totals.....	998	98	9.8

TABLE 2.—Cases and Deaths According to Age Groups, 1934-1938

Ages, Years	Cases			Deaths			Fatality per Cent According to Age		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Under 1	29	24	53	12	8	20	41.3	33.3	37.3
1-5	29	23	52	1	0	1	3.4	0.0	1.7
6-15	15	16	31	1	0	1	6.6	0.0	3.3
16-25	22	37	59	2	1	3	9.0	2.7	5.8
26-35	32	42	94	1	0	1	1.9	0.0	0.9
36-45	115	77	192	12	2	14	10.4	2.5	6.4
46-55	169	84	253	11	3	14	6.5	3.5	5.0
56-65	125	73	198	22	6	28	17.6	8.2	12.9
66-75	34	17	51	4	4	8	11.7	23.5	17.6
76-86	12	3	15	7	1	8	58.3	33.3	45.8
Totals	602	366	998	73	25	98	12.1	6.3	9.8

TABLE 3.—Seasonal Distribution of Cases, 1934-1938

Year	Spring	Summer	Fall	Winter
1934.....	71	21	42	62
1935.....	92	29	48	85
1936.....	65	35	45	57
1937.....	72	15	32	86
1938.....	29	30	30	52
Totals.....	329	130	197	342
Fatal cases.....	32	8	27	31
Percentage of all cases, 5 year period.....	32.9	13.0	19.7	34.2
Fatality rates, percentage.....	9.7	6.1	13.7	9.0
Percentage of all deaths, 5 year period.....	32.6	8.1	27.5	31.6

erysipelas in more than 85 per cent of cases as a rule. In our own series the rate was 90.1 per cent. The incidence of facial erysipelas exclusive of other portions of the head was 86.6 per cent. There were but 7.4 per cent of all cases in which erysipelas primarily affected the extremities; the trunk was the original site of infection in 2.4 per cent.

Much could be written about the multiplicity of methods advised in the past for the treatment of erysipelas. Local applications, including heat, cold, ointments and mechanical measures such as elastic bandages and collodion bands have been used. Internal medications have embraced a great variety of drugs. There have been antistreptococcus serums and more recently erysipelas antitoxins. Whole blood, intramuscularly or intravenously, has been advocated. Convalescent human serum has also been recommended. Roentgen irradiation and ultraviolet rays have at times

been in the ascendancy. Various degrees of success have been reported irrespective of the therapy applied. In table 6 we have indicated the use of a number of the measures mentioned for the purpose of illustrating what may be anticipated in respect to recovery. Nevertheless we realize that many of these groups are too small to afford an accurate basis of conclusion in respect to efficiency or lack of therapeutic value for the remedies used.

Prior to the introduction of sulfanilamide, we believed that the use of ultraviolet rays was probably the most successful agency for treatment that had been followed in the Contagious Disease Department for many years past.

It may be seen at the end of table 6 that 162 patients were treated with sulfanilamide. Of that number 132 received such therapy during the year 1938. The status of these patients with regard to age and sex is set forth in tables previously referred to. The fatality rate for all admissions in 1938 was the lowest ever recorded in our experience (2.46 per cent) and is not confined to any single group. It includes all from infancy to

TABLE 4.—Manner of Infection and Area Involved

	Manner of Infection		Areas Involved			
	Post-operative	Trauma known	Face	Head Other than Face	Trunk	Extremities
1934.....	7	16	173	171	6	8
1935.....	13	25	216	222	0	8
1936.....	5	7	190	163	9	6
1937.....	7	25	173	195	6	2
1938.....	0	7	134	114	5	0
Totals.....	32	80	886	865	35	24
Percentage of all cases, 5 year period.....	3.2	8.0	88.7	86.6	3.5	2.4
Fatal cases.....	4	7	87	79	5	8
Fatality rate, percentage.....	12.5	8.7	9.8	9.1	14.2	33.3
Percentage of deaths, 5 year period.....	4.0	7.1	88.7	80.6	5.1	8.1

TABLE 5.—Contributory Causes and Complications of Erysipelas

Complication	Cases	Deaths	Fatality Rate, Percentage	Percentage of All Deaths, 5 Year Period
Diabetes.....	14	4	28.5	4.0
Nephritis.....	3	1	33.3	1.0
Bronchopneumonia.....	30	28	93.3	28.5
Skull fracture.....	4	1	25.0	1.0
Carcinoma of tongue.....	1	1	100.0	1.0
Organic heart disease.....	21	9	42.8	9.1
Syphilis of central nervous system.....	4	2	50.0	2.0
Cirrhosis of liver.....	5	3	60.0	3.0
Varicella.....	1	1	100.0	1.0
Septicemia.....	5	5	100.0	5.1
Peptic ulcer.....	1	1	100.0	1.0
Cavernous thromboses.....	1	1	100.0	1.0

old age and both surgical and those with debilitating diseases who are so commonly a prey to erysipelas. There are no fatal instances excluded from our statistics regardless of how soon death occurred after the patient entered the hospital.

We believe it a matter of interest to record the principal diseases and conditions which were present in our erysipelas patients. This has been done in table 5. Here

are listed not merely the complications which were contributory to a fatal termination but also diseases and conditions which were present prior to the attack of erysipelas and therefore greatly increased the hazards attending the illness. We have enumerated the respective totals, indicated the number of fatalities for each and shown fatality rates for the various groups in which pathologic conditions, not necessarily related to erysipelas, were present. The last column of table 5 shows the part played by the various complications or conditions in contributing to the total number of deaths. It is evident from the figures, as might be anticipated, that bronchopneumonia is the most important complication causing death and that those patients who suffer from organic heart disease prove to be unusually poor risks when subjected to attacks of erysipelas.

For 378 patients treated by Fox,³ the fatality rate was 9.52 per cent. The patients were divided into two groups, one being treated by serum and the other without serum. There was no significant difference in the fatality rates, which were 8.8 for the former and 9.7 for the latter.

More recently Snodgrass, Anderson and Renne⁴ described the treatment of 242 patients who were given sulfanilamide. Their fatality rate was only 2.06 per cent. It is rather interesting that the latter figure corresponds closely with our own group of 162 patients when sulfanilamide was used with a fatality rate of 2.46 per cent. These figures are particularly impressive to us when we consider the years 1929-1933. For that period 1,193 cases were reported by one of us⁵ with a fatality rate of 13.4 per cent at the Cook County

TABLE 6.—Treatment and Results, 1934-1938

Medication	Number of Cases					Total Cases	Average Hospital Days	Secondary Spread	Deaths	Percentage of Spread	Percentage of Fatalities
	1934	1935	1936	1937	1938						
Ultraviolet rays.....	131	190	74	82	0	477	7.95	63	52	14.2	10.9
Ultraviolet rays; cold magnesium sulfate.....	1	0	46	38	0	85	7.36	5	3	5.8	3.5
Ultraviolet rays; hot compresses.....	1	5	4	7	0	17	10.47	2	2	11.7	11.7
Ultraviolet rays; cold compresses.....	1	5	26	2	0	34	9.35	4	2	11.7	5.8
Ultraviolet rays; roentgen rays.....	1	0	0	0	0	1	12.00	0	0	0.0	0.0
Ultraviolet rays; prontosil.....	0	0	1	0	0	1	9.00	0	1	0.0	100.0
No treatment.....	8	16	6	17	2	49	5.38	0	3	0.0	16.3
Roentgen rays.....	2	0	0	0	0	2	11.00	0	1	0.0	50.0
Cold compresses.....	11	14	18	1	0	44	8.13	3	1	6.8	2.2
Hot compresses.....	1	6	6	4	0	17	8.23	0	3	0.0	17.6
Cold magnesium sulfate.....	1	1	14	17	0	33	8.00	0	2	0.0	6.0
Cold magnesium sulfate; collodion band; ultraviolet rays.....	0	0	1	0	0	1	11.00	0	1	0.0	100.0
Cold magnesium sulfate; hot compresses; ultraviolet rays.....	0	0	2	0	0	2	13.00	0	0	0.0	0.0
Cold magnesium sulfate; collodion band.....	0	0	1	0	0	1	5.00	0	0	0.0	0.0
Convalescent serum.....	4	12	0	0	1	17	9.05	0	3	0.0	14.6
Convalescent serum; ultraviolet rays.....	0	2	0	2	0	4	13.50	3	2	75.0	50.0
Convalescent serum; cold compresses.....	2	0	0	1	0	3	7.53	0	0	0.0	0.0
Antivirus cream.....	13	1	1	0	0	15	7.20	4	4	26.6	26.6
Antivirus cream; ultraviolet rays.....	5	1	0	2	0	8	9.87	2	4	25.0	25.0
Antivirus cream; cold compresses.....	4	0	0	0	0	4	11.50	0	0	0.0	0.0
Antivirus cream; convalescent serum.....	1	0	0	0	0	1	7.00	0	1	0.0	100.0
Collodion band.....	1	0	0	0	0	1	7.00	0	1	0.0	100.0
Collodion band; ultraviolet rays.....	1	0	0	2	0	3	10.00	1	0	33.3	0.0
Collodion band; antivirus cream.....	0	1	0	0	0	1	19.00	1	0	100.0	0.0
Erysipelas antitoxin (Amp. 1).....	2	0	0	0	0	2	4.50	0	1	0.0	50.0
Erysipelas antitoxin; convalescent serum (Amp. 3) 40-80 cc.....	4	0	0	0	0	4	8.50	1	1	25.0	25.0
Erysipelas antitoxin; ultraviolet rays.....	1	0	0	0	0	1	2.00	0	0	0.0	0.0
Cold compresses; antivirus cream; ultraviolet rays.....	0	0	2	0	0	2	6.50	0	1	0.0	50.0
Sulfanilamide; cold compresses.....	0	0	0	0	3	3	11.66	0	0	0.0	0.0
Prontyllin; hot compresses.....	0	0	0	0	3	3	6.33	0	0	0.0	0.0
Prontyllin.....	0	0	0	30	132	162	6.55	0	4	0.0	2.46

COMMENT

In 1930 Ude and Platon¹ reported on the treatment of 402 erysipelas patients, who were divided into six groups according to the method of treatment adopted. Fatality rates for the respective groups varied from 23.8 to 7.6 per cent. Magnesium sulfate locally, roentgen irradiation, ultraviolet irradiation and erysipelas antitoxin constituted the chief form of therapy in each of four groups; in the remaining two groups combined forms of therapy were used. Their lowest fatality rate was attained by the employment of ultraviolet rays.

Symmers and Lewis,² reporting on the treatment of 4,698 patients with erysipelas antitoxin, had a fatality rate of 7.2 per cent.

Hospital. Consequently, it is our conclusion that sulfanilamide is the most effective form of therapy thus far used in the treatment of erysipelas.

25 East Washington Street.

3. Fox, M. J.: The Treatment of Erysipelas, Wisconsin M. J. **36**: 528-534 (July) 1937.

4. Snodgrass, W. R.; Anderson, Thomas, and Renne, J. L.: Sulfanilamide in the Treatment of Erysipelas, Brit. M. J. **2**: 399-403 (Aug. 20) 1938.

5. Hoyne, A. L.: Erysipelas: Some Observations Regarding 1,193 Cases, M. Rec. **141**: 132 (Feb. 6) 1935.

Relation of Physiology to Medicine.—The obligations of physiology to medicine are twofold: to teach the student bent on the practice of medicine the normal functions of the human body, and in doing so to train him as an accurate observer and thinker; and to lay a foundation upon which the house of medical science shall erect itself. If you will, you may weld the two together and say that in its relation to medicine the function of physiology is to gather, classify, and spread knowledge and methods of studying the normal functions of the animal body.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

1. Ude, W. H., and Platon, E. S.: Erysipelas: A Comparative Study of the More Recent Methods of Treatment, J. A. M. A. **95**: 1-4 (July 5) 1930.

2. Symmers, Douglas, and Lewis, K. M.: The Antitoxin Treatment of Erysipelas, with Observations on 4,698 Patients so Treated, M. Clin. North America **18**: 861-866 (Nov.) 1934.

SURGICAL ASPECTS OF CARCINOMA
OF THE LARGE BOWEL

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Well informed surgeons today have learned much about carcinoma of the colon and rectum. They know that the disease is often curable but that delayed diagnosis forces almost one half of the victims to seek surgical help in an incurable state. They have been taught the importance of certain characteristic symptoms which at once arouse suspicions demanding thorough investigation. In addition they know from precept, if not from experience, the essential value of abdominal and especially of rectal palpation, of proctoscopy and of sigmoidoscopy. Furthermore, they appreciate the accuracy of diagnosis of the colonic lesions which is possible in the hands of efficient roentgenologists and acknowledge the great contribution which roentgenology has made toward early diagnosis. With these concepts firmly in mind, modern surgeons are profoundly interested in the practical surgical approach and it is to such a consideration that these remarks are addressed.

TABLE 1.—Carcinoma of Large Intestine: Operability Rate

	Cases	Resections	Operability
Right.....	25	21	84.0%
Transverse.....	18	14	77.7%
Left.....	88	62	70.4%
Rectum.....	102	69	67.6%
Total.....	233	166	71.2%

The group of 233 cases on which the accompanying statistics are based represents patients operated on by the authors over an eighteen year period in four hospitals and drawn largely from the private practice of the senior author. These statistics correspond in general with those from other clinics, and while the group of cases is not large enough for conclusive evidence it does serve to focus attention on certain specific principles which we desire to emphasize.

OPERABILITY

Operability rates depend on many factors and may reflect both the type of patients in a given series and the attitude of the operator toward radical resection. An extension of operability will necessarily result in a higher mortality rate, but mortality rates in cancer surgery should be viewed with a less critical eye than mortality rates in nonfatal diseases. As Dr. J. M. T. Finney has so often remarked, exploration in these cases represents "the last call." The patient must be given his chance, and indeed he is usually glad to take his chance, if it is a reasonable one. Our operability rate over the years, based on the percentage of resections in the cases in which operation was performed, has been 71.2 per cent (table 1). It is interesting to note that it has been highest for the tumors on the right side and has gradually decreased as successive portions of the large intestine are considered. Thus the percentage of operability for the right colon is 84, for the transverse colon 77.7, for the left colon 70.4 and for the rectum 67.6.

In the presence of demonstrable visceral or peritoneal metastases it is often justifiable, and indeed good judgment, to remove an operable obstructing lesion. This practice has enabled a number of patients to live comfortably for periods of two and three years before succumbing to the disease. In other instances, however, there has been disappointment when local recurrence with obstruction has supervened in a few months.

In a number of cases it has not been possible to ascertain at once the operability of a given tumor without first making a careful, discreet beginning of resection. In this way several growths which at first inspection and palpation would necessarily be considered inoperable have finally been found removable. On the other hand it has as often been necessary to withdraw when the operator was convinced that further attempts at extirpation were unwise.

THE INOPERABLE CASE

Statistics generally, including our own, show a slightly higher mortality rate for simple exploratory or palliative procedures than they do for the resections (table 2). Nevertheless, in the presence of an inoperable obstructing lesion the surgeon who would do what he can to prolong his patient's life is confronted with the necessity of performing some palliative operation. The choice is likely to be either a short-circuiting anastomosis, a colostomy or, in the case of a low rectal growth, local destruction of the lesion. The latter procedure has been carried out at times with the curet, the actual cautery or the desiccating current. Such desiccation or diathermy applied to a frank carcinoma should, in our opinion, be limited to inoperable growths and not used as the procedure of choice, as has at times been advocated. A strange exception appears in this series when it is shown that thirty-three exploratory or palliative operations in connection with rectal cancers were performed without a hospital death.

For the inoperable low sigmoid or rectal growth which at the time of exploration is not obstructing, one of us (H. B. S.) has advocated and practiced for many years a procedure termed precolostomy.¹ A knuckle of sigmoid proximal to the growth is brought out through a short left McBurney incision and sutured to the skin. This maneuver need not interfere with the fecal flow but is in effect the first stage of a sigmoidostomy. The second stage, consisting of an incision in the intestinal wall, can be performed in the near or distant future, when necessity dictates, or may never need to be done at all.

In the presence of an inoperable tumor and more especially in the presence of a recurrence, irradiation is often helpful. Adequate roentgen therapy and the implantation of radium or radon may contribute much to the patient's comfort.

PREOPERATIVE MEASURES

It is a fortunate fact that the majority of patients present themselves in a condition which permits preoperative preparation. Two complications, however, may require prompt operation and indeed may so obscure the diagnosis as to make it clear only when exploration has been carried out. The first of these, acute obstruction, occurred ten times in our series, while the second, perforation accompanied by abscess formation, occurred six times. Of these sixteen patients, five died after the primary procedure and one after the second stage of resection. Among other serious com-

Read before the Section on Surgery, General and Abdominal, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Stone, H. B.: Precolostomy for Inoperable Carcinoma of the Rectum and Lower Sigmoid, *Am. J. Surg.* 20: 355 (May) 1933.

plications which may exist are anemia, dehydration and dietary deficiency states. The indication is clear to correct these complications by appropriate means as far as one is able.

Partial intestinal obstruction represents the major problem to be solved before the patient is fit for the removal of his growth. It is our firm belief that in the majority of cases the bowel can be safely and satisfactorily decompressed and cleansed without recourse to any sort of enterostomy. To obtain such a cleansing, a week or longer must be allowed and a definite regimen must be followed. Our practice has been to prescribe a daily saline cathartic, a daily cleansing enema, liquid petrolatum and a high carbohydrate, low residue diet. Should it appear after a reasonable interval, however, that these or similar measures have been ineffective and that the patient continues to exhibit signs of partial obstruction, surgical drainage of a proximal segment should be carried out.

In addition to acute obstruction of the intestine, to perforation of the growth and to ineffective conservative measures, preliminary drainage of the bowel may also be called for with patients who are poor risks by reason of age or of associated diseases. This is especially true of tumors of the right half of the colon, in which the drainage may consist of an ileocolostomy, thereby completing the anastomosis feature of the resection. While in no sense criticizing others who use preliminary drainage as a routine procedure, we are convinced that it should be reserved for special indications and we predict

some type of preliminary bowel drainage and that in three of the eleven drainage was done elsewhere.

We have had no experience with intraperitoneal vaccination and do not believe at this time that the evidence is conclusive enough to warrant its adoption. The reports, however, are being followed with deep interest.

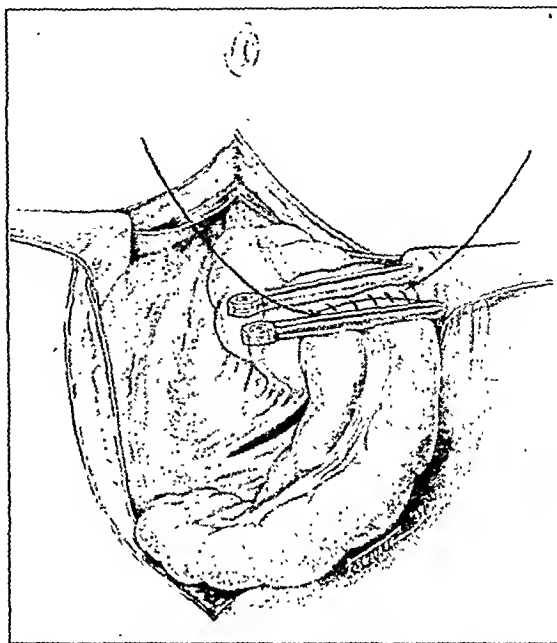


Fig. 2.—The diseased segment has been removed and the ends of the bowel are being brought together for anastomosis. The posterior layer of continuous silk has been laid. The handles are omitted for the sake of clarity.

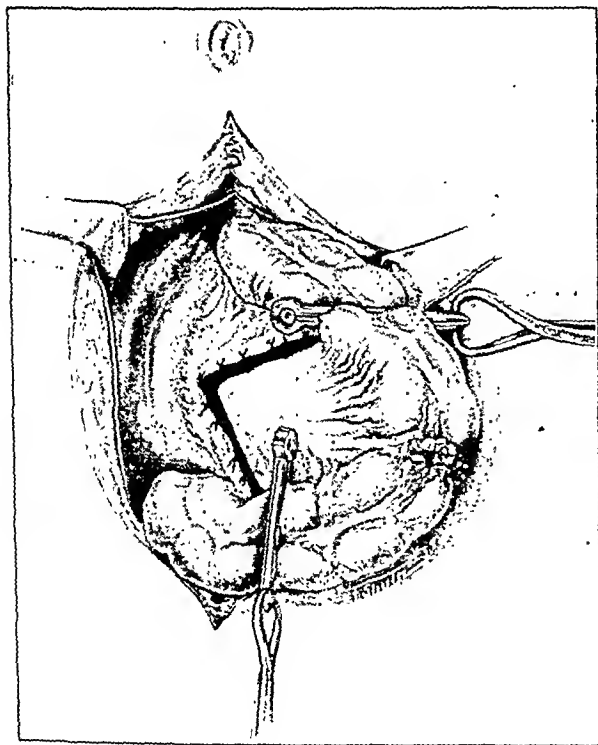


Fig. 1.—Resection of the sigmoid colon and aseptic end to end anastomosis. Stone clamps being used. The growth with a generous margin of intestine and with adjacent mesentery is about to be resected. The handle of each clamp secures the blades in their closed position. Two other clamps are to be placed on the ends of the segment to be resected.

that experienced operators will use it with less frequency in the future. The preference for one stage operations in this series is clearly demonstrated when it is shown that only eleven of the 166 resections were preceded by

The surgeon must employ the kind of anesthesia which he has found most satisfactory for abdominal surgery of this type. Just as it is the man behind the splint that counts, so it is the person administering the anesthetic who is of prime importance. The preference in these cases has been for general anesthesia, usually gas-oxygen and ether, and more recently cyclopropane preceded by a basal anesthetic of the barbituric acid series.

OPERATION

The ideal operation for malignant lesions of this area has been well defined by Dixon² as "one in which complete removal of the growth is accomplished, normal function is preserved or restored, and recovery is effected." We should like to supplement this statement of sound principles by adding that the ideal operation also is one which assures the earliest recovery of the patient compatible with safety and affords a minimum of pain and discomfort.

In selecting the type of procedure for lesions in the colon, the principle generally adhered to in this series of cases has been aseptic end to end anastomosis following an adequate resection of the growth and its adjacent mesentery. Rankin's obstructive resection³ has been employed a number of times, however, as have open anastomoses, end to end, side to side and end to side. Allen⁴ has given a clear statement of the important points to be observed in performing an anastomosis and has emphasized the advantages of an

2. Dixon, C. F.: Collected Papers of the Mayo Clinic 23: 317, 1931.
3. Rankin, F. W.: Resection and Obstruction of the Colon (Obstructive Resection), Surg., Gynec. & Obst. 50: 594 (March) 1930.
4. Allen, A. W.: Right Colectomy for Malignant Disease, J. A. M. A. 109: 923 (Sept. 18) 1937.

aseptic type of union. While the open type may under certain circumstances be easier, and while in the lateral variety there may theoretically be less danger to the blood supply of the intestinal wall, still we believe that the advantage in avoiding the probability of contamination makes aseptic end to end anastomosis more desir-

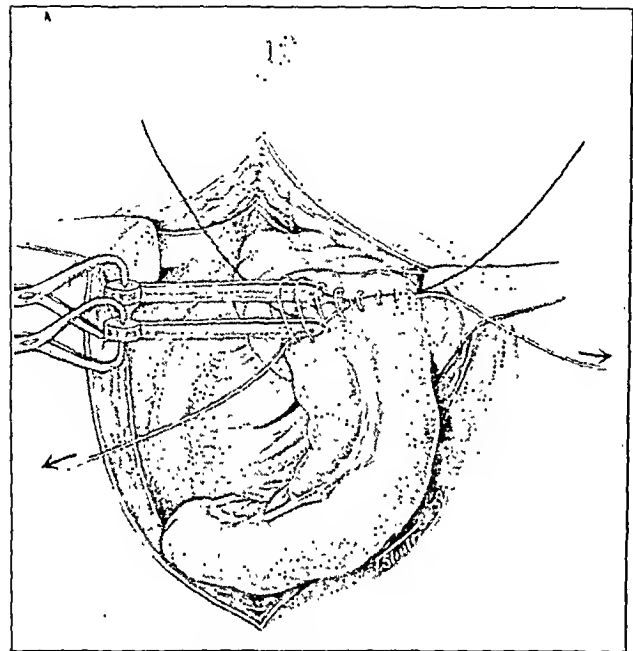


Fig. 3.—The anterior layer of No. 0 chromic catgut has been placed and the handles have been transferred to the opposite ends of the clamps. The clamps which have been released are being withdrawn together, while an assistant makes traction on the ends of the anterior suture. Actually, the cut ends of the intestine in the clamps should face each other and should be closer together.

able. In our own experience, seventy-one cases of aseptic anastomosis of the Parker-Kerr or clamp type yielded a mortality of 11.2 per cent, while nineteen cases of open anastomosis yielded a mortality of 26.3 per

TABLE 2.—Carcinoma of Large Intestine: Comparison of Types of Operation

	Cases	Deaths	Mortality
Exploratory or palliative.....	67	12	17.9%
vs.			
Resections.....	106	23	13.8%
Aseptic anastomoses.....	71	8	11.2%
vs.			
Open anastomoses.....	19	5	26.3%
One stage resections.....	151	22	14.5%
vs.			
Two stage resections.....	15	1	6.6%

cent (table 2). It is true that a number of the latter failures were instances of difficult, low sigmoid growths in which a "tube anastomosis" was done in an effort to utilize a short rectal stump and avoid colostomy. As a result we believe that, unless an aseptic type of anastomosis can be satisfactorily performed at this low level, no open type should be attempted. Instead, a permanent colostomy should be made.

As a method of performing aseptic end to end anastomosis, we have been using for almost three years a special set of clamps described elsewhere.⁵ These clamps are characterized by their narrow blades and detachable handles. The detailed technic of their use

5. Stone, H. B.: Method of Intestinal Anastomosis with New Clamp, Surg., Gynec. & Obst. 65: 383 (Sept.) 1937.

has been given by Owings and Stone.⁶ Within the past two years at the Baltimore City Hospitals there have been performed fifteen consecutive one stage resections of the sigmoid utilizing this technic. The cases have all been done by the resident staff and there have been no deaths.

Mayo and Simpson⁷ have recently advocated resection and primary anastomosis in the transverse colon and have presented thirty-six cases with an 11.1 per cent mortality for comparison with ninety-five cases of extraperitoneal resection having a mortality rate of 20 per cent. They emphasize the important secondary considerations of avoiding repeated operations and long hospitalization.

TABLE 3.—Carcinoma of the Rectum: Resection Procedures

	Cases	Deaths	Mortality
Excision malignant polyps.....	9	1	11.1%
Perineal excision.....	18	1	5.5%
One stage abdominoperineal.....	42	7	16.6%
Total resections.....	69	9	13.0%

Concomitant decompression in the absence of preliminary drainage is practiced as a routine by many surgeons in the case of a primary anastomosis. It has not been performed in this group of colon cases and our conclusion on reviewing the data is that it should be used more frequently. In low sigmoid anastomoses, however, it has been the practice to introduce a rectal tube and pass the tip several inches proximal to the anastomosis, thereby giving drainage to the proximal segment.

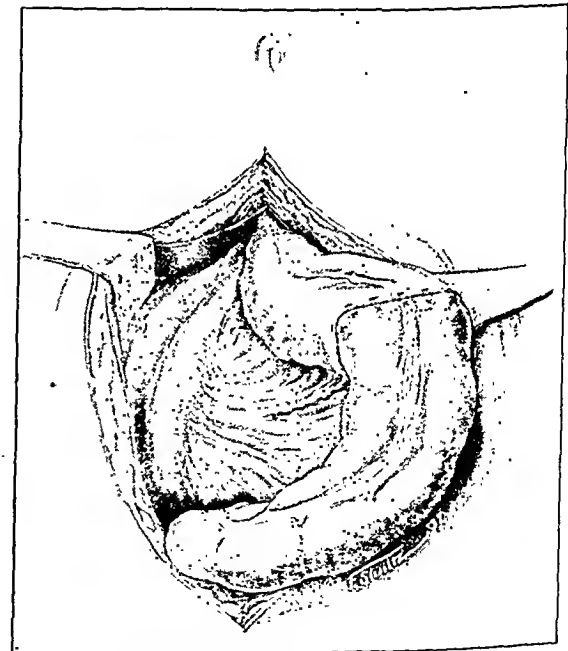


Fig. 4.—The anastomosis is completed by laying a row of mattress sutures of silk, which serve also to invert the original knots. The rent in the mesentery is closed.

In considering the management of malignant growths in the rectum, one of the most perplexing problems is that of the solitary, sessile polyp having malignant characteristics. If grossly and microscopically there is

6. Owings, J. C., and Stone, H. B.: Technic of Anastomosis Using the Stone Clamp, Surg., Gynec. & Obst. 68: 95 (Jan.) 1939.
7. Mayo, C. W., and Simpson, W. C.: Surgical Procedures for Carcinoma of the Transverse Colon, Ann. Surg. 109: 430 (March) 1939.

no invasion of the muscularis mucosae, our policy is to be content for the time being with local excision. The patient is carefully observed and, if there is evidence of recurrence of the polyp, excision is again performed. When histologic evidence is present that epithelial proliferation has invaded the rectal wall, a diagnosis of rectal cancer is made and the appropriate treatment instituted. Of nine instances of malignant polyps, one patient, followed for nine years, has had three recurrences at the site of excision, none of them invading the rectal wall. He is now well, without evidence of disease. Two other patients have required radical excision of the rectum.

The classic work of Miles,⁸ in our opinion, still forms the basis of logical attack on rectal cancer. Although the work of Brown and Warren⁹ indicates that visceral metastases depend largely on blood vascular invasion by tumor cells, the evidence from Gilchrist and David¹⁰ that lymphatic nodes may be secondarily involved without showing gross change strongly supports the principle that radical removal of lymphatic structures must not be compromised. This leaves the combined abdominoperineal operation as the procedure of choice for the properly selected case. Various modifications of the original operation have been perfected and described by D. F. Jones,¹¹ Rankin,¹² Lahey,¹³ Lahey and Cattell,¹⁴ T. E. Jones,¹⁵ Babcock,¹⁶ and others. Perineal resection of a low lying growth, with or without colostomy, sacrifices something in leaving behind potentially involved lymphatics but offers a less radical operation for the patient who is a poor risk. The surgeon must have a variety of procedures available.

The preference throughout this series has been for one stage abdominoperineal resection (table 3). In 1937, twenty-nine consecutive cases were reported¹⁷ with a hospital mortality rate of 10.3 per cent. These are included in the present total of forty-two cases with a mortality rate of 16.6 per cent. This higher figure represents the extension of the operation to include several bad risk patients with a resulting elevation of

ing the perineal part of the combined operation, the dorsal lithotomy position has been employed and only rarely has the coccyx been excised.

POSTOPERATIVE CARE

Either during or immediately following a resection of the large bowel, the patient should receive as a routine procedure a transfusion of blood. Other intravenous fluids should be given in large enough amounts to insure an adequate urinary output, as suggested by

TABLE 5.—Carcinoma of Large Intestine: Causes of Death

	Cases
Directly related to operative procedure:	
Peritonitis.....	11
Intestinal obstruction.....	2
Indirectly related to operative procedure:	
Cardiac failure.....	4
Pneumonia.....	2
Embolism.....	2
Diabetes.....	1
Cerebral hemorrhage.....	1
Total.....	23

Maddock and Collier.¹⁸ Conscientious care on the part of the surgeon and his hospital organization can do much toward avoiding and lessening the threatened complications. Shock and infection as well as cardiovascular, pulmonary and urinary complications may be expected and if they appear should be treated promptly. Aluminum paste¹⁹ on the skin has proved a great help in preventing irritation from fecal drainage in the early weeks. Instruction on the part of the surgeon is necessary in helping the patient to care for his colostomy.²⁰ Only by sending out patients properly trained in managing their colostomies will it be possible to dispel the ordinarily unjustifiable fear of colostomy which is held by many physicians as well as by the public at large.

CAUSE OF DEATH

Among the 166 resections there were twenty-three deaths, or a mortality rate of 13.8 per cent. In the small group of fifteen two stage operations there was only one death, a rate of 6⅔ per cent, while in 151 one stage cases there were twenty-two deaths, or a rate of 14.5 per cent. In sixty-three cases of one stage colonic resection completed with an aseptic anastomosis there were eight deaths, or a mortality of 12.6 per cent.

In considering the twenty-three fatalities associated with resection, thirteen, or 56.5 per cent, of these fatalities can be directly attributable to the operative procedure, there being eleven cases of peritonitis and two cases of intestinal obstruction (table 5). The remaining ten cases were due to cardiovascular, pulmonary, cerebral or diabetic complications. The incidence of peritonitis stresses to us the importance of an aseptic type of anastomosis, because many of these deaths occurred in the open type, and stresses the importance of more frequent employment of concomitant bowel drainage.

SUMMARY AND CONCLUSIONS

Modern surgeons, who are well informed with regard to symptoms and diagnosis of carcinoma of the colon and rectum, are especially interested in the practical surgical approach.

18. Maddock, W. G., and Collier, F. A.: Water Balance in Surgery, J. A. M. A. 108:1 (Jan. 2) 1937.

19. McLanahan, Samuel: Aluminum Paste and Skin Protection in Enterostomy, J. A. M. A. 108:385 (Jan. 30) 1937.

20. Cattell, R. B.: The Management of Colostomy, S. Clin. North America 18:755 (June) 1938.

TABLE 4.—Carcinoma of Large Intestine: Mortality of Resection

	Resections	Deaths	Mortality
Right.....	21	3	14.2%
Transverse.....	14	1	7.1%
Left.....	62	10	16.1%
Rectum.....	69	9	13.0%
Total.....	166	23	13.8%

mortality. There have been eighteen perineal resections of the rectum with one death, or a mortality rate of 5.5 per cent. In all the perineal procedures, includ-

8. Miles, W. E.: Method for Performing Abdominoperineal Excision for Carcinoma of the Rectum and of the Terminal Portion of the Pelvic Colon, Lancet 2:1812, 1908.

9. Brown, C. C., and Warren, Shields: Visceral Metastasis from Rectal Carcinoma, Surg., Gynec. & Obst. 66:611 (March) 1938.

10. Gilchrist, R. K., and David, V. C.: Lymphatic Spread of Carcinoma of Rectum, Ann. Surg. 108:621 (Oct.) 1938.

11. Jones, D. F.: A Two Stage Combined Abdominosacral Operation for Carcinoma of the Rectum, J. A. M. A. 65:757 (Aug. 28) 1915.

12. Rankin, F. W.: Graded Perineo-Abdominal Resection of the Rectum and Rectosigmoid, Am. J. Surg. 27:214 (Feb.) 1935.

13. Lahey, F. H.: Two Stage Abdominoperineal Removal of Cancer of the Rectum, Surg., Gynec. & Obst. 51:692 (Nov.) 1930.

14. Lahey, F. H., and Cattell, R. B.: Two Stage Abdominoperineal Resection of the Rectum and Rectosigmoid for Carcinoma, Am. J. Surg. 27:201 (Feb.) 1935.

15. Jones, T. E.: The Treatment of Cancer of the Colon, Surg., Gynec. & Obst. 62:415 (Feb., No. 2 A) 1936.

16. Babcock, W. W.: The Operative Treatment of Carcinoma of the Rectosigmoid with Methods for the Elimination of Colostomy, Surg., Gynec. & Obst. 55:627 (Nov.) 1932.

17. McLanahan, Samuel: One Stage Abdominoperineal Resection for Carcinoma of the Rectum, South. M. J. 30:382 (April) 1937.

Operability rates affect mortality rates, but the latter must not be viewed too critically in cancer surgery. Our own operability rate for the large intestine has been 71.2 per cent.

It is often justifiable to remove an operable obstructing lesion in the presence of visceral metastases. Before the operability of a tumor can be determined finally, it may be necessary occasionally to make a careful, discreet beginning of resection.

In addition to the usual palliative procedures for an inoperable tumor, precolostomy has been used frequently for low sigmoid or rectal growths, thereby obviating in many cases the immediate formation of a fecal fistula.

The intestine can be cleansed safely and satisfactorily in the majority of cases without recourse to any sort of preliminary enterostomy. Acute obstruction, perforation, ineffective conservative measures, age and associated diseases, however, may be indications for preliminary surgical drainage of the bowel and a two stage procedure. A one stage operation has been preferred whenever possible in this series.

While a variety of procedures are available for the colon, aseptic end to end anastomosis following an adequate resection has been the operation of choice. Seventy-one such cases yielded a mortality of 11.2 per cent. Concomitant decompression in the absence of preliminary drainage should be employed occasionally.

Local excision of a solitary malignant rectal polyp not invading the rectal wall is sufficient, provided careful observation of the patient follows. Radical operation should be performed if and when invasion of the rectal wall is determined.

Abdominoperineal resection is the logical operation for carcinoma of the rectum and in this series has been carried out in one stage. Perineal resection has been used for low growths in patients who are poor risks. Instruction of the patient by his surgeon with regard to the care of his colostomy is of the utmost importance.

While only 56 per cent of the deaths are directly attributable to the operative procedure, the incidence of peritonitis is high enough to stress the importance of an aseptic type of anastomosis and the desirability for more frequent employment of concomitant bowel drainage.

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ABSTRACT OF DISCUSSION

DR. JAMES D. RIVES, New Orleans: Three features strike me as being noteworthy: first, the large percentage of radical operations, which I think it fair to credit largely to the high level of intelligence among the professional friends and the clientele of the authors. The frequency of radical operations in my practice is less than 50 per cent; second, the high frequency of resection with primary anastomosis, which must be credited to their supreme confidence in their operative methods; and, third, the low operative mortality, which justifies that confidence. I have believed that for most surgeons multiple stage operations are safer and that this is particularly true of obstructive resections. Proximal decompression adds materially to the safety of resection with primary anastomosis of the left half of the colon even when no obstruction exists. However, the brief period of disability and the much greater comfort of patients who have had a one stage operation have a strong appeal, and there is no doubt if the mortality is not excessive that this type of procedure is preferable. The results reported by Drs. Stone and McLanahan are at least as good as those I get with multiple stage operations, and for some time I have been attempting to follow their lead. The preoperative preparation is of paramount importance. If the intestine is properly prepared and a careful technic employed, the minimal amount of peritoneal soiling that occurs, even in an open anastomosis, is quite unlikely to cause general peritonitis or even local abscess formation. There is, however, great danger that such soiling may produce a severe or even fatal anaerobic infection of the wound. Aseptic anastomosis is therefore desirable. The technic reported by Drs. Stone and Owings, with the clamp devised by Dr. Stone, is a most satisfactory method in my hands. However, I want to emphasize the fact that the result depends less on the method used than on the manner of its execution. The greatest danger of primary anastomosis is peritonitis, and this results usually not from contamination during the operation but from subsequent leakage at the suture line. This may result from a number of different causes, among which avitaminosis and plasma protein deficiency are probably prominent. Technical difficulties have impressed me most. Obviously the suture line must be gas and water tight, which requires very careful suturing when no through and through suture is placed on the wound margins. If, as the mesentery is dissected during removal of the enlarged nodes, the main vessels are traumatized, thrombosis may occur with gangrene, perforation and death.

DR. LELAND S. MCKITTRICK, Boston: One cannot but be tremendously impressed with the report of so high an operability and so low a mortality. It is difficult to take issue with so excellent a report. On the other hand, not all of us have had the experience of the authors and must depend on the procedures that are safest in the hands of the average surgeon. I have looked up our cases at the Massachusetts General Hospital, where the operations are done not by one or two men but by a large group of well trained surgeons. Prior to 1932 most of the resections of the right colon were done in one stage, probably because of the influence of the late Dr. D. F. Jones, who did most if not all these operations in one stage. In forty consecutive colectomies on the right side prior to 1932, thirty-seven were done in one stage with a mortality of 30 per cent. There were no deaths resulting from the three two stage operations. These forty cases represented 49 per cent of all the cases seen. Since 1932, largely through the influence of Dr. A. W. Allen, many more two stage colectomies on the right side have been done. Of the thirty-eight operations done during the past seven years, twenty have been done in one stage, still with a mortality of 30 per cent. The remaining eighteen have been two stage operations, with a mortality of 22 per cent. It is of significance, however, that not only is the mortality in the two stage group lower but the operability during the past seven years has been 71 per cent rather than 49 per cent, as in the preceding period. It would seem, therefore, that by doing the operation in two stages rather than in one the surgeons at the Massachusetts General Hospital can operate on a higher percentage of patients with carcinoma of the right colon with a lower operative mortality. I know that I can successfully remove the right colon in poor risk patients by doing a preliminary lateral anastomosis between the terminal ileum and the transverse colon and then at a second stage removing the intervening bowel, whereas if I attempted to do the resection in one stage certain of these patients would die. The thing that bothers me, however, is this: Because I can more safely operate on poor risk patients in two stages, does it follow that the younger good risk patients with no obstruction can also be operated on more safely in two stages than in one? Of this I am not convinced. I still do a certain number of one stage operations because I believe that the operation in one stage holds certain advantages over the two stage procedure, but I select these patients very carefully.

DR. HENRY K. RANSOM, Ann Arbor, Mich.: I recently reviewed the records of patients with carcinoma of the colon treated at the University Hospital during the past ten years, being particularly interested in the results of treatment of carcinoma of the right colon. A variety of operative procedures were employed. The operative mortality for right hemicolectomy was high. When these cases were considered according to the type of operation performed, (1) the one

stage operation with resection and primary suture anastomosis, (2) the modified Mikulicz procedure or obstructive resection and (3) the two stage operation consisting of preliminary ileocolostomy, with resection of the right colon at a second stage some three weeks later, a rather striking difference in operative mortality was noted. In the majority of cases a one stage operation was performed, and this procedure was attended with the highest mortality. The group of patients treated by obstructive resection was considerably smaller and therefore these statistics are less valuable. However, the mortality in this group was almost as high as in the one stage group. On the other hand, in a small number of cases dealt with by the two stage operation the operative mortality was approximately only one half. We decided to utilize the two stage operation more or less as a routine, and during the past few months seven right hemicolectomies for carcinoma have been done by this method. All the patients have had a satisfactory convalescence and there were no deaths. In the past an important argument in favor of the two stage operation has been the assumption that the first stage provides the peritoneum with increased resistance to infection so that the second stage may be done more safely. Our experimental results showed that, while a preliminary operation such as an intestinal anastomosis or colostomy does confer a certain degree of immunity to infection on the peritoneum, the amount of protection thus afforded is relatively slight and does not constitute an important argument in favor of the two stage procedure. While the application of the results of experimental surgery to the human patient may always be open to question, nevertheless it would seem that if one is chiefly interested in increasing the resistance of the peritoneum to infection this can be accomplished much more effectively by the use of peritoneal vaccination with Steinberg's colibacterin or a similar substance.

DR. CLAUDE F. DIXON, Rochester, Minn.: The authors have emphasized many pertinent points regarding colonic operations. Whether such operations should be carried out in one or in two stages seems to me to be dependent on many factors, the most important being the condition of the patient, the situation and type of the lesion and the custom or usual practice of the individual surgeon. One might compare single and multiple stage operations on the colon and rectum to the management of appendicitis; that is, one surgeon may present excellent results from having operated on the appendix regardless of the phase of the disease, while another may argue that this method is wrong and may present a report of excellent results in an equal number of cases in some of which he used an entirely different plan, namely deferred operation. Suffice it to say that if Drs. Stone and McLanahan and their confrères can continue to obtain such good results in one stage operations perhaps they should hold to their present method of management. Like McKittrick, I was trained, for the most part, to employ the multiple stage plan. If a surgeon completes the operative procedure in a single stage with a disastrous result he wonders what might have happened had he employed a two stage or a three stage method. During the past seven years, instead of the combined abdominoperineal resection I have carried out a procedure in which I reestablish continuity of the bowel. First, a colonic stoma is provided in the transverse or descending colon; then this is followed in two or three weeks by an anterior resection, at the completion of which, end to end anastomosis is effected. The superior hemorrhoidal vessels are sacrificed, the entire pelvic colon is removed, as in the combined abdominoperineal operation, and anastomosis is made between the lower portion of the descending colon or first part of the sigmoid and the rectum. This procedure is just as radical as the combined type of operation except that the rectum is preserved. Malignant processes in the colon rarely spread downward; therefore why is it not justifiable to preserve the rectum? In more than 300 cases in which this procedure has been employed the mortality rate has varied between 8 and 12 per cent. It is my opinion that the morbidity and mortality are much less with this procedure than with the combined operation, and in addition the function of the rectum is not disturbed, since the procedure is carried out through an abdominal incision. Sacrificing the superior hemorrhoidal vessels has not caused impairment of the circulation in

the remaining segment of rectum. In cases in which this method is employed it is possible to feel the anastomosis easily by digital examination of the rectum.

DR. FRANK H. LAHEY, Boston: I do not think there will be much disagreement between men on a subject such as this when they have all had considerable experience with it. The disagreements will be largely limited to methods of procedure. Drs. Stone and McLanahan would like to do a great many of these operations in one stage. Dr. McKittrick and some of the other men who have spoken might be considered in between their position and mine, and I represent the group who consider it advisable to remove all abdominal colons in two stages. In my clinic all abdominal colons (not rectums) are removed in two stages by the modified Mikulicz procedure which I have described. I am sure that some of them could probably be done in one stage. If it is a matter of personal reaction on my part certainly all my surgical associates agree with me in the position that the only way to ascertain whether or not the operation can be done in one stage is to risk the matter of a fatality from leakage after an anastomosis. It must be admitted, I feel sure after a large experience with this modified Mikulicz procedure, that the danger of leakage does not exist with that procedure. I know from my own figures that this two stage modified Mikulicz procedure, together with staggering of the terminal loops and immediate decompression as I suggested in my first description of this method, has definitely lowered our mortality rate and widened our operability rate. The operability rate at my clinic last year was 89.9 per cent and the mortality rate 10 per cent for all the cases of carcinoma of the colon and rectum. One of the points I want to make and which I think should be kept in mind is that cases are being rejected today which should not be rejected. One should carefully differentiate between the case in which there is extension from metastases or peritoneal spread and the case in which there is a contact carcinoma. We have had a number of patients who have had a contact carcinoma between a carcinoma of the rectosigmoid and the back of the uterus; in such a case one could remove the uterus, the tubes and the ovaries, together with the rectum. We have had cases in which there has been a contact carcinoma on the top of the bladder from a carcinoma of the sigmoid resting on top of it, but there were no metastases. The top of the bladder could be safely removed, together with the sigmoid. We have had cases of contact carcinoma on the small intestine from a malignant growth of the right colon in which several inches of small intestine has been resected together with the colon and often results of examination of the glands have been negative.

DR. HARVEY B. STONE, Baltimore: There stand out in the discussion three points that deserve emphasis. The first comprises the valuable comments made by Dr. Rives and Dr. McKittrick on the basic principles of anastomosis. As Dr. McKittrick has said, Dr. Dan Jones of Boston was one of the first to emphasize these principles, and he pretty nearly covered the entire field. There has been little to add to his comments on the importance of adequate vascular supply, the avoidance of tension in the suture line and the removal of pressure from within the bowel subsequent to the anastomosis. Dr. McLanahan and I feel that, in addition to the points emphasized by Dr. Jones and referred to by Dr. Rives and Dr. McKittrick, another important factor is the avoidance of gross soiling, which may be approximated at least by the adoption of some form of aseptic technic. The second issue, which has been commented on by every one of the discussers and which was one of the important points we had in mind in the presentation of this paper, is the merit, or otherwise, of a single or multiple stage operation. Dr. McKittrick approached his present position from beginning in the one stage group. I approached my present position in exactly the opposite path, beginning as a routine two stage operator. It is quite apparent from the comment which has been made, with which we heartily agree, that the decision in any case as to the selection of these various methods of attack must depend on a number of varying factors: the patient, the lesion, the surgeon, his experience, his predilections. The plea that we make is that the one stage operation has a field of usefulness. Quite candidly, I think that perhaps we have

pushed it too far and that in the future we shall be inclined to do more multiple stage resections than we have done in the last few years. But I should like to see those who are confirmed two stage operators equally flexible and ready in suitable cases to attempt the one stage procedure, which in spite of all the admitted objections has definite and specific advantages of its own which are not possessed by any type of two stage operation. I would plead for the use of the one stage operation in proper cases and for a point of view of adaptability and flexibility in the decision of this whole matter. The last point that I should like to reiterate is the question of what to do with the small isolated polyp in the rectum, which clinically seems benign but which on microscopic examination shows evidences of malignancy, when the malignant condition has not yet broken through the muscularis mucosae. Our procedure has been to do a local removal and to watch the patient for evidence of recurrence.

TUBERCULOSIS CONTROL

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The behavior and control of tuberculosis, whether in the individual suffering from the disease or as a community problem, depend on the proper control and disposal of bacillus-laden sputum. Control the sputum and spread is prevented; neglect this measure and cases multiply.

Although the tubercle bacillus is the specific cause of tuberculosis, it must be recognized that other factors contribute to both the epidemiology and the pathogenesis of the disease. These contributing factors may be grouped under two headings—the constitutional and the environmental. Of these the environmental factors are legion and appear to play a more common part in disease development than the constitutional. Recognizing the variables which may influence the disease in certain racial, industrial and social groups, it can be stated that contact with a sputum positive case, with its opportunity for infection and reinfection by frequent and massive doses of tubercle bacilli, appears to be the most important single factor.

Keeping in mind the significance of bacillus-laden sputum, the following procedures are essential in the administration of control measures: the reporting and registration of cases of tuberculosis, active and progressive case finding, the segregation and treatment of patients suffering from the disease, domiciliary supervision of families in which tuberculosis is or has been a problem, rehabilitation of cases, the follow-up of all cases and contacts, and financial assistance to needy families in a manner free from the stigma of pauperism. Equally important is the periodic appraisal and evaluation of procedures and services, from the point of view both of administrative economy and of more effective extension of our knowledge of the epidemiology and pathogenesis of the disease.

CONTROL BY DIVISION OF TUBERCULOSIS

In translating the preceding into administrative practice in New York State, the responsibility of the program is placed in the Division of Tuberculosis. There are fifty-seven counties in upstate New York with an estimated total population of 6,080,444. These counties vary in population from 3,929 to 813,786. The death

rate from tuberculosis has dropped from 161.5 per hundred thousand in 1900 to 44.7 in 1938.

The purposes of the division may be considered as threefold: first, direct service to the people examined and studied, their families and communities; second, research through the acquisition of data, their classification and interpretation, and third, education of the public and the medical profession. A considerable part of the general administration and supervision of the work performed by local health districts and nursing services is the responsibility of our district state health officers, of whom there are twenty. Problems which require specialized consultation or advice are handled either jointly with a member of the division staff or individually. Knowledge of the scope and extent of the disease problem in a community is as essential to the health officer as the extent and character of a lesion in an individual patient are to a clinician. Such knowledge may be acquired from detailed morbidity and mortality data. By complete checking of detailed information on death certificates regarding residence and so on and prompt and complete reporting of existing cases, the health officer is able actually to take stock and be guided wisely in his administrative program. To provide such opportunities, the reporting of tuberculosis cases is constantly being promoted by both the district offices and the division staff. Consequently the tuberculosis report cards are routed, except for our largest cities and county health district areas, through the office of the district state health officer. Each district officer maintains a case register for all reported cases in his district. The name, address, sex, age, clinical stage and sputum status are all catalogued by the use of colored flags in a visible index file for ready reference in follow-up, public health nursing supervision, and all forms of community assistance toward control. Current data relating to the patient are secured from clinics, tuberculosis hospitals and private physicians, from which each district officer is able to make periodic appraisals of the tuberculosis problem either in his entire district or in any of the counties within the district.

Time does not permit a detailed review of the many other advantages of having this information readily and constantly available. Obviously the district officer is thereby enabled to direct more intelligently the field activities in tuberculosis control, to use the data in promoting advances in case-finding methods, to secure additional clinic sessions and to employ the necessary number of public health nurses. Such data are most essential in directing the local public health nursing service along the most productive channels of service.

The case-finding activities in upstate New York are closely integrated in practically all localities with the thirty-one local tuberculosis hospitals and sanatoriums. All the county tuberculosis hospitals conduct a case-finding service as an activity of their outpatient departments. Except in one or two counties in which the total area of the county is very small, each of the hospitals conducts itinerant clinics in various sections of the respective counties. Emphasis is placed on the examination of contacts and patients who may be referred by their family physicians because of symptoms referable to the chest. There are all together approximately 120 semipermanent or permanent clinics or dispensaries, in addition to a similar service which is available for the people periodically through the itinerant service. The total number of examinations conducted in these

clinics approximated 55,000 in 1937. The total number of annual clinic examinations throughout upstate New York is between 90,000 and 100,000. The total number of special beds for tuberculosis in upstate New York is 10,326 as compared with 2,716 deaths. Of these beds, 5,537 are in state and local tuberculosis hospitals and the remainder in private hospitals or other state institutions. The ratio of total beds to deaths is 3.8 and the ratio of special public beds is 2.4.

The responsibility of the state department of health, in addition to the promotion of more adequate clinic and hospital service throughout these counties, is generally supervisory. Each hospital is surveyed annually by a representative of the Division of Tuberculosis. Specific recommendations are made regarding the scope and extent of the hospital service, and in many instances these recommendations are followed up by our district officer. In two or three of our larger cities the clinics are conducted by the local department of health, with varying degrees of participation and integration with the personnel of the local county tuberculosis hospitals.

WORK OF TUBERCULOSIS HOSPITALS

In 1930 the State Health Commission, following an intimate study of the tuberculosis control problem in New York State, recommended that the state construct three new tuberculosis hospitals and add an infirmary to Ray Brook, the one state tuberculosis hospital then existing, in order to provide hospital and other control facilities not then available in twenty-five counties.

All these counties are essentially rural and so located as to constitute four comparable districts or areas, each comprising from seven to nine counties having approximately the same population (about 300,000) and relatively the same death rate.

Each of these hospitals has been constructed in the population center of the area served. Each acts as the hub of the wheel of tuberculosis control. A continuity of medical service from case finding through treatment and follow-up of both patient and family prevails in each hospital. Tuberculosis is approached on a family and community basis, while the patient is treated as an individual.

Prior to the opening of these hospitals, the Division of Tuberculosis had for fifteen years conducted a consultation clinic service once or twice a year in the counties included in these hospital areas. As a result of this service we have been able to develop an integrated service with the general practice of medicine in these areas. The fact that practically 100 per cent of the general practitioners participate and cooperate by having their patients examined and studied by the hospital staffs has contributed more to the success of these hospital programs than any other single factor.

Each state hospital conducts an active consultation type of outpatient service within the hospital and through clinics held throughout each county in the area. Patients are admitted by a request card signed either by their family physician or by the local health officer. All patients are referred back to their physicians for a report of the examination, which is completed in detail and mailed to the referring physician. Copies of these reports are sent to the district state health officer and the local public health nurse for assistance in follow-up work.

In this clinic service, emphasis is placed on the history of contact with a known case of tuberculosis. Patients

who have experienced such contact, as well as patients who are referred by their family physicians because of suggestive symptoms or physical signs, comprise the patient attendance.

These hospitals have been in operation for approximately three years, and during the past two full years of clinic administration a total of 21,804 individuals, comprising 1.8 per cent of the total hospital areas' population, have been examined. The yield in newly discovered cases of tuberculosis among these patients was 3.1 per cent. About 50 per cent of the patients were examined because of history of contact. Of real significance is the fact that, of those patients found with tuberculosis because of the history of contact, 67 per cent were in the minimal stage of their disease, in contrast to 40 per cent of those who presented themselves to the clinic because of symptoms.

Patients are admitted for special study or treatment by applying through their family physician or health officer or directly to the superintendent of the hospital.

Following admission to the hospital, the superintendent, if he decides that the patient is unable to pay for his care, sends a bill to the clerk of the board of supervisors of the county from which the patient was admitted. Following admission, and monthly thereafter, the referring physician receives a report of the clinical progress and treatment afforded each of his patients.

Each hospital maintains a more detailed register than that of the district office. All families in which tuberculosis may be a problem are indexed in detail as to their status regarding infection, chest roentgenogram, contact with sputum positive case, clinical status, and other social and epidemiologic data.

Complete medical and surgical facilities are available in each hospital. All nurses are registered and all physicians are employed full time. A full time thoracic surgeon has been performing the major operations during alternate visits to the three hospitals, although each hospital has a resident surgeon. As a result of the advances and growth of this service which have been realized during the three years since these hospitals were opened, another full time thoracic surgeon will be engaged July 1, 1939, when the new infirmary building at Ray Brook will be opened.

The care and treatment of orthopedic patients are directed by the physicians in our Division of Orthopedics by periodic visits to each hospital.

Research and teaching characterize all phases of the program in each hospital. For many years, medical students have had the benefit of residence teaching at Ray Brook and this service, together with affiliation with schools of nursing teaching programs, is continuously carried on in the three new hospitals.

Standard nomenclature and complete outpatient and medical records are maintained in a manner by which periodic objective appraisals are made of routine practices, special circumstances or conditions relating to epidemiologic, clinical, pathologic, therapeutic or social manifestations or influences which are related to the disease.

Although the laboratory in each hospital conducts all routine examinations, each one is carrying on studies in different fields of research—in one bacteriology, in a second physiology of respiration, in a third special studies relating to the tissue reaction to the tubercle bacillus, and in the fourth pathology. In this manner

duplication of work is avoided and the special resources of all four hospitals are available to any one of the laboratories.

Occupational therapy and some vocational training and guidance are carried on in each hospital. In like manner a medical social worker in each assists the patient and family in adjusting the many industrial, economic and household problems which arise as a result of the disease.

SPECIAL STUDIES

Among the special studies which are being carried on by the Division of Tuberculosis, in addition to this routine program, are those concerned with both the epidemiology and the pathogenesis of the disease.

With special reference to case finding, the department has never looked with favor on the tuberculin testing of school children as a profitable method of finding new cases of tuberculosis. It is our conviction that the most productive method is the examination of contacts and of patients referred by physicians. Although these groups constitute a major problem in every community, there is need for case finding also in other groups, especially among adults. The examination of school children is the least productive method of finding new cases.

As a preliminary to an investigation of the epidemiology and pathogenesis of tuberculosis, selected groups of the population in several sections of the state are being examined. Some of these studies are being conducted entirely by the Division of Tuberculosis, while others are in cooperation with other state departments.

In cooperation with the Division of Industrial Hygiene of the State Department of Labor, an x-ray study of workers in various industries is being carried on. To date we have examined approximately 8,500 workers in heavy industries, including nearly 5,000 workers in foundries and some workers in grain elevators, woodworking establishments and scouring powder and asbestos products factories. The average yield of significant pulmonary tuberculosis was 1 per cent. The detailed results of these continuing studies will be published from time to time.

For purposes of public health education, case finding and investigation in pathogenesis, we have been making tuberculin tests of students and roentgenographing the positive reactors in nine teachers colleges in upstate New York. To date, 6,021 have been examined, of whom 30 per cent reacted to tuberculin and seventeen, or a percentage of 0.3, cases of reinfection type tuberculosis have been found. All negative reactors are retested during the second and third years of their attendance, and those who react, plus the positive reactors of the previous years, are roentgenographed. The details of this study will be reported at a later date.

The high incidence of tuberculosis among mental patients is indicated by the tuberculosis death rates in the New York State mental hygiene hospitals, which varied during 1937 from 200 per hundred thousand to as high as 1,700 per hundred thousand, with a rate of 812 for the total group. It should be mentioned that other death rates indicate that feeble-minded and mental patients are constitutionally inferior to the general population. The pneumonia rate, as an example, is approximately ten times greater among mental patients than among the general population; the general death rate among mental patients is 65 per thousand, whereas the rate in the entire population is 13 per thousand. From an epidemiologic standpoint this indicates that the

serious problem resulting therefrom is not limited to the spread of this disease among patients but is of extreme importance from the standpoint of the employees. The careless manner in which mental patients cough and expectorate presents problems in prophylaxis which demand special consideration and study. In like manner a study is now being conducted in one of the hospitals for the insane.¹ To date 1,295 patients have been examined, with a yield of 106 newly discovered cases of active pulmonary tuberculosis and an additional eighty whose chest roentgenograms indicate the need for further study before they can be accurately defined. The total number of employees in the institution in which this study is being conducted is 750, of whom fourteen have been admitted to the neighboring state tuberculosis hospital for treatment within the past two years. Of the 160 employees already roentgenographed, four definite cases of pulmonary tuberculosis have been diagnosed and, in addition, two other employees' roentgenograms indicated the necessity for further study before an accurate diagnosis can be made. These are in addition to the fourteen who were already hospitalized, which indicates the seriousness of this problem.

Another study which is being conducted in cooperation with this department is a continuing appraisal of the epidemiology and pathogenesis of tuberculosis by the tuberculin testing and roentgenographing of 2,300 inmates of a school for the feeble-minded. In the original examination of this group, 61 per cent reacted to tuberculin and 2.7 per cent showed x-ray evidence of reinfection type tuberculosis. All of these persons are given tuberculin tests and the reactors roentgenographed every six months. Detailed observations are made regarding their domiciliary and hospital environment, with particular reference to the possibility of contact with a person having pulmonary tuberculosis. From the standpoint of contact, the environment in which these patients are cared for is under control in that all persons with whom the inmates come in contact in the daily institutional routine are roentgenographed periodically. The results of this interesting and valuable study will be reported later.

A similar tuberculin-testing and x-ray study is being made of 500 inmates of a state institution for delinquent girls between the ages of 12 and 17 years. Constitutionally and biologically, these girls are different from those found in the feeble-minded group. Constitutionally, the latter group is more comparable to the general population than the mental patients.

In order to create more interest among physicians and general hospital authorities regarding tuberculosis, and perhaps to determine a possible cause for the apparently large numbers of nurses and interns who develop pulmonary tuberculosis, an x-ray survey of 5,000 adult admissions to fourteen general hospitals has been conducted with the cooperation of the administrators and x-ray departments of the hospitals. This study, which will be reported in detail later, revealed that 1.2 per cent of all adult admissions (excluding all known cases of tuberculosis) have pulmonary tuberculosis. In 0.5 per cent the histories contained data which might have resulted in a diagnosis of tuberculosis before the patient was discharged; in 0.7 per cent the records contained no evidence that tuberculosis was suspected. If the same conditions prevail throughout

1. The results of this study, when completed, will be published by Dr. John K. Deegan, Superintendent, Hermann M. Biggs Memorial Hospital, Ithaca, N. Y., under whose direction it is being made.

the United States, about 45,000 cases of unrecognized pulmonary tuberculosis were admitted to general hospitals last year.

As a preliminary study of workers engaged in handling foods, all the employees (1,500 in number) of a food production plant were roentgenographed. Only two cases of pulmonary tuberculosis were discovered. It is of interest that this plant is located in a county having a tuberculosis death rate of 44 per hundred thousand of population.

ECONOMIC ASPECT

In the control of tuberculosis, excluding the tubercle bacillus itself, the greatest common denominator in the problem is the almighty dollar. Although the association of tuberculosis and poverty is generally recognized, actual studies made in our service revealed some startling facts. One study of 226 consecutive patients showed that 112 were the principal wage earners of their families and 114 were dependents. Of the families in which the principal wage earner was the patient, the total family annual income exceeded \$2,500 in only six instances. Of these, two had three dependents, one had five dependents, two had two dependents and the sixth had no dependents. Since the earnings of the principal wage earner of this group were terminated at the time of illness, the economic factor assumes paramount importance. Only eight of the families of the 114 who were dependents had a family income of \$2,500 or more. The average number of other dependents was four.

Another study of 302 patients revealed that the average duration of their disease at the time the study was made was three years and four months. Of this group, all persons who had an income of \$500 or less the last year of employment were classified as dependents.

The cost of the disease, including loss of wages, physicians' services, drugs, clinic service and hospital care—whether paid by the family, locality or state—was \$5,421 for the male wage earners and \$5,132 for the female wage earners. The disease cost for the dependents averaged \$2,402.

On the other side of the family ledgers, the total annual family income was \$2,500 or more in but 3 per cent of this total group.

The economic aspect of the problem stands out in bold relief when it is realized that a survey shows that in public tuberculosis hospitals in New York State only 4 per cent of the cost of the care of patients came from the patients or members of their families. Moreover, the experience of tuberculosis hospitals throughout the United States has revealed, in a recent survey by the American Medical Association, that only 9 per cent of all patients are able to pay for part of their care and 6 per cent for all of their care.

In addition to the foregoing, other special studies—either as a part of routine administrative procedures or as special projects—are being conducted regarding such detailed aspects of the control problem as circumstances influencing the reporting of cases of tuberculosis by private physicians, the longevity of tuberculous patients following the onset of symptoms or the diagnosis, the relative value of the various methods of treatment including collapse therapy, the significance of industrial and economic factors and their effect on the patient, the family and the community, the appraisal of various routine administrative methods used in clinics, dispensaries and tuberculosis hospitals, and the deter-

mination of significant and helpful factors favoring the rehabilitation of patients and their reestablishment as self-sustaining persons in the community.

SUMMARY

To spread tuberculosis a human being must have an open lesion. The epidemiology and the study of the control of tuberculosis present a more complex problem than almost any other of the communicable diseases for which the cause is known. The transmission of infection occurs most frequently among persons in more intimate contact with the patient who has the disease. Of all persons who become infected with the tubercle bacillus, only a small percentage develop the reinfection type of tuberculosis. Pulmonary tuberculosis is a disease primarily of adults. Environmental factors seem to have a more common influence on the development of disease than do the constitutional factors. The common denominator found in the tuberculosis problem is the almighty dollar. A vicious circle prevails between poverty and tuberculosis and tuberculosis and poverty. Before many specific factors can be individually evaluated, more information must be obtained. If, however, our present knowledge could be applied to our present and future medical and public health practices, the mass behavior of tuberculosis should be changed. The tremendous amount of needless suffering, unnecessary deaths and the enormous economic losses resulting from the disease can be appreciably reduced. They should be.

ABSTRACT OF DISCUSSION

DR. LEVERETT D. BRISTOL, New York: I was impressed by the results that have been accomplished in New York State. The reduction in the death rate over the past years from 161 per hundred thousand to 44 per hundred thousand, the fact that there are now 3.4 beds per annual death in the state of New York, and that they are finding a high percentage of cases of tuberculosis in the minimal stages are all measurable criteria of progress in that state. There is no state in the United States where there is better organization for the control of tuberculosis than in New York State, including a complete coordination of effort between local groups, county agencies, the district groups of the state department of health and the strong voluntary tuberculosis and public health committees which exist. Also, the leadership of the state department of health, through Dr. Plunkett's division, has had a great deal to do with the results accomplished. It has conceived its function not only to be one of routine service to the people of the state but also to carry on educational phases and particularly research studies. If I were to emphasize anything as to tuberculosis in industry it would be that the great majority of people are employed by smaller industries, in groups where they do not have facilities for careful examinations of applicants, periodic health examinations or tuberculosis case finding. More and more the public agency interested in tuberculosis must come to the assistance of these people and work out a cooperative program with the smaller private industries. I hope that Dr. Rice will tell us of the work that the New York City Department of Health has been doing in cooperation with some of the industrial organizations in tuberculosis case finding. In only a few of the larger industries are employees paid when they are away from their job on account of sickness. If we are to get at the economic problem of tuberculosis, it must be possible for employees in the smaller industries to be remunerated when they are away taking the cure. Dr. Plunkett has raised a question with reference to tuberculin testing of school children. He represents the official agency which has to think in terms of profitable investment of tax money. When Dr. Plunkett suggests that his own department sees little value in tuberculin testing of children, I may agree with him so long as the reference is particularly to grade school children; but with reference to high schools and college

groups it is certainly worth continuing this important work. I shall look forward to the continuation of Dr. Plunkett's studies in New York State.

DR. EARL MORRIS, Hays, Kan.: As a student health director, I should like to ask two questions: First, shall I continue to give tuberculin tests in my program of case finding or should I disregard it as quite largely a waste of time and money and center on the x-ray film and fluoroscope, and perhaps a more intensive examination of the family and other contact history? Second, if I continue tuberculin testing, as I probably shall, in my program—we require hygiene of all freshmen, and as we come to the section on tuberculosis we do tuberculin testing as a routine class procedure, a piece of laboratory work . . . should there be any difference in advice given to negative and positive reactors; in other words, may my students regard the results of tuberculin tests as contributing something to their future program of personal and community hygiene?

DR. JOHN L. RICE, New York: For the past few years, Dr. Edwards, who is the director of the Bureau of Tuberculosis, has been carrying on an extensive case-finding program among special groups in New York City. Examples of such groups are 75,000 adults receiving home relief, about 7,000 persons in a district inhabited largely by Puerto Ricans, about 5,000 pupils in the city's high schools, and several thousand patients attending the venereal disease clinics. Altogether about 150,000 adults and young adults have been surveyed by means of paper-film x-ray examinations, and this has disclosed about 3,500 new cases of tuberculosis. It has been gratifying that in a large proportion of these cases the disease was in its early stages. Dr. Edwards is now extending this case-finding project into the industrial field—beginning with those engaged in the fur industry. This particular survey is being made at the request of the industry.

DR. ROBERT E. PLUNKETT, Albany, N. Y.: From the standpoint of the epidemiology of tuberculosis, it must not be forgotten that tuberculosis is constantly becoming a disease of older persons and that this applies particularly to males. In 1915 in upstate New York the highest death rate in males from tuberculosis was in men between the ages of 25 and 35 years. In 1937 the peak was in the group between 55 and 64. This is quite a change over a period of twenty-two years. In eleven years in upstate New York, the average ages of patients both whose cases are reported and who died have increased by five years in males and by three years in females. This change is considerably greater than the increase in the average age of the population during the same period. In our clinic service, on the basis of two years' experience, it costs us—and it is a selected group of the population, made up of persons referred because of contact or suspicious symptoms—\$1,737 to discover a case in a child under 15 years, \$77 to discover a case in a person over 45, and \$119 for all over 15 years of age. Dr. Morris wanted to know whether he should still use the tuberculin test. There is a definite place in this field for the tuberculin test, but before using it there should be intelligent consideration of the size and scope of the problem. If he is working in a community with a death rate of 20 or 30, he will save money by doing the tuberculin test, but if he is studying adults in a community with a death rate of 60 or 70, he will waste time and money by doing tuberculin tests. Although tuberculin still has a place, the x-ray examination is in general more useful in finding tuberculosis and is useful also in discovering other pathologic conditions in the thorax. We are using tuberculin in our normal school studies and other studies, but the thing we are opposed to in New York State is the program, which has been so popular for seven or eight years, of using the tuberculin test as the basis of case finding among school children and of stopping there. There is too little attention given to the home in which that child lives and to the economic and domiciliary factors which influence the spread of tuberculosis within the family. If a child reacts to tuberculin, the younger the child the more likely it is that the infection occurred in the home. As the child grows older, the more likelihood there is of infection outside the home. The home should be searched to make sure that the cause is not there. As far as the negative reactors are concerned, they might be followed to see how soon they become positive, and some day there may be data concerning the development of positive reactors which will be of primary significance.

RESULTS OF TREATMENT IN A PSYCHIATRIC OUTPATIENT DEPARTMENT

A FOLLOW-UP STUDY OF 166 CASES

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In this paper we present the observations made in a follow-up study of 166 patients who had been treated in the psychiatric outpatient department of the University of Chicago Clinics between July 1, 1935, and March 30, 1937. We have attempted, by means of a review of the records and follow-up interviews, to evaluate the results of treatment, to compare the original diagnoses with the diagnoses made at the time of the follow-up interviews and to relate the present study with a previous study on inpatients.¹

METHODS AND MATERIALS

The criteria for inclusion of a patient in this study were that he had been seen originally by one of us at least one year previously to the time of follow-up and that a thorough physical and psychiatric work-up had been recorded when the patient was first seen.

Of the 206 cases reviewed, forty were discarded for the following reasons: Eighteen patients had also been inpatients and had received more intensive treatment than the others; in sixteen instances the data recorded at the time of the original interview were too few to permit conclusions to be drawn, and six patients could not be reached.

The time between the first visit of a patient to the clinic and the follow-up study ranged from one year to two and one-half years. The time in months since the patient's last visit to the clinic ranged from one to thirty. These wide ranges are explained when it is realized that a number of patients were seen on only one occasion, while others continued to make visits to the outpatient department over as long a period as eighteen months.

The sources of referral of patients were as follows: Ninety-seven were referred from other departments in the University of Chicago Clinics. Twenty-nine had been sent by their families or by friends. Twenty-four came of their own initiative. Nine were referred by outside physicians and seven by social agencies.

It will be of some interest to consider briefly certain of the statistical data shown in table 1. The 166 cases are distributed through fifteen diagnostic categories. The diagnostic criteria used in assigning cases to the various categories are those set forth by the American Psychiatric Association and the National Committee for Mental Hygiene in 1934.² The series is composed of 115 cases of neurosis, thirty-one of psychosis, nineteen of psychopathic personality and one of epilepsy. The

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1. Masserman, J. H., and Carmichael, H. T.: *Diagnosis and Prognosis in Psychiatry: With a Follow-Up Study of the Results of Short-Term General Hospital Therapy of Psychiatric Cases*, J. Ment. Sc. 84: 893-946 (Nov.) 1938.

2. Statistical Manual for the Use of Hospitals for Mental Diseases, ed. 6, New York, National Committee for Mental Hygiene, 1934.

individual diagnostic groups contain few cases, with the exception of anxiety state with twenty-nine cases, mixed psychoneurosis with forty-one cases, psychopathic personality with nineteen cases, conversion hysteria with seventeen cases, and manic-depressive psychosis with thirteen cases (all instances of depression).

Eighty of the 166 patients were male and eighty-six were female. The mean age of the group was 30.1 years. The average school grade attained by the 127 patients concerning whom information as to education was available was 10.2. Forty patients were foreign born, fifty-five were born in the United States of foreign-born parents and seventy-one were born in this country of parents who themselves had been born here. Sixty-nine patients were single, eighty-six married, four separated, five divorced and two widowed. Seventy-seven patients gave their religious affiliations as Protestant, forty-eight professed to be Roman Catholic, thirty-two were of Jewish faith and nine indicated no religious affiliations or said they had no religion.

The 100 cases were distributed throughout fifteen diagnostic groups, but only three groups contained more than ten cases, viz., anxiety state with twenty cases, mixed psychoneurosis with nineteen and conversion hysteria with eleven (table 2). Evidence of organic disease had been found in thirty-four of the 100 patients at the time of the original physical examination³ (table 2).

RESULTS AND COMMENT

In table 2 are shown the differential symptoms in the 100 followed-up cases. Perusal of this table shows that disturbances of both somatic and mental functions were complained of by patients in all diagnostic groups. Complaints of somatic dysfunction were not confined to any one of the organ systems or sensory modalities. Likewise, disturbances of mental functions are seen to occur in all diagnostic groups, with the exceptions that delusions and hallucinations are not found among the psychoneuroses or psychopathic personalities.⁴ These figures seem to indicate that most neurotic and psychotic reactions tend to be of mixed character.

The question of the relation of the somatic symptoms of neurotic and psychotic patients to the various organic systems of the body is one of great interest. Careful study showed that frequently a patient had no complaints referable to an organ system in which disease

existed. For example, a patient who showed evidence of rheumatic heart disease made no complaints regarding the cardiovascular system but had numerous complaints of dysfunction in several of the other systems. On the other hand, patients with somatic complaints in whom no definite evidence of organic disease was found at the initial examination later showed positive signs of organic disease related to the original somatic complaints.

There is also, of course, the puzzling question of why the individual patient chooses the particular organic system or systems to which he refers his complaints. Fenichel,⁵ in discussing this problem in relation to the field of the so-called organ neuroses, pointed out that some of the multiple determining factors are: "somatic compliance, special factors in the infantile history of the individual, a partial pregenital fixation, and the particular suitability of an organ for symbolic representation." Similarly, the tendency shown by patients to shift their somatic complaints from one system to another or to add complaints referable to another system was exemplified strikingly in our series of patients.

Our present study demonstrates clearly that a neurosis and organic disease may be present in the same patient, that a neurosis may precede or follow the development of organic disease, and that a neurosis or psychosis may mask the presence of organic disease or that the reverse of this may occur. Our observations in a previous study¹ with reference to symptoms were the same as those reported here. Comroe,⁶ in a follow-up study of 100 cases of "neurosis," reached conclusions which are essentially in agreement with those we have just expressed, and he emphasized forcibly the necessity for thorough examination of neurotic patients so that the presence of organic disease will not be missed.

In our investigation of etiologic factors there were noted certain trends, which may be presented at this point. Ingestion of alcohol appeared to be a factor in six cases and the use of barbiturates in one case. Somatic disease was present in thirty-four of the 100 cases but did not play a direct etiologic role in all instances. Five patients were found to have varying degrees of mental deficiency.

Entirely apart from the deficiencies in the records, it was found most difficult to evaluate the psychologic factors concerned in the etiology, inasmuch as the importance attached to the various maladjustments shown by the patients depended on the reliability of the sources of information, the thoroughness of the psychiatric examination, and the training and personal bias of the psychiatrist who had obtained and interpreted the data. As might be expected, environmental difficulties of familial, economic, occupational, marital, religious, social or sexual nature were found to be factors. Usually the difficulties were present in more than one environmental sphere and in most cases these exogenous factors were combined with endogenous personality difficulties in producing symptoms.

When we endeavored to classify the patients as to the personality they presented before the onset of the neurosis or psychosis, we immediately encountered almost insuperable difficulties inherent in any attempt to group patients under various personality types or to ascertain what earlier sets of traits and attitudes can be correlated with the clinical pictures presented in the

3. Ten of the twenty patients with anxiety states had various organic diseases, viz., one case each of rheumatic heart disease, auricular fibrillation, central nervous system arteriosclerosis, hyperthyroidism, strabismus, multiple sclerosis, menopause and chronic cholecystitis and two cases of essential hypertension. Among those with conversion hysterics the following organic conditions were present: one case each of thrombosis of the right subclavian vein, essential hypertension, hypothyroidism following a previous thyroidectomy and chronic prostatitis. Four of the patients with manic-depressive depressions showed physical abnormalities, viz., two cases of uterine fibromyomas and one case each of traumatic atrophy of the left upper arm and acute gonorrheal urethritis. In the group of mixed psychoneuroses, six patients were found to have physical diseases, viz., one case each of osteomyelitis, rheumatic heart disease with nodular goiter and elevated basal metabolic rate, and uterine fibromyomas with secondary anemia. In both the group of behavior disorders and that of reactive depression a case of chronic epidemic encephalitis was included. The group of cases of psychosis with disease of the central nervous system was made up of one case of presenile psychosis, one case of tabetic dementia paralytica and one case of arteriosclerosis of the central nervous system. Two of the patients with psychopathic personality were found to have syphilis. Perhaps two other cases, which are not recorded in table 2, should be considered to present evidence of organic disease, viz., one patient with reactive depression had hemorrhoids with severe secondary anemia, while the patient with undiagnosed psychosis had obesity.

4. Attention may be drawn to the large number of cases in which complaints referable to the muscular system (sixty-seven cases) and to the gastrointestinal system (fifty-three cases) were made. Complaints referable to the sexual function (which included impotence, frigidity, ejaculation praecox and masturbation) were made by thirty-seven patients. Among disturbances of mental functions, anxiety (seventy-four cases) and depression (fifty-three cases) were the most commonly observed symptoms. Phobias were noted in twenty-nine cases.

6. Comroe, B. J.: Follow-Up Study of 100 Patients Diagnosed as "Neurosis," *J. Nerv. & Ment. Dis.*, 83: 679-684 (June) 1936.

various psychoses and neuroses. An excellent example of this is shown in the report by Bowman and Raymond⁸ on studies of the prepsychotic personality in schizophrenic patients and in Bowman's⁹ study of the personality in schizophrenia, affective disorders and dementia paralytica and in normal subjects. Among the difficulties encountered is the confusion which obtains at times as to whether certain traits are prepsychotic characteristics or early psychotic manifestations. A second difficulty is that of estimating the reliability of the information given. With only one informant it seems easy to code the personality traits of a patient, but when there are several informants, the number of traits put down as unknown or questionable increases markedly. Other considerations concern changes in diagnosis and the difficulty of having too many persons collect and evaluate the data.

The great importance of studies of the prepsychoneurotic personality has been stressed by Hinsie.¹⁰ He

information was available there seemed to be so great a mixture of traits and attitudes that it was found impossible to fit the patients into such categories. One word characterizations of personality, such as "perfectionistic," "aggressive" and "normal," were discarded, since they seemed woefully inadequate when used to describe a complex structure such as the human personality.

In our previous study of inpatients¹ we tried to estimate the degree of insight manifested by the patients and drew up definitions of various grades of insight. It has always been a difficult question to decide how much insight a patient has. Indeed, it is a moot question as to whether satisfactory criteria can be set up. In table XI of our previous paper¹ the following definitions of five degrees of insight are given:

[The patient] (1) does not consciously admit psychogenesis of illness but instinctively keeps returning to psychiatrist for aid; (2) admits psychic nature of illness but constructs vague

TABLE 2.—Differential Symptoms in the Various Diagnostic Groups in 100 Followed-Up Cases

Diagnostic Group	No. of Patients	Disturbances in Somatic Functions										Disturbances of Mental Function											
		Organ Systems						Sensation															
		Muscular	Gastrointestinal	Cardiovascular	Genito-Urinary	Vascular	Sexual*	General†	Skin	Special Senses	General‡	Speech	Anxiety	Depression	Suicidal Trends	Inferiority Feelings	Guilt Feeling	Delusions	Hallucinations	Phobias	Obsessions and Compulsions	Other Disturbances§	Organic Disease Present
Simple adult maladjustment....	7	3	1	1	0	0	3	3	1	0	2	0	5	4	0	1	1	0	0	1	1	9	0
Anxiety state.....	20||	17	13	9	6	0	7	12	6	3	8	12	20	11	2	3	2	0	0	7	3	14	0
Conversion hysteria.....	11	6	9	6	2	2	6	7	4	4	9	2	10	5	0	5	3	0	1?	1	2	7	4
Hypochondriasis.....	3	1	2	1	0	0	1	2	1	0	1	1	3	1	1	1	0	0	0	2	0	0	0
Manic-depressive psychosis.....	6	5	2	1	0	0	2	1	0	0	0	1	2	6	5	4	0	1	0	1	1	4	4
Mixed psychoneurosis.....	19	14	12	3	6	1	4	13	3	2	10	0	19	10	2	1	5	0	0	6	1	15	6
Compulsive states.....	3	1	1	2	0	0	0	2	0	0	2	0	3	1	0	0	1	0	0	3	2	2	0
Paranoid conditions.....	4	2	1	1	0	0	1	1	1	0	3	0	2	2	0	0	1	4	1	0	0	3	3
Behavior disorders.....	4¶	3	1	1	0	0	2	0	0	2	1	1	3	0	0	1	1	0	0	1	0	1	1
Psychopathic personality.....	9	5	2	1	2	0	6	4	2	1	3	1	4	6	2	3	1	1?	0	3	1	3	2
Psychosis with C. N. S. disease..	3#	3	2	0	1	0	1	2	0	0	0	0	1	1	1	0	0	0	0	1	0	2	3
Reactive depression.....	3**	3	3	0	0	0	1	2	0	0	0	1	1	3	0	1	0	0	0	0	0	1	1
Schizophrenia.....	6	4	3	0	1	0	2	3	1	1	3	1	3	0	0	0	2	5	2	1	0	5	0
Undiagnosed psychosis.....	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0
Epilepsy.....	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Totals.....	100	67	53	27	19	3	37	53	20	14	43	11	74	53	14	20	17	12	4	20	12	77	34
Column number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

* Includes impotence, frigidity, ejaculatio praecox, exhibitionism, etc.
† Includes headache, insomnia, etc.
‡ Includes vertigo, pain, paresthesias, etc.
§ Includes tension, retardation, excitement, amnesia, irritability, etc.
|| Includes one case of multiple sclerosis.

¶ Includes one case of chronic epidemic encephalitis.
Includes one case of presenile psychosis, one case of taboparesis and one case of C. N. S. arteriosclerosis.
** Includes one case of chronic epidemic encephalitis.

pointed out that a knowledge of the personality previous to the onset of neurosis is missing in the psychiatric literature, whereas the term "prepsychotic personality" is in the everyday language of the psychiatrist. This reminds us of an additional difficulty in studies of personality in neuroses and psychoses, namely, the lack of studies on so-called normal controls. Bowman⁹ referred to this as a valid criticism and attempted to meet this objection by studying a group of normal controls for personality traits.

We were not satisfied with the results of our efforts to classify the 100 followed-up cases under various personality "types." It was possible to classify some patients by such a term as "schizoid," "cyclothymic" or "shut-in." In the majority of cases in which adequate

rationalizations as to "nerve strain from overwork," "nervous breakdown," etc.; (3) admits the relationship of emotional difficulties to his illness but insight mainly intellectual, and tendency to blame others for inner conflicts persists; (4) realization of the significance and personal origin of his past emotional conflicts but rejection of insight that would occasion severe narcissistic trauma; (5) deeper insight into ambivalence and inner conflicts, including those arising from erotic urges and unjustified aggressive drives previously repressed.

The definition of the fourth degree might be said to be the point at which real insight begins, while what is defined as the fifth degree constitutes a close approximation to the self understanding that is the goal of all psychotherapists for their patients but which probably is not readily attainable by other means than psychoanalysis. The facts and comments just noted, together with the inadequacy of our records, seem to preclude any conclusions regarding the degree of insight in the present series of patients.

As in our previous study of inpatients,¹ we wished to examine the prognosis assigned to patients and to

8. Bowman, K. M., and Raymond, A. F.: A Statistical Study of the Personality in Schizophrenic Patients, *Schizophrenia, A. Research Nerv. & Ment. Dis., Proc.* 10: 48-74, 1931.
9. Bowman, K. M.: A Study of the Prepsychotic Personality in Certain Psychoses: The Biology of the Individual, *A. Research Nerv. & Ment. Dis., Proc.* 14: 180-210, 1934.
10. Hinsie, L. E.: Concepts and Problems of Psychotherapy, New York, Columbia University Press, 1937, p. 101.

compare it with their actual status at the time of follow-up. On the basis of the information in the case records, we could estimate prognosis in only three degrees, namely, that the patient was expected to get worse, to show no change or to show improvement. On this basis we estimated that thirty-one of the 100 patients would remain in statu quo or get worse and that sixty-nine would show varying degrees of improvement. As far as the information was available, we tried to determine prognosis from several interrelated considerations.¹¹ On comparison of the results at the time

An attempt to evaluate the effectiveness of any single therapeutic method could not be successfully carried out, since more than one method was used in almost all cases. The methods of treatment employed include all indicated medical and surgical measures, sedation, environmental readjustments, interviews with psychiatric social workers, and superficial psychotherapy such as reassurance, suggestion and persuasion. Institutional care was recommended for some of the psychotic patients. In three cases a formal psychoanalysis was advised. Owing to the small number of cases in the

TABLE 3.—Changes in Symptoms and General Status After One Year or More of Follow-Up Study

Diagnostic Group	No. of Patients	Change in Symptoms															General Status										Number of Cases Showing 2+, 3+ or More Improvement	
		Somatic					Mental					Died	Institution	General Status														
		Worse	No Change	+1	+2	+3	+4	+5	Worse	No Change	+1			+2	+3	+4	+5	Worse	No Change	+1	+2	+3	+4	+5				
Simple adult maladjustment.....	7	0	0	0	2	3	1	1	0	0	0	2	2	2	1	0	0	0	0	2	3	1	1	7	5			
Anxiety state.....	20	2	4	1	5	3	5	0	3	7	2	2	4	1	1	0	1	2	4	5	3	4	2	0	9	6		
Conversion hysteria.....	11	0	1	3	5	0	1	1	1	3	2	2	2	1	0	0	0	1	2	2	4	1	1	0	6	2		
	3	0	1	0	1	1	0	0	0	1	0	1	1	0	0	0	0	0	1	0	0	2	0	0	2	2		
	6	2	0	1	2	0	0	1	2	0	0	1	1	1	1	0	2	2	0	0	1	1	2	0	4	3		
	19	3	5	4	4	1	2	1	4	3	3	3	2	4	0	0	1	2	3	5	3	2	4	0	9	6		
	3	1	1*	0	0	0	1	0	0	2	0	0	1	0	0	0	2	2	0	0	0	1	0	0	1	1†		
	4	2	1	0	0	0	0	1	2	0	1	0	1	0	0	0	2	2	0	1	0	0	1	0	1	1		
	4	0	3‡	0	0	0	0	1	0	1	0	0	0	2	1	0	0	0	1	0	0	2	1	3	3‡	3‡		
	9	1	2‡	2	0	3	1	0	1	3	1	2	2	0	0	0	1	1	1	3	1	2	1	4	0	3‡		
ease.....	3	3	0	0	0	0	0	0	3	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0		
Reactive depression.....	3	0	0	1	1	0	1	0	0	0	0	2	1	0	0	0	0	0	0	1	1	1	0	0	2	1		
Schizophrenia.....	6	1	2	0	3	0	0	0	1	1	2	0	1	0	0	0	2	1	2	2	0	1	0	0	1	1		
Undiagnosed psychosis.....	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	1	1		
Epilepsy.....	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1		
Totals.....	100	14	20§	12	24	12	12	6	17	21	11	15	20	11	4	2	13||	16	14	19	15	20	14	2	51	36		
Column number.....		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	

Code: Change in Symptoms		General Status	
Worse (col. 2 and 0)	Symptoms worse (—1 to —5).	Died (col. 16)	Death
No change (col. 3 and 10)	Symptoms unchanged.	Institutionalization (col. 17)	In public or private mental hospital.
+1 (col. 4 and 11)	Slight or intermittent symptomatic improvement.	Worse (col. 18)	General status worse (—1 to —5).
+2 (col. 5 and 12)	Greater improvement but extent variable, with tendency to form other symptoms.	No change (col. 19)	Remains in statu quo.
+3 (col. 6 and 13)	More stable improvement with recurrence of symptoms only under stress.	+1 (col. 20)	Slight and variable improvement in somatic complaints, mental symptoms or environmental difficulties.
+4 (col. 7 and 14)	Disappearance of presenting symptoms with a residuum of only a few minor complaints.	+2 (col. 21)	Definite improvement in one or more of these spheres, but some complaints still present and general adjustment at a somewhat lower level than previous to onset of the patient's illness.
+5 (col. 8 and 15)	Complete disappearance of symptoms, with no return under severe emotional and environmental stresses.	+3 (col. 22)	Recovery from presenting symptoms with satisfactory resumption of occupational, familial and other duties unless subjected to severe stress.
		+4 (col. 23)	Complete recovery from presenting symptoms with apparent capacity to maintain this even under severe stress.
		+5 (col. 24)	Complete and stable recovery with marked improvement in capacity for personal and social adaptations.

Code: Change in Symptoms

- Worse (col. 2 and 9) Symptoms worse (—1 to —5).
 No change (col. 3 and 10) Symptoms unchanged.
 +1 (col. 4 and 11) Slight or intermittent symptomatic improvement.
 +2 (col. 5 and 12) Greater improvement but extent variable, with tendency to form other symptoms.
 +3 (col. 6 and 13) More stable improvement with recurrence of symptoms only under stress.
 +4 (col. 7 and 14) Disappearance of presenting symptoms with a residuum of only a few minor complaints.
 +5 (col. 8 and 15) Complete disappearance of symptoms, with no return under severe emotional and environmental stresses.

General Status

- Died (col. 16) Death.
 Institutionalization (col. 17) In public or private mental hospital.
 Worse (col. 18) General status worse (—1 to —5).
 No change (col. 19) Remains in statu quo.
 +1 (col. 20) Slight and variable improvement in somatic complaints, mental symptoms or environmental difficulties.
 +2 (col. 21) Definite improvement in one or more of these spheres, but some complaints still present and general adjustment at a somewhat lower level than previous to onset of the patient's illness.
 +3 (col. 22) Recovery from presenting symptoms with satisfactory resumption of occupational, familial and other duties unless subjected to severe stress.
 +4 (col. 23) Complete recovery from presenting symptoms with apparent capacity to maintain this even under severe stress.
 +5 (col. 24) Complete and stable recovery with marked improvement in capacity for personal and social adaptations.

* One patient had no somatic symptoms.

† Two patients had no somatic symptoms.

‡ One patient had no somatic symptoms.

§ Four patients had no somatic symptoms.

|| Several patients had been discharged.

of follow-up examination with the prognosis as previously estimated, it was found that we were correct in eighty-seven cases. However, this figure cannot be accepted at face value, since under the heading "improvement" we had included all degrees up to complete recovery.

In table 3 are shown the degrees of change in somatic and mental symptoms and an estimate of the general status of the patients who were observed at the time the follow-up study was made. These were graded on the basis of the definitions set forth at the bottom of the table.

11. Criteria for determination of prognosis were (a) an evaluation of the patient's constitutional makeup, both physical and mental; (b) the nature and intensity of previous neurotic or psychotic reactions; (c) the type, duration and severity of the presenting illness and the depth of emotional reactions, and (d) the results of the various forms of therapy which had been used previously, including the availability of an extramural milieu devoid of occupational, familial, social, economic or sexual stresses beyond the capacity of the patient to withstand (see our previous paper on inpatients¹).

individual diagnostic groups, no conclusions of statistical significance can be drawn regarding the results in any one diagnostic category.

A study of table 3 reveals the following facts: One death and one suicide occurred in our series. Three patients were psychotic with disease of the central nervous system. Thirteen patients had received institutional care, though several had been discharged previously to the time of the follow-up study. Of forty-nine patients who showed little or no improvement, sixteen were worse, fourteen had shown no change and nineteen showed very slight improvement. Fifty-one patients showed a degree of improvement graded plus 2 or better. Those who showed a degree of improvement of plus 3 or better numbered thirty-six. Only two patients were considered to show complete and stable recovery, although fourteen other patients gave evidence of apparent recovery.

Inspection of the results attained in the seventy cases of neurosis, the twenty cases of psychosis and the nine of psychopathic personality reveals that improvement of plus 2 or better was shown by thirty-nine neurotic patients, seven psychotic patients and four subjects with psychopathic personalities.

At the follow-up study it was found that in the interval since the last visit six patients had developed complaints which could be attributed to toxic or organic factors which had not been apparent at the time of the original physical examination. In three of the cases the original symptoms might, in retrospect, be considered as having pointed to the possibility of organic disease. In the three remaining cases the organic changes appeared to be entirely new developments (table 4).

The figures on improvement rates agree fairly closely with those reported by us for inpatients.¹ In the inpatient study, fifty-four patients showed 2 plus improvement and thirty-eight patients showed 3 plus

The difficulties of evaluating the effects of therapy in neuroses and psychoses, particularly psychotherapy, are enormous. In the first place, standard criteria of recovery are lacking. There is a tendency to use terms such as "improved," "recovered" and "well" without any attempt at definition. The same terms are used by different authors to denote varying degrees of improvement. To utilize the disappearance of the outspoken symptoms as a sign of cure is, as a rule, not justifiable. What appears to be improvement early in the course of treatment may be simply the result of the confidence the patient has developed in the physician. When this "transference" is disturbed, the patient's symptoms may all recur. The method by which the follow-up data are obtained is another important consideration. As Romano and Ebaugh¹⁷ pointed out, "it is not possible to speak of cure, remission, partial recovery or improvement on the basis of statements made by the family, friends or even patients." They also emphasized the defects of prognostic studies when the social investiga-

TABLE 4.—Changes in Diagnosis After One Year or More of Follow-Up Study

Original Diagnostic Group	Number of Patient*	Changed Diagnosis															Number Changed	Number Unchanged	Organic Disease Previously Un- known Total
		Simple Adult Maladjustment	Anxiety State	Conversion Hysteria	Hypochondriasis	Manic-Depressive Psychoses*	Mixed Psycho- neuroses	Compulsive State	Paranoid Conditions	Behavior Disorder	Psychopathic Personality	Psychosis with C. N. S. Disease	Reactive Depression	Schizophrenia	Undiagnosed Psychosis	Epilepsy	Psychosis with Psychopathic Personality		
Simple adult maladjustment.....	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	7
Anxiety state.....	20	..	..	1	..	1	3	..	..	..	..	..	..	..	..	..	..	13	7
Conversion hysteria.....	11	..	..	..	..	..	2	..	..	..	..	..	1	1	..	..	..	7	4
Hypochondriasis.....	3	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	2
Manic-depressive psychosis.....	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	6
Mixed psychoneurosis.....	19	..	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	3	16
Compulsive states.....	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3
Paranoid conditions.....	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	4
Behavior disorders.....	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	4
Psychopathic personality.....	9	..	..	..	..	1	..	1	..	..	..	..	..	1	..	..	..	3	6
Psychosis with C. N. S. disease.....	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3
Reactive depression.....	3	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	2
Schizophrenia.....	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	6
Undiagnosed psychosis.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	0
Epilepsy.....	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	0
Totals.....	100	0	1	2	1	3	6	1	0	1	1	1	1	3	0	0	1	22	78
Column number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

* All cases of depression.

improvement. Skottowe and Lockwood,¹² in a study of the fate of 150 psychiatric outpatients, found that about 35 per cent were "recovered" or "much improved," whereas 65 per cent achieved only slight or moderate improvement. Yaskin¹³ reported recovery in forty-one and improvement in forty-one of one hundred patients with neurosis. Ross¹⁴ reported 45 per cent of 1,186 patients as well and 25 per cent as improved one year after discharge. Three years after discharge the figures for 421 patients were 40 per cent well and 10 per cent improved. After five years 34 per cent of 290 patients were well and 6 per cent improved. Luff and Garrod¹⁵ reported that 65 per cent of 500 patients were improved or much improved on discharge and that 55 per cent showed these degrees of improvement at follow-up examination three years later. Landis¹⁶ gave the number of patients discharged annually as recovered or improved per hundred admitted to state mental hospitals in the United States from 1926 to 1933 as forty.

tion and questionnaire methods were used, and the necessity for a personal interview with the patient by the psychiatrist. The Five Year Report (1932-1937) of the Chicago Institute for Psychoanalysis¹⁸ stresses the fact that the final judgment of the results of treatment must rest mainly with the physician who carried out the treatment.

Malamud and Render¹⁹ quite properly insisted that a follow-up period of at least five years is essential to obtain reliable results in studies of the course and prognosis in schizophrenia. They found that the percentage of "complete recoveries" is much lower when follow-up study is done at least five years after discharge than it is when the study is made after a shorter period, e.g., one year. The results reported by Ross¹⁴ for the neuroses tend to confirm this opinion.

A serious handicap in the evaluation of the results of psychotherapy is that all too frequently the actual therapeutic measures have not been clearly defined; more

15. Luff, M. C., and Garrod, M.: The After-Results of Psychotherapy in 500 Adult Cases, Brit. M. J. 2: 54-59 (July 13) 1935.

16. Landis, C.: A Statistical Evaluation of Psychotherapeutic Methods, in Hinsie, L. E.: Concepts and Problems of Personality, New York, Columbia University Press, 1937.

17. Romano, J., and Ebaugh, F. G.: Prognosis in Schizophrenia, Am. J. Psychiat. 95: 583-596 (Nov.) 1938.

18. Chicago Institute for Psychoanalysis, Five-Year Report (1932-1937), Chicago.

19. Malamud, William, and Render, Norman: Course and Prognosis in Schizophrenia, Am. J. Psychiat. 95: 1039-1057 (March) 1939.

often than not they consist of a mixture of psychotherapeutic and other methods. This state of affairs has been mentioned by various authors (Curran,²⁰ Luff,²¹ Mapother²²). Another difficulty is the failure to make careful selection of patients before beginning psychotherapy (Curran²⁰). Since there tend to be a difference in the criteria of selection of patients for psychotherapy and also decided variation in the duration of treatment and in the methods employed, it is not justifiable to compare closely the results reported by the different clinics. We have previously pointed out¹ that any estimate of the effects of a therapeutic procedure must depend primarily on its aims and standards. For example, directly to compare the results in a series of patients treated as were the patients reported in the present study with the results obtained by formal psychoanalysis¹⁸ is, strictly speaking, not permissible. Full recognition must be accorded to the following facts: Our patients were probably not selected as carefully as are the patients for psychoanalysis; the treatment they received was not as intensive; our criteria for improvement (table 3) were less severe and were based to a greater degree on overt social adjustments, while the criteria used to estimate improvement of psychoanalytic patients were far more searching and exacting and based on changes of a stable nature in the inner organization of the personality.¹⁸

In table 4 are recorded the changes in diagnosis made at follow-up examination. For twenty-two patients a change in diagnosis was made. A new diagnosis was based essentially on reconsideration of the original data and of the clinical observations made during the time the patient was under treatment. In five instances the changes made had been foreshadowed by the secondary diagnosis made when the patients were originally classified.

The problem of change of diagnosis has been discussed by Bowman⁹ in his study of the prepsychotic personality and also by Bowman and Raymond⁸ in their paper on the personality of the schizophrenic patient. In the former paper Bowman pointed out that incorrect diagnosis may be a source of error in studies of the prepsychotic personality. He cited the necessity he found for reconsideration of original diagnoses made at the Boston Psychopathic Hospital in ninety-one of 241 cases in which the condition had been differently diagnosed at other state mental hospitals. In about 40 per cent of the cases he agreed with the new diagnosis. It should be remembered, however, that the patients were under observation for relatively few days at the Boston Psychopathic Hospital, while an observation period of a month or more was available at the state hospitals. It is unquestionable that the longer period of observation is an aid in correct diagnosis. Another factor which helps to explain changes in diagnosis at various hospitals is that there may be considerable differences between the hospitals in the way they apply the standard terminology in classifying patients. This whole topic has been thoroughly discussed by Wilson and Deming²⁴ in a statistical study of psychiatric diagnosis in Massachusetts State Hospitals in 1925 and 1926. These authors found that there was disagree-

ment between the diagnoses made at the Boston Psychopathic Hospital and those made at other state hospitals in 42 per cent of the cases or, if the undiagnosed cases are discarded, in 34 per cent. In our previous paper on inpatients¹ there was a change in the diagnosis made on discharge from the hospital in forty-one of the 100 cases in which the patients were rechecked at least one year after discharge.

The number of changes in diagnosis in the present study (twenty-two) is in marked disagreement with the forty-one changes of diagnosis made on inpatients.¹ This fact raises a number of questions. In the first place, it must be pointed out that there were seventy cases of psychoneuroses in the present study, while in the previous study there were only thirty-two. Moreover, a diagnosis of mixed psychoneurosis was made in nineteen cases in this study as compared with only six in the former study. Other possible factors may reside in the fact that the review of diagnosis in the present study was made in each case by the psychiatrist who originally saw the patient, as well as in the circumstance that, of the 100 patients followed up in the present study, sixty-four were seen by one of us and thirty-six by the other.

SUMMARY AND CONCLUSIONS

One hundred patients who had been studied in the psychiatric outpatient department of the University of Chicago Clinics were examined again in a follow-up interview at least one year after the time of their original visit to the clinic in an attempt to evaluate the results of treatment and to compare the original diagnoses with the diagnoses at the time of follow-up.

The main observations and conclusions are as follows:

1. Disturbances of both somatic and mental functions were complained of by patients in all diagnostic groups. Complaints of somatic dysfunction were not confined to any one of the organic systems or sensory modalities. The various disturbances of mental function occurred in all diagnostic groups, with the exception that delusions and hallucinations were not associated with the psychoneuroses or psychopathic personalities. A tendency for neurotic and psychotic reactions to be of a mixed character seems to be indicated by these observations.

2. Fifty-one of the 100 followed-up patients showed a degree of clinical improvement graded as 2 plus or better; i.e., they showed, at the minimum, definite improvement in one or more of the states listed as somatic complaints, mental symptoms or environmental difficulties, though some complaints still persisted. Thirty-six patients showed an improvement graded as 3 plus or better at the follow-up study. By "3 plus" is meant that the patient recovered from presenting symptoms with satisfactory resumption of occupational, familial and other duties unless subjected to severe stress. These figures compare favorably with the results reported by other authors and indicate the usefulness of "superficial" methods of psychotherapy in the treatment of psychiatric outpatients.

3. The necessity for careful and thorough recording of data relating to such topics as heredity, early behavior traits, personality, onset of present illness, etiology, prognosis, insight and diagnosis at the time of the original investigation of the patient's neurosis or psychosis seems readily apparent as a result of this study. In addition, the terms used in connection with all of

20. Curran, Desmond: The Problem of Assessing Psychiatric Treatment, *Lancet* 2: 1005-1009 (Oct. 30) 1937.

21. Luff, M. C.: Assessment of Psychiatric Treatment, *Lancet* 2: 1103 (Nov. 6) 1937.

22. Mapother, Edward, in discussion on Good, Thomas S.: *Brit. J. M. Psychol.* 7: 36 (June) 1927.

24. Wilson, E. B., and Deming, J.: Statistical Comparison of Psychiatric Diagnosis in Massachusetts State Hospitals During 1925 and 1926, *Bull. Massachusetts Dept. Ment. Dis.* 11: 6-19 (Oct.) 1927.

the topics just noted require careful definition before one embarks on any investigation of them.

4. The need of further studies of the neuroses as regards personality, the course of the illness and the results of various forms of treatment is emphasized by our experiences in this study and by the reports in the literature.

ABSTRACT OF DISCUSSION

DR. LLOYD H. ZIEGLER, Wauwatosa, Wis.: The authors are to be praised for attempting to follow psychiatric outpatients with the aim of evaluating the effects of therapy. They have been frank in emphasizing the many difficulties encountered which tend to detract from any substantial conclusions. What might have happened to an equal number of similar patients without any medical help whatever is a suggested control study which might modify their conclusions somewhat. All of us have seen a psychosis completely camouflage unrelated, serious disease of the body, and conversely we have seen a psychosis mimic serious disease of the body, much to the chagrin of physicians. The pattern that psychiatric disease assumes has embryonic roots, so to speak, in the psychobiology of the person. It is for this reason that psychobiology from a basic science standpoint is as important as histology. This means much more than detection or study of some neurotic traits of childhood. It means an appraisal of basic attributes and growth. A person develops variable degrees of stability between his external and his internal environment. The tendency to misinterpret either of these may result in a psychosis or neurosis. A psychosis and neurosis are not mutually exclusive and too much good effort has been expended in trying to establish their artificial boundaries in an arbitrary way, when in reality all important have been the subtle forces, in which cause and effect are indistinguishable, which have changed the person or rendered him disabled. We are gradually learning that words often conceal quite as much truth as they reveal. Part of the truth is as damaging as a falsehood. This seems particularly apropos in using words such as "personality types," "diagnostic nomenclature," "recovery," "prognosis," and a host of other terms. But we can in a crude way study man and animals too in some fundamental ways. Energy, activity, emotions, interests, man's facility with symbols in thought, memory or imagery—all these deserve understanding that we may know how man makes every conceivable type of adaptation, whether socially approved or not. Prognosis means to know beforehand. Experience will teach one that certain combinations of symptoms and signs usually disappear, while others do not. The criterion of being able to or having returned to accustomed occupation is a practical goal against which to evaluate prognosis in our work. Other criteria obtain, such as living outside a hospital, or return to preillness status, to be self supporting, to survive or to get along. The integrity of psychiatry will be furthered if psychiatrists give adequate attention, as the authors have done, to somatic as well as psychic aspects of personality function.

DR. WILLIAM NELSON, St. Louis: I think this paper rather illustrates the fact that we cannot classify mental illnesses accurately even after a long period of study in many instances and that, as far as present terminology is concerned, it does not answer the purpose adequately. I think also that the question of mental illness and the manifestation, as one sees it at different periods of the manifestation of it, is bound to shift in symptomatic manifestation. In other words, we shall frequently see psychoneurotic manifestations along in the course of more frankly organized mental states, and so, when it comes to a question of determining the nature of the disease from the basis of the manifestation at any one particular phase of it, it is very difficult to do. In the first place, we have multiple manifestations; in other words, we do have a mixed personality and the manifestation that occurs in the illness of the individual is going to be largely in pattern form similar to the reactions that the individual has engaged in in his normal life. I wish it were possible in my own reasoning to be able to state a justification for the work that I do. One of the most difficult things in practice is to be able to see who has improved and who has not. After all, the crucial test depends on social adjustment. Now

that is bound to be manifest in various sources and, depending on the breadth of experience of the individual, will be the possibility of evaluating his usefulness. The individual who has rather multiple relationships and does not retreat into some protected relationship is bound to be the one to whom this kind of comparison is going to apply more critically than to the individual who lives in a protected environment. The question then of evaluating treatment is largely open to dispute. I know of no way whereby the results of such treatment can be actually evaluated.

DR. WALTER FREEMAN, Washington, D. C.: I noticed in the tables that, of twenty cases of anxiety neuroses, ten were associated with some organic disease. Is this to be interpreted as a chicken-and-egg problem? Which came first, the neurosis or the organic disease? According to these statistics it would seem that the anxiety neuroses should be particularly investigated on account of the frequent concurrence of organic disease.

DR. U. G. DARLING, Chicago: The title of the paper is "Results of Treatment in a Psychiatric Outpatient Department," and the paper dealt principally with the resultant change in diagnosis. I wonder what type of treatment was used to bring about the change in certain individual cases, or is this just a report of a gradual, progressive change that came about through time and observation? I note also that it said "Relative to the associative qualities of somaticopsychic relationships due to the derangement of the autonomic system." It appears to me that many times we can arrive at an earlier diagnosis if we study carefully the autonomic reflex psychic disturbances rather than just simply analyzing the psychic.

DR. H. T. CARMICHAEL, Chicago: Dr. Ziegler raised the question as to what would have happened in a control series of cases in which no treatment was given. Of our series of 166, thirty-seven of the patients made only one visit to the clinic and received no treatment other than the psychotherapeutic effects which are inherent in any initial psychiatric interview. We compared the results in these patients with the results in patients who had made repeated visits to the clinic and found that the results were not nearly as good in the former group as in the latter. With regard to Dr. Nelson's comments, it was not our intention to imply that inadequacy of personnel led us to get these results. I do not feel that is the point at issue at all. I agree with him that we can justifiably raise questions about the adequacy of our present system of psychiatric nosology. As to Dr. Freeman's question about the twenty patients with anxiety states of whom ten showed evidences of organic disease, we were not able to decide which came first. Sometimes we felt that they coexisted; at other times we felt that one came first and the other followed, but we could not be sure and we do not feel ourselves in a position to make any flat statement in that regard. Dr. Darling is right in picking out the fact that our title emphasizes results and that we talk perhaps a little more about some other things than we talk about results. What we had in mind was to emphasize the great difficulties that are encountered by any one who attempts to make a study of results of psychiatric treatment. We did make a statement as to the various types of treatment used, but there were so many that we felt we could not evaluate any method individually. We used all the indicated medical and surgical measures and also all the superficial psychotherapeutic methods. We did not make any definite attempt to investigate the autonomic nervous system as such, but in our general investigation of these patients we took it into consideration.

Hugh Owen Thomas.—Now Hugh Owen Thomas was the son of a bone-setter who practiced in the same district of Liverpool in which his son afterwards lived and practiced. Moreover, Evan Thomas, the father, was the seventh bone-setter in lineal descent, the previous six having been farmers in Anglesey who also practiced the art of dealing with injuries. There is no doubt that they were held in high esteem, for one evening Sir Robert Jones showed me a series of cuttings from old newspapers extolling the services rendered by various generations of this family, and their virtues have been recorded in Welsh song.—Power, Sir D'Arcy: British Masters of Medicine, Baltimore, William Wood & Co., 1936.

BOTULISM: DEMONSTRATION OF
TOXIN IN BLOOD AND
TISSUES

HARRY J. SCHNEIDER, M.D.

AND

ROY FISK, Ph.D.

LOS ANGELES

The diagnosis of botulism is often difficult when the disease occurs in isolated instances. It is made largely on the history and the physical examination, confirmed whenever possible by the demonstration of the organism or toxin in the source of poisoning. In fatal cases even necropsy gives little pathognomonic evidence of this disease, although Schwarz¹ has recently called attention to certain histologic appearances in the central nervous system which he thinks may be specific of botulism. The demonstration of toxin in the blood or tissues in suspected cases, apart from the demonstration of *Clostridium botulinum*, should be of value in the diagnosis of the disease but as far as can be determined has not been successfully accomplished in this country.

It is generally believed that the amount of botulinus toxin necessary to produce symptoms in the patient is so minute as to preclude its detection in the blood. However, scattered attempts with variable results have been made in the past. Kob (1905) is quoted as having been the first to observe that botulinus toxin can be demonstrated in the patient. He succeeded in doing this with the blood of a child nine days after intoxication. Other European workers have found the toxin in the blood serum up to the twenty-fifth day. Bergman, Insulander and Lindblad² reported an outbreak of four nonfatal cases of botulism with characteristic symptoms of moderate degree. Botulinus toxin was demonstrated in the blood serum in two of these cases on the seventh day of illness and in the other two on the tenth day. Negative results were obtained, however, with the blood serum of the first two patients on the tenth day, after antitoxin (50 and 100 cc.) had been administered on the seventh day. The source of the toxin could not be demonstrated but they concluded that the poisoning was due to the ingestion of salted fish. Longo³ recently reported that the toxin was apparently demonstrated in the blood serum of a patient ill four days, by guinea pig injection.

In the American literature the only reports on this aspect of the subject have dealt with unsuccessful attempts to demonstrate the toxin in the blood of patients. Lindsay, Newman and Hall⁴ reported two fatal cases in which blood taken twenty minutes after death failed to show the presence of toxin when injected into guinea pigs in amounts of 1 cc. These investigators state that Glassman has in experimental animals demonstrated botulinus toxin in liver extracts. They say that this has never been adequately tested as a means of postmortem diagnosis in man but should be tried whenever possible.

From the laboratories of the Los Angeles County Hospital and the departments of pathology and bacteriology of the University of Southern California School of Medicine.

1. Schwarz, G. A.: Polioencephalomyelitis Due to Botulism, *J. Nerv. & Ment. Dis.* 86: 7-23 (July) 1937.

2. Bergman, R.; Insulander, S., and Lindblad, V.: Serologically Verified Epidemic, *Acta. med. Scandinav.* 81: 496-516, 1935.

3. Longo, D.: Serologic Test for Diagnosis: Value in Differentiating from Epidemic Encephalitis, *Policlinico (sez. prat.)* 43: 1355-1362 (July 27) 1936.

4. Lindsay, R. B.; Newman, J. R., and Hall, I. C.: An Outbreak of Botulism in Wyoming, *J. A. M. A.* 108: 1961-1964 (June 5) 1937.

REPORT OF CASES

Three fatal cases are here presented in which the botulinus toxin was demonstrated in tissue extracts in all three and in the antemortem blood of one:

CASE 1.—B. A., a Mexican laborer aged 39, entered the Los Angeles County Hospital May 2, 1938, with the history of refusal to talk. Because of a long past history of epilepsy with psychosis the first impression was that of hysteria, but the possibility of a foreign body in the throat was to be ruled out.

Physical examination, including laryngoscopy, was apparently negative. Within the next few hours the patient became stuporous and was found dead seventeen hours after entry and forty-seven hours after onset of symptoms.

The gross and microscopic postmortem examination gave essentially negative results except for marked hyperemia of the kidneys and partial pulmonary atelectasis.

Dr. Cyril B. Courville made the neuropathologic examination and reported the finding of multiple hemorrhages, cortical and in the perivascular gray matter, with congestion of the small vessels, with diffuse acute changes of the small pyramidal cells of the cortex.

No etiologic diagnosis was apparent eighteen hours after autopsy but information was available that the father of the deceased was showing similar symptoms. This aroused the suspicion of botulism poisoning as a probable diagnosis for both patients and investigation was immediately started in an effort to (1) disclose any possible source of contamination of food and (2) to demonstrate, if possible, the toxin in the deceased and in the living patient.

Although a thorough investigation was made by the public health authorities, the source of the toxin could not be determined. In investigating the possibility of active toxin in the organs of the deceased twenty hours after necropsy and twenty-six hours after death 50 Gm. of liver was triturated and extracted with 50 cc. of physiologic solution of sodium chloride; 1 cc. of this extract was injected intraperitoneally into each of two guinea pigs, one protected with 0.5 cc. of mixed antitoxin (A and B). After thirty-six hours the unprotected guinea pig developed experimental botulism and died forty-two hours after injection. The protected guinea pig appeared normal at this time but suddenly died a few hours later without the development of any signs of botulism. Graded doses of this extract, when injected into mice several days later, gave conflicting results, the evidence being suggestive but not conclusive.

CASE 2.—J. A., the 78 year old father of the first patient, became ill twenty-four hours after the onset of his son's symptoms. On admission his rectal temperature was 99 F., pulse rate 126 and respiratory rate 18 per minute. He was conscious and in no apparent pain but was having difficulty in breathing and swallowing and was able to answer questions only by nodding his head. The neck was not stiff and the pupils reacted to light, but paralysis of the internal rectus on the right was evident, as well as paralysis of the eleventh and twelfth cranial nerves and weakness of the intercostal muscles. The heart tones were normal. The blood pressure was recorded as 190 systolic, 120 diastolic. The blood Wassermann and Kahn reactions were negative. Although apparently in a terminal condition the patient was given 10,000 units of mixed botulism antitoxin (A and B) intravenously. Respirations ceased five hours after admission, the patient remaining alive in a Drinker respirator for another hour and dying six hours after entry and sixty hours after the onset of symptoms.

Blood collected at the time of admission to the hospital prior to antitoxin administration was tested for the presence of botulinus toxin in the following manner: Ten mice, five of which had been previously injected (fifteen minutes) with botulinus antitoxin (A and B) were injected intraperitoneally with 0.5 cc. of the citrated blood. At the end of thirty-six hours one unprotected mouse died and the remaining four showed symptoms of experimental botulism, viz. shallow breathing, muscular spasms, especially of the abdominal muscles, and later paralysis of the hind limbs and prostration. Three mice died in forty-eight hours and one sixty hours after injection. All of the protected mice survived without symptoms.

Necropsy in the second case was performed nineteen hours after death. Apart from arteriosclerotic changes consistent with the patient's age, the gross appearance of the viscera and tissues was similar to that of the first patient, with moderate hyperemia throughout, particularly in the meninges and kidneys.

Dr. Courville reported that the brain showed acute congestion with possible meningovascular syphilis.

Postmortem laboratory study in this case was more definite and enlightening. *Clostridium botulinum* was obtained post mortem on culture of stool and tracheobronchial secretions. Triturated liver extracted with saline solution yielded botulinus toxin, type A, as proved by mouse injections.

CASE 3.—R. C., a man aged 32, a Mexican, entered the hospital Feb. 6, 1939, with a three day history of dizzy spells, generalized weakness, sore swollen tongue and inability to talk. The patient was mentally alert. The rectal temperature was 99.2 F., the pulse rate 110 and the respiratory rate 24. No ocular disturbance was noted. The only positive manifestation was a reddened pharynx.

Twelve hours after entry the patient showed symptoms of respiratory failure and died within forty-five minutes.

Twelve hours after death an autopsy was performed by Dr. George Fein. The pathologic changes were confined to pulmonary atelectasis and moderate meningeal and visceral congestion. Cultures of the gastrointestinal tract and various organs were negative for *Clostridium botulinum*. Blood serum and spinal fluid in doses up to 1 cc. were injected into mice with negative results. However, a saline extract of triturated liver when injected into mice in doses of from 0.5 to 1 cc. produced experimental botulism with death in thirty hours with the larger dose and more than thirty hours with the smaller. Protected mice showed no symptoms.

Additional history was later available, indicating that on February 2 the patient had eaten one fig, which was home canned, and remarked that it was sour. The remaining figs had been discarded and therefore were not available for study.

In three recent nonfatal clinical cases seen in this hospital, circulating toxin could not be demonstrated. The attempts were made on the day of diagnosis, these being the third, fifth and eleventh day of illness respectively. The source of poisoning was traced to home canned string beans in two separate cases. Material was not saved for study but chickens partaking of the discarded food in both instances developed fatal limberneck and were in turn destroyed. No source could be determined in the remaining case.

COMMENT

The demonstration of toxin in the blood of one and in the tissues in all three of our fatal cases was of particular value, since efforts to find the source of poisoning were unsuccessful. Toxin was extracted from the liver and proved by animal inoculation in each of the fatal cases twenty-six, nineteen and thirty-seven hours respectively after death. Knowledge of the relative affinity of the toxin for the various organs would have been desirable. In case 3 attempts to determine this were unsuccessful because of changes in the material due to delay (eighty-five hours).

Of our three fatal cases a clinical diagnosis of botulism was made in only one instance (case 2) and circulating toxin successfully demonstrated. In three nonfatal clinical cases circulating toxin could not be demonstrated.

The work of Bergman and his associates² appears to have proved that botulinus antitoxin neutralizes the circulating toxin in man, but no information is available as to its effect on tissue fixed toxin. In case 2 toxin was demonstrated in the liver even though 10,000 units of antitoxin (A and B) had been administered five hours before death. Unfortunately we neglected to determine the presence of toxin in the blood at necropsy.

The value of the serologic and tissue extract procedures should be recognized by the clinician and pathologist who have had difficulty in making an exact diagnosis in cases of botulism.

It is hoped that this report may stimulate an interest in the practical value of these procedures and that further observations may elucidate the various questions here raised.

SUMMARY AND CONCLUSIONS

1. Five outbreaks of botulism with three fatal and three nonfatal cases occurred within a period of ten months in Los Angeles County.

2. Circulating toxin was demonstrated in the blood of one patient by animal injection and its specificity (type A) determined by toxin-antitoxin experiments. Circulating toxin could not be demonstrated in three nonfatal cases.

3. Toxin was demonstrated in saline liver extracts in all the fatal cases.

4. The demonstration of circulating or tissue toxin as herein described should aid in the diagnosis of botulism and we believe that such attempts are indicated in all suspected cases of botulism.

TWO RELATED OUTBREAKS OF FOOD POISONING ATTRIBUTED TO A *SALMONELLA* ORGANISM

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Directors of the Bureaus of Communicable Diseases, Food Control and Laboratories, Respectively

BALTIMORE

On June 14, 1938, several cases of acute food poisoning were reported to the city health department as probably having been caused by food or foods eaten at a wedding banquet on the evening of June 12. On interviewing the persons reported to be ill, we learned that others who had attended the banquet were similarly affected with acute gastro-enteritis. All told, 105 persons were said to have partaken of food at the banquet held following a wedding ceremony at a public hall in the city. By interviewing sixty-eight of the victims and through a questionnaire sent to sixteen persons residing out of the city, it was learned that seventy-nine persons were made ill. Two of the foods served at the banquet were eaten by all of the persons who became ill—cantaloup with blackberries and stuffed tomatoes with a liver paste. Simultaneously with this outbreak there were also reported several cases of illness with similar symptoms following a confirmation party held on the same day, June 12. At this party twenty-one children, ranging in age from 12 to 18 years, and two adults ate a meal that included celery with a filling of liver paste. Every one of these became ill. In neither outbreak were there any fatalities.

REPORT OF THREE TYPICAL CASES

The clinical course of several typical cases was supplied by the medical resident of one of the local hospitals:

CASE 1.—A housewife aged 38, admitted to the hospital June 15, complained of abdominal pain, vomiting and diarrhea. On Sunday June 12 she had attended a large dinner reception.

From the Baltimore City Health Department.

June 13 she had ten loose, watery stools without mucus or blood. Associated with diarrhea she also had abdominal cramps and vomited several times. The next day she felt feverish and the diarrhea continued. On admission the temperature was 102.4 F., the pulse 100, the respiratory rate 24 and the blood pressure 100 systolic, 80 diastolic. Physical examination was negative except for slight diffuse abdominal tenderness without muscle spasm or rigidity. The red blood cells numbered 4,400,000, the hemoglobin content was 92 per cent and the white blood cell count was 9,500. The urine was normal except for the presence of 2 plus acetone. In the hospital the patient was given 500 cc. of 10 per cent dextrose intravenously. The diarrhea yielded to camphorated tincture of opium and bismuth subnitrate. June 17 the temperature was normal and remained so until discharge. Examination of the stool showed no mucus, pus or blood. The patient was discharged June 20.

CASE 2.—A school boy aged 13, admitted to the hospital June 15, 1938, complained of abdominal pain and diarrhea. June 12 he had attended a reception. June 13 he began to have diarrhea and severe abdominal pains and he vomited twice. The day before admission his temperature reached 102 F.; on admission it was 100.4 F., the respiratory rate 24 and the blood pressure 108 systolic, 70 diastolic. Physical examination was negative except for slight diffuse abdominal tenderness. The red blood cells numbered 5,010,000, the hemoglobin content was 98 per cent and the white blood cell count was 6,450. Examination of the urine was negative. The stool contained no blood, mucus or pus. There was an elevation of temperature until June 16. During this time diarrhea continued, with six stools a day. June 18 the temperature was normal and the diarrhea yielded to camphorated tincture of opium and bismuth subnitrate. The patient was discharged June 20.

CASE 3.—A schoolboy aged 8 years, admitted to the hospital June 15, 1938, complained of abdominal pains and diarrhea. He had attended a large dinner reception June 12. The next day, June 13, he had severe abdominal cramps and from ten to fifteen watery stools. The next day he vomited a number of times and felt feverish. On admission his temperature was 100.4 F., the pulse 104 and the respiratory rate 24. Examination was negative except for slight tenderness in the epigastrium. The liver was felt one fingerbreadth below the right costal margin. The red blood cells numbered 5,300,000, the hemoglobin content was 115 per cent and the white blood cell count was 10,350. Examination of the urine was negative. On the day after admission the temperature was normal, diarrhea

TABLE 1.—*Wedding Banquet*

	Total	Ill	Not Ill
Total attending banquet interviewed.....	84	79	5
Tomatoes stuffed with chopped liver.....	79	79	0
Cantaloup and blackberries.....	82	79	3
Baked chicken and stuffing.....	75	71	4
Olives or celery or both.....	56	51	5
Soup.....	69	65	4
Vegetable salad (slaw).....	66	62	4
Potatoes, peas and carrots.....	74	70	4

and vomiting ceased and the patient complained only of occasional abdominal pains. He was asymptomatic June 17 and was discharged June 18. Examination of the stool showed no mucus, pus or blood.

The majority of the other cases were strikingly similar in their clinical course and all the patients recovered completely after about six days. The death of one of the persons ill was reported about two weeks later, but it was found that this patient, aged 55, had completely recovered from the food poisoning more than a week before and died of a chronic cardiac condition.

There was no evidence or history of blood in the feces of any of the patients.

The average incubation period was about nineteen hours. Most of the persons became ill the day after the meal at about 6 p. m. The shortest incubation period was four hours (reported in one case) and the longest incubation period was sixty-seven hours after the food had been eaten.

EPIDEMIOLOGY

The food for both the banquet and the confirmation party had been prepared on the same day by the same private caterer, a person previously unknown to the health department, who operated from a private home.

TABLE 2.—*Confirmation Party*

	Total	Ill	Not Ill
Total attending party interviewed.....	23	23	0
Celery stuffed with chopped liver.....	23	23	0
Tomato juice.....	20	20	0
Roast turkey and dressing.....	21	21	0
Fruit aspic.....	14	14	0
Custard pastry.....	11	11	0
Peas.....	18	18	0
Sweet potatoes.....	16	16	0
Orange ice.....	20	20	0

The food for the banquet consisted of cantaloup with blackberries, celery, olives, soup, baked chicken with stuffing, potatoes, peas and carrots, vegetable salad and tomatoes stuffed with liver paste. The only food served at the confirmation party that was served at the banquet was the chopped liver paste, with tomatoes in the first instance and with celery in the second instance.

In preparing the food the chickens were drawn and the livers of the fifty-five chickens were parboiled, chopped in a meat grinder and mixed with hard boiled eggs, chicken fat and soaked bread. This filling was prepared, according to the caterer, at about 8 or 9 o'clock on the morning of June 12. It was then mixed by hand by three food handlers. The rooms in which the food was prepared were in the basement of a private dwelling, and these rooms were lacking in sanitary conveniences and adequate refrigeration. The outdoor temperature on June 12 reached a height of 94 F. The liver filling, in fact, was not refrigerated at all from the time it was mixed in the morning until it was served at about 7 p. m. The quartered tomatoes were filled with the liver mixture after being transported to the banquet hall. They were served as a course with other food.

The results of the interview with eighty-four of the persons who attended the wedding banquet with regard to the food eaten and whether or not they were ill are shown in table 1.

It will be noted from table 1 that every one who ate the chopped liver became ill. As further evidence that the chopped liver was the cause of the outbreak, the five persons who attended the wedding dinner and did not eat of the tomatoes with liver filling in each instance gave a report of not having become ill.

The results of the epidemiologic investigation of the twenty-three persons who attended the confirmation ceremony are shown in table 2.

It is interesting to note that twenty-three persons attended this confirmation party, of whom only two were adults. As stated, every one present became ill and every one present ate celery stuffed with liver paste. This was the only item of the menu eaten by all who attended the party. One adult at this party ate only a

single portion of the meal, namely the celery stuffed with liver paste. This person became ill. Several persons present failed to eat at least one of the other foods served. This is in contrast to the wedding banquet, where a few failed to eat the liver filling and did not become ill. One adult who attended the wedding banquet was on a diet and therefore did not eat the infected food; several were late for the meal and the liver product had all been eaten, and these were spared the illness.

Investigation failed to reveal anything of significance at either party with regard to the age or sex distribution of the cases. The wedding banquet was attended primarily by young white adults of both sexes with a few of the older members of the families present. The confirmation party was attended by twenty-one children and two adults. Again, all who ate the liver paste filling became ill.

The food handlers who prepared the food—two Negro and one white all female—stated that they ate portions of all the food during the preparation on the morning of June 12 between 8 and 9 o'clock and did not become ill. This perhaps indicated that either the chopped liver became infected after preparation and during the storage period or the infection occurred during the preparation and increased during the storage time, probably as a result of the very warm weather.

LABORATORY OBSERVATIONS

Owing to the delay in receiving reports of the outbreaks, no food with the exception of some olives was available for laboratory examination. The olives were found to be practically sterile. Fecal specimens from the three food handlers, from four other members of the caterer's household and from twenty of the persons who were made ill were obtained and submitted for bacteriologic examination. The fecal specimens from the three food handlers, from one of the members of the caterer's household and from fourteen of the patients all contained organisms which were identical and which were found to belong to the *Salmonella enteritidis* but were not agglutinated by three different *Salmonella enteritidis* antisera. They were agglutinated, however, to a fairly high titer by an antiserum of *Salmonella newport*. Transfers of some of the cultures were sent to the Standards Laboratory of the Medical Research Council at Oxford, England. This laboratory reported that the cultures were identical with one another and with the *Newport* type.

COMMENT

The method by which the food became infected in these outbreaks cannot be definitely determined. Several theories may be advanced as to what actually occurred. Many investigators do not believe that carriers or subclinical cases of *Salmonella* infections are usually the means of spread of this disease. It is known that fowls and other animals are infected with one or more of the many organisms making up the *Salmonella* group. Therefore, several possibilities present themselves. First, that the chickens were infected at the time of purchase with a member of the *Salmonella* group of organisms and through careless and multiple handling the cooked chicken, especially the livers, became infected, the infection being transmitted to the food either by human hands or by improperly washed utensils. The warm weather, the type of food and the lack

of refrigeration, of course, made ideal conditions for the growth of the organisms. Second, rats were suggested as the mode of spread of this infection. Rat traps and evidences of rat infestation were noted in the cellar of the caterer. It was thought, therefore, that possibly the rats, acting as carriers, contaminated the food and were the basic cause of the infection.

This is all pure conjecture and, while proper refrigeration of perishable foods and cleanliness are both important and absolutely necessary, as shown in this case, another source of possible contamination of food may be present; that is, the contamination of well cooked food by poorly washed utensils or dirty hands directly from freshly killed fowl which had been previously infected by one of the organisms of the *Salmonella* group. Edwards¹ stated that *Salmonella newport* had never been reported in the United States prior to 1938. He has since, however, isolated this organism from the intestinal tract of a hen and also from a pullet, both of which were in flocks in which there was a high mortality.

SUMMARY

1. June 13, 1938, two large groups of persons became ill with gastro-enteritis, one group after a wedding banquet and one after a confirmation party.

2. The clinical course of all the cases investigated was strikingly similar, and recovery was complete after about six days.

3. The meals in both instances were prepared by a caterer previously unknown to the city health department. Sanitary conditions at the place of preparation were poor, the refrigeration was completely inadequate and the outside temperature reached 94 F. on the day the food was prepared.

4. Epidemiologic investigation definitely revealed that the liver filling was the cause of the illnesses at both affairs. For various reasons several persons who attended the wedding banquet did not partake of the liver and did not become ill. All who attended the confirmation ceremony ate the liver and all became ill.

5. None of the foods served, except the olives, were available for laboratory examination. Fecal specimens were obtained from twenty-seven persons. From stools of fourteen patients and of four other persons associated with the preparation of the food a *Salmonella* organism was isolated which was identified as *Salmonella newport*.

6. The methods of preparation and storage of the food and the warm weather were in themselves enough to cause the growth of bacteria and the production of toxins. Another source of infection has been suggested. Possibly some of the chickens were infected with a member of the *Salmonella* group at the time of purchase. The uninfected poultry may have been well cooked and properly prepared by the caterer. Unwashed utensils or human hands which had not been properly cleaned may have been the mode of transmission of the organism. The evidence of rat infestation at the place of preparation of the food gave rise to the thought that possibly these rodents had been the source of contamination of the food.

7. The outbreak again emphasizes the need for cleanliness, carefulness, refrigeration and experience on the part of persons engaged in the preparation of food for any large number of persons.

1. Edwards, P. R.: The Occurrence of *Salmonella Newport* in Domestic Animals, *J. Am. Vet. M. A.* 46: 192 (Sept.) 1933.

EXCISION OF THE PATELLA IN
ARTHRITIS OF THE
KNEE JOINT

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For many years the apparent futility of all forms of conservative management of relatively severe arthritis of the knee joints has stimulated the search for a possible surgical procedure which is less radical than fusion or synovectomy of the involved joint. Every orthopedic surgeon can immediately recall the vast number of patients he has treated for arthritis of the knees who after traction, immobilization by casts in the position of function, physical therapy, vaccines and eradication of foci of infection would return at variable intervals complaining of pain on motion, stiffness and recurring deformity. Careful elicitation of the patient's complaints almost invariably results in the information that the greatest pain is localized in the anterior part of the knee and is aggravated by active attempts at extension. This motion when possible is almost invariably associated with subpatellar crepitation and not infrequently is associated with gross, irregular, cog-wheel-like movements of the patella.

The increasing frequency of case reports concerning the excision of the patella for fracture and the clinical and experimental observations of Brooke in regard to the physiology and function of the knee joint following the excision of the patella for fracture led me to believe on a priori evidence that the same procedure would be applicable in carefully selected cases of arthritis of the knee joint. Before the publication of Brooke's report a personal communication from Mr. Constantine Lambrinudi informed me that he had used this procedure in five cases of arthritis of the knee joint, three of which were hypertrophic and two of the chronic rheumatoid type. He stated that he was highly satisfied with the resulting relief of pain and improvement of function.

Operative removal of the patella, either total or partial, has been done by many surgeons in the treatment of fractures of this bone.

Thomson¹ advocated the removal of the small fragments in comminuted fractures of the patella in a paper before the Section on Orthopedic Surgery in 1934.

Blodgett and Fairchild² reported a series of cases of fracture of the patella in which either the patella or some of the fragments were removed at operation. This procedure gave uniformly good results.

Several British surgeons employ it as a routine measure in treating fractures of the patella.

Brooke,³ of the Royal West Sussex Hospital, Chichester, England, has been employing this measure for a number of years and has reported thirty cases in which he has removed the patella for simple fracture, twenty-two patients being men and eight being women.

Hey Groves⁴ stated that "Brooke's assertions seemed absolutely incredible. However, examination of the operative results showed that they were correct. He undertook some anatomic investigations and found that

the quadriceps tendon passed well in front of the patella to join the patellar tendon. Hence the method suggested is perfectly justified."

Tippett⁵ stated that he agrees with the conclusions which Brooke has arrived at after using the procedure in three cases.

Others who have reported on the operative removal of the patellar fragments are Bissell⁶ and Whitelocke.⁷

In a personal communication of Dec. 31, 1938, Mr. Herbert Britain informed me that he has used this procedure fifteen times for fracture of the patella, ten times for osteo-arthritis, once for recurrent dislocation and once for osteomalacia. He feels it wise to confine the operation to patellar-femoral arthritis.

Excision of the patella for fractures associated with gunshot wounds of the patella was performed during the great war. The patella has also been removed for such conditions as primary osteomyelitis, tuberculosis, tumors and congenital dislocations.

Burrows⁸ has seen two cases in which different surgeons had removed the patella for recurrent dislocation. In each case the symptoms of recurrent dislocation of the extensor apparatus continued after the operation.

Tippett is surprised that more correspondents have not commented on what he considers the most important application of excision of the patella, namely, to relieve pain in early osteo-arthritis in the knee joint.

This is the particular phase to be considered in this paper. Although I have not had occasion to advise this procedure in cases of early osteo-arthritis, I feel that the procedure has a definite place in the therapeutic armamentarium of the surgeon in the treatment of certain cases of arthritis of the knee. The rationale depends on a thorough understanding of the anatomy, physiology and mechanics of the knee joint.

MORPHOLOGY OF THE PATELLA

Brooke has concluded that the patella is a sesamoid bone but there is no evidence that its development is a response to a functional need or that the bone serves any useful function when formed. He thinks it is an integral part of the skeleton phylogenically inherited.

Bernays and Kazzender have shown that the patella is neither developed nor situated in the quadriceps tendon but that its development is independent of and occurs behind this tendon.

This can readily be seen in a study of the knee joint of a 50 mm. embryo. Later in the development of the embryo the patella obtains attachment to the tendon.

COMPARATIVE ANATOMY OF THE PATELLA

Studies in comparative anatomy indicate that in animals function does not influence the development and growth of the patella. The functional activity of the quadriceps tendon in man increases from birth till adult life, and the relative size of the patella if governed by function should be proportionately larger in the adult. Actually it is relatively smaller. In the sloth, the mole and the echidna, all slowly moving animals, the bone is well developed, while in the fox, the deer and the leopard, all rapidly moving animals, it is proportionately small. In the kangaroo, in which there is enormous development of the quadriceps in conformation to the animal's mode of progression, the bone is completely absent.

Read before the Section on Orthopedic Surgery at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Thomson, J. E. M.: *J. Bone & Joint Surg.* 17: 431-434 (April) 1935.

2. Blodgett, W. E., and Fairchild, R. D.: *Fractures of Patella*, *J. A. M. A.* 106: 2121-2125 (June 20) 1936.

3. Brooke, Ralph: *Brit. J. Surg.* 24: 733-747 (April) 1937; *Proc. Roy. Soc. Med.* 30: 203 (Jan.) 1937.

4. Groves, E. W. H.: *Brit. J. Surg.* 24: 747 (April) 1937.

5. Tippett, G. O.: *Brit. M. J.* 1: 383 (Feb. 19) 1938.

6. Bissell, A. H.: *Am. J. Surg.* 40: 486 (May) 1938.

7. Whitelocke, Hugh: *Brit. M. J.* 1: 539 (March 5) 1938.

8. Burrows, H. Jackson: *Brit. M. J.* 1: 418 (Feb. 19) 1938.

De Vries has deduced from her studies that the bone is in the process of reduction in much the same way that the fibula is and considers this a strong point in favor of phylogeny as the determining factor for its presence.

In contrast to the concepts just cited must be considered the well known fact that in the human being born with genu recurvatum the patella fails to develop normally until the deformity is corrected and natural functional stresses are allowed to occur. This indicates that the size of the patella is governed in man by function. Hence it seems that for the present phylogeny may be considered as the determining factor for the presence of the patella and function the determining factor for its size in man.



Fig. 1 (case 2).—Appearance of soft tissue shadow of patellar and quadriceps tendons.

ROLE OF THE PATELLA IN THE MECHANISM OF THE KNEE JOINT

Lickey has pointed out that the patella apparently fulfils two functions in the knee joint. He suggests that the patella forms a much more suitable pulley for motion around the condyles of the femur than the tendon itself, because the upper end of the patella is kept in a plane well in front of the axis of flexion and extension. He considers the second function of the patella that of a lever of the first order acted on by a force at each end with a fulcrum at a varying distance between the two. His explanation of the mechanics of the knee joint is probably correct, and the pulley and leverage action with its alteration of the fulcrum in the knee joint is probably advantageous.

Theoretically and actually the presence of the patella enhances the power of the quadriceps and therefore serves a useful purpose. It must follow logically that

interference with its leverage action and alteration of the fulcrum would theoretically detract from the mechanical advantage in assisting movements at the knee joint. The problem is one of relativity because the patella is not essential for good knee function. This is shown by instances in which the patella is congenitally absent and will be shown by references to surgical literature concerning cases in which the patella has been operatively removed.

I have noted marked hyperplasia of the patellar and quadriceps tendon which began with the institution of active functional use of the extremity subjected to operation and continued for a variable period in each case. This was so marked in some cases that it could easily be seen on inspection. The change in the patellar tendon was demonstrated by a comparison of preoperative and postoperative roentgenograms, shown in figures 1 and 2.

EXPERIMENTAL INVESTIGATION OF THE IMPORTANCE OF THE PATELLA IN MOVEMENTS AT THE KNEE JOINT

Brooke investigated the importance of the patella in movements at the knee joint relative to the effects of its removal for fracture. From the postmortem room he obtained a number of knee joints in the fresh state. These were freed from all muscular attachments, with the exception of a short length of quadriceps tendon which was left attached to the patella. The specimens were then mounted on a stand in such a manner that the quadriceps tendon was connected by a cord passing over a pulley to a weight. A second weighted cord was attached to the anterior surface of the tibia and in turn passed over a reducing pulley and attached to a lever which recorded on a revolving drum. By means of this experimental setup Brooke determined that the absence of the patella enhanced the speed of motion at the knee joint, so that the time taken for movement of the leg from the horizontal to the vertical plane was about half the time required with the patella in situ. He also noted that when the leg was put through a complete range of motion, from active flexion to full extension, the time taken was less when the patella was excised than when it was in place.

EXCISION OF THE PATELLA IN CASES OF ARTHRITIS AND ITS EFFECT ON THE FUNCTION OF THE KNEE JOINT

It has been noted that moderate to marked improvement in function has resulted in each knee joint from which the patella has been excised for arthritis of the knee. The increase in range of motion and strength of the quadriceps group of muscles has been sufficient to be demonstrated by simple mechanical appliances. One appliance consists of a 5 pound weight so attached to the ankle by rope and pulleys that extension of the leg on the thigh lifts the weight a measured distance. It is then an easy matter to measure the relative strength of the extensors of the leg subjected to operation as compared with the strength of the extensors of the intact extremity, which is used as a control. In each case the power of extension of the surgically treated extremity was greater than in the extremity not so treated. This test was used only in cases of bilateral involvement in which operation was performed on the more severely involved extremity.

Another simple mechanical device was utilized to corroborate these observations. This was a lever

attached to a baseboard by a hinge. A spring balance scale was interposed between the ankle and the lever and was connected with each by a cord. The extremity to be tested was allowed to assume 90 degrees of flexion and in that position the toes of the foot were allowed to touch a wall lightly. The patient was instructed to hold the toes against the wall while force was exerted

against the free arm of the lever. The force necessary to pull the toes from the wall was then measured on the scale.

The same procedure was carried out on the intact extremity in cases of bilateral involvement. In each case it was found that the extremity could withstand greater pull than the extremity on which operation had not been performed.

My report concerns eleven cases of excision of the patella for arthritis of the knee. I feel that this procedure is not specific treatment of arthritis as such but rather a means of eradicating a definite mechanical impediment to function which results from the changes secondary to chronic arthritis.

The aim of the procedure, therefore, is not to obtain a

perfectly normal knee joint but rather to relieve the patient from having pain on making attempts at extension and to increase the range of motion. Thus the indications are rather clearly defined and must be closely followed if the procedure is not to fall into ill repute. For the purpose of this study I used only cases which satisfied the following criteria:

1. The duration of the disease was several years.
2. Repeated periods of conservative management resulted in improvement, and there were recurrences.
3. When bilateral lesions were present the more severely involved joint was chosen while the other was observed as a control.
4. The disease was quiescent at time of operation.
5. There was definite x-ray evidence of arthritis (hypertrophic or rheumatoid) such as diminution of the width of joint spaces and presence of marginal exostoses (fig. 3).
6. It was evident that extension of the leg on the thigh to 160 degrees would be obtained postoperatively.
7. The mental and physical state of the patient was good enough so that he would be able to stand and walk postoperatively.

ETIOLOGIC FACTORS

I decided early in the study to select all cases suitable for operation regardless of the primary etiologic factor involved. This was decided on because, as previously stated, the procedure was designed to eliminate mechan-

ical impediment to the function of the knee joint and was not aimed primarily against any specific disease state. Hence I included in this study four cases of atrophic arthritis, three cases of hypertrophic arthritis or combined arthritis, two cases of gonorrheal arthritis and two cases of traumatic arthritis.

There were four men and seven women. The youngest patient was 35 years old and the oldest 64 years. The average age was 49 years. The duration of the disease was from eighteen months to twenty-three years.

PATHOLOGY

At the time of operation the gross pathologic changes presented by arthrotomy were sufficient to explain the impairment of the function. These changes were present in the synovia, the articular cartilage of the patella and the femoral condyles as well as in the tibio-femoral joint.

In five cases hypertrophic synovitis was marked; in three cases the suprapatellar pouch was obliterated by a fibrotic fusion of its synovial walls. This apparently intimately connected the quadriceps tendon with the anterior aspect of the femur, which with the osseous changes present resulted in a loss of free motion of the quadriceps tendon and patella.

In eight cases osteophytes on the articular aspect of the patella impinged on corresponding osteophytes and marginal exostoses of the underlying femoral condyles.



Fig. 2 (case 2).—Appearance of patellar and quadriceps tendons after excision of the patella.



Fig. 3.—Typical appearance before operation.

In the articular cartilage of the femoral condyles there was frequently definite evidence of osteochondritis, with degeneration and loosening of circumscribed areas of cartilage from the underlying bone. In other cases the articular cartilage of the femoral condyles was definitely involved by panus formation, with subsequent thinning and in places loss of the articular cartilage. In these

areas the subchondral bone had definitely undergone hyperplasia resulting in elevated areas, so that an apparent plateau was formed which acted as an osseous block to the normal excursion of the patella.

SYMPTOMS

In general the symptoms were pain in the knees on attempts at active motion and loss of function, which the patients usually attributed to pain but was often found to be a manifestation of deformity as well as pain. No effort was made to itemize the individual symptoms. Flexion deformity was present in ten of the eleven cases and restriction of motion was present in all the cases.

PREOPERATIVE TREATMENT

It was considered essential that some mobility of the joint be proved possible before operative intervention was attempted. In cases in which a relatively fixed flexion deformity of less than 160 degrees was present it was considered advisable to obtain at least 160 of extension by traction, by wedge casts, by turnbuckle casts employing Turner irons or by Mommmsen's quengel method. It was deemed advisable to eradicate any foci of infection which might be present and might have an etiologic relationship to the arthritis.

OPERATIVE TECHNIC

The usual forty-eight hour preoperative preparation is employed. The operation is performed under a tourniquet. A vertical incision about 6 inches in length is centered over the patella. The skin margins are protected by towels. The incision is then carried down to the patella, which is enucleated by sharp longitudinal dissection of the tendinous fibers of the overlying quadriceps tendon.

On freeing the anterior surface of the patella the capsular attachment and synovia at the margins of the bone are easily severed. The longitudinal incision in the quadriceps tendon is then closed with a continuous chromic catgut suture. The superficial tissues are closed in layers without drainage.

On closure of the operative wound the limb is passively extended within the limits of safety. It is noted that the range of flexion is immediately definitely increased.

Postoperative immobilization either in a cast or by traction in a Thomas splint is used for a period of one week to ten days for the patient's comfort. Immobilization by massive cotton dressing might be as efficient.

POSTOPERATIVE TREATMENT

At the end of ten days the patient is encouraged to stand and bear weight and begin walking increasing distances daily.

In this series of cases there was no physical therapy other than active functional use of the extremity because of the inability of these patients to travel the long distances daily to the hospital. However, the results probably would have been attained at an earlier date if proper physical therapy could have been utilized.

In most of the cases in which the disability has been present over an interval of years, it has been deemed advisable to initiate weight bearing with the use of a posterior molded splint extending from the gluteofemoral crease to the ankle. This has been employed because of the marked atrophy of the thigh group of muscles.

Also these older patients are timid and require a little support in standing and walking to reestablish their confidence. This splint is dispensed with while the patient is abed and as soon as the postoperative reaction has completely subsided. It has not been necessary to use the splint longer than a few weeks.

COURSE AND PROGNOSIS

In general, all these patients have shown progressive improvement in ability to walk from early postoperative observation to the present time, which I attribute to diminution of pain, greater ability to maintain extension and greater range of motion. This observation is of interest as the improvement in ability to walk has occurred even though the condition was bilateral and only one of the extremities has been operated on. In support of this assertion is the fact that all the patients with both knees involved have repeatedly returned and requested a similar operation for the disability of the other knee.

In general the prognosis following excision of the patella for arthritis of the knee is good in regard to the relief of pain and increased function. It has been noted that in chronic multiple arthritis the general state of health is improved and also the joint manifestations of the disease are often ameliorated by changing the status from that of a helpless bedfast or wheel chair patient to that of an ambulatory person. This improvement was noted in each of my patients.

REPORT OF CASES

CASE 1.—P. P., a man aged 35, entered Cook County Hospital Oct. 25, 1937, because of inability to walk resulting from painful swollen knee joints. This patient had been employed as an orderly at the hospital during the previous six years. Four years before admission he had his first attack of arthritis, during which all his joints were involved. After his first attack he was repeatedly readmitted to the hospital because of recurrence of arthritis. On previous admissions flexion deformities of the knees were treated by traction and casts. During the last six months he had no recurrence of acute symptoms, and he returned at this time particularly for treatment of the knees since he could not walk because of pain and deformity.

The essential abnormalities were swelling of the knees and periarticular thickening of the soft parts, which were most marked on the right side. The left knee was held in 20 degrees and the right in 30 degrees. There was palpable crepitation of the joints on active motion. Flexion was possible to 90 degrees but was associated with pain.

X-ray study of the right knee revealed a narrowing of the patellar-femoral and the tibiofemoral joint spaces. A small osteo-arthritis spur was present at the distal margin of the articulating surface of the patella and at the anterior-superior margin of the femoral condyles. An osseous mass was present at the medial margin of the medial condyle (Pellegrini-Stieda disease).

On October 28 the right patella was excised and the following gross pathologic appearance of the knee joint was observed:

The synovia of the suprapatellar pouch was markedly hypertrophic and bright reddish brown. The articular surface of the patella was rough and revealed many areas, up to 8 mm. in diameter, devoid of cartilage. There was an exostosis at the inferior margin of the patella. The cartilage of the femoral condyles revealed osteochondritic areas, measuring up to 1 cm. in diameter, in which the cartilage was yellowish white and could be easily depressed by an instrument.

Microscopic examination of the synovia revealed round cell infiltration and focal hemorrhagic areas. Synovial cells were moderately hyperplastic.

The postoperative course was uneventful. The patient was discharged November 16. He was last seen April 3, 1939;

at that time the surgically treated right knee was relatively painless and could be actively extended to 170 degrees and flexed beyond a right angle. He has been able to walk since leaving the hospital, placing most of his weight on the right leg.

He desires a similar operation on the other knee, as he is of the opinion that he could resume his occupation thereafter.

CASE 2.—L. S., a man aged 48, entered the hospital March 29, 1938, because of inability to walk and pain in the knees, elbows and hands. He had his first attack of arthritis six years previously and had been a patient in the hospital on three previous occasions for the same trouble. On his first admission in 1932 he had had many teeth extracted and had received a series of typhoid vaccine injections intravenously as treatment for his arthritis. In 1934 and in 1936 he was again treated in the hospital for flexion contractures of the knees. This treatment consisted of traction, which was followed by the application of casts until the contracture was corrected.

He returned at this time because of recurrence of the flexion deformity, which was associated with such marked pain that he could not walk. The essential abnormalities were diffuse swelling and periarticular thickening of both knees, which were most marked on the right side. There were a 35 degree flexion deformity of the right knee and a 20 degree flexion deformity of the left knee. There was free flexion to 50 degrees bilaterally. Active extension was associated with marked pain, and palpable crepitation was present over each patella.

X-ray study revealed narrowing of the patellar-femoral and the tibiofemoral joint spaces. The articular surface of the lateral condyle of the right femur was flattened and showed circumscribed areas of decreased density with some marginal areas of sclerosis and irregularity.

On March 31 the right patella was excised. During anesthesia the left leg was manipulated into complete extension and immobilized in extension by a circular plaster cast.

The gross pathologic change noted at the time of arthrotomy was loss of cartilage on the articular aspect of the patella, and the exposed bone was eburnated. The synovial lining of the suprapatellar pouch was pale pink and moderately thickened.

The articular cartilage at the margins of the femoral condyles was eroded in places, exposing the underlying subchondral bone. Microscopic sections of the synovia revealed round cell infiltration.

This patient was last seen April 19, 1939. He has been walking since leaving the hospital April 13, 1938. He has active extension of the right leg to 170 degrees and free flexion to 100 degrees. Motions are almost painless and he has repeatedly requested a similar operation on the left knee.

SUMMARY

1. Excision of the patella was utilized in the treatment of eleven cases of chronic arthritis of the knee joint.
2. The results of this operation have been satisfactory in eight cases and only fair in three, which were not well selected. One patient was an old Negro woman with peculiar psychic traits who was operated on twenty months before this report. Another had a latent gonorrheal pelvic infection, and the third was operated on too recently (two months ago) for one to be certain of the result.
3. In this series of cases there has been no death, complication or aggravation of the original condition.

CONCLUSIONS

Chronic arthritis of the knee joints with disability which has not adequately responded to repeated applications of conservative therapeutic measures is a prevalent condition.

For this deplorable state I offer a possible operative procedure, i. e., excision of the patella, which others

have used and which at this time seems to be of definite value.

As far as can be determined to date, with proper regard to the definite indications for the operation there is little danger either to the patient or to the extremity.
122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. A. H. MEYER, Memphis, Tenn.: I have not had any experience with the removal of the patella. I am therefore placed in a peculiar position in opening this discussion. I have always been able to cope with comminuted fractures of the patella by removing a few small fragments and using a purse-string suture to hold the remaining ones. The results have been uniformly satisfactory. The procedure as suggested by Dr. Berkheiser appears to me to be a bit radical, but in view of his results one cannot with fairness say that he is on the wrong track. If one considers that the patella is a sesamoid bone, then nature has placed the patella here for a definite purpose from a functional and evolutionary standpoint. A patella also helps to form the capsule of the knee joint and is the only bone in the body which does this. In view of the fact that the patella is therefore a contributing part in the formation of the knee joint, it would appear that its removal would certainly upset the anatomic structure of this very important weight bearing joint. I have always felt that the patella gives greater leverage to the function of the quadriceps muscle and acts as a direct fulcrum. To remove this would appear to me on the surface not only to weaken the joint but to put the extensor power of the quadriceps at a distinct disadvantage. From the clinical angle, I can readily understand that with excessive bone growth both on the patella and on the articular edges of the femur the patella under these circumstances would mechanically block motion in the knee joint and also, with the incongruity of the articular surfaces, produce pain on movement; therefore, on these bases removal of the patella would obviate these factors. About eighteen months has elapsed since Dr. Berkheiser's first operation of this nature, and I feel that sufficient time has not yet passed to tell what the final result will be. I mean that functionally it is too early to come to a conclusion and evaluate properly this method. More time should be given and these cases followed to decide ultimately the true value of the operation. Far be it from me to disparage Dr. Berkheiser's idea and his procedure. I merely wish to say that excision of the patella appears to be a rather radical operation; nevertheless, may I say that Dr. Berkheiser's end results are most illuminating and in this country he may be the pioneer who has led us across the new frontier to the fertile plains of peace and comfort for these unfortunate suffering individuals.

DR. JACOB KULOWSKI, St. Joseph, Mo.: This procedure did seem a little radical at first, but the subject has been worked up so thoroughly that the procedure should be given very careful consideration. I was particularly impressed with the indications for operation. My experience has been with certain cases of so-called counter mollities of the patella, which I described about six years ago, and I mention this because in these cases—there were three or four at the time—the lesion was confined solely to the patella articular cartilage, and in those cases the entire articular cartilage and the contiguous bony surface were resected. At the time I thought that the procedure was a little radical. I think now that perhaps it was not radical enough.

DR. FRANK G. MURPHY, Chicago: With Dr. Berkheiser's permission, I will answer Dr. Meyer's question. Recently I examined a case of bilateral osteo-arthritis of the knees with Dr. Berkheiser. One side had been operated on. There was fairly free movement on this side but I did not think the strength in the knee was quite equal to that of the untreated side. However, the extent of motion was much increased and the motion through this range was freer than that on the other side. The patient expressed a desire to have the operation

performed on the other knee when he got around to it. A question I wish to ask Dr. Berkheiser is Do you perform any further operative procedure in these cases, such as synovectomy or trimming away of some of the osseles that seem to limit motion in these knees? Another matter that deserves special mention is that the scope of application of this procedure is not limited to arthritis or to fractures of the patella. I have excised the patella in doing an arthroplasty of the knee joint. I think it simplifies the operation and allows a number of short cuts by eliminating the necessity of trimming out and placing fascia between the patella and the underlying condyles.

DR. J. ALBERT KEY, St. Louis: It seems to me that Dr. Berkheiser did not mention the work of Dr. Blodgett of our own society, who is a pioneer in the removal of the patella and reported a series of cases before this group, all of which I believe were for fractures of the patella. Also Dr. Thompson has been progressively removing the patella for fracture for some years. Theoretically this operation is a poor operation but practically it works. That is the important thing. When I read Brook's paper I just did not believe it, but I got into a hole not long ago in lengthening a quadriceps tendon by Bennett's method and to my surprise found the patella ankylosed by bone to the femur, which I had not known until I was about half through operating. I took the patella out and the patient does not miss his patella at all; in fact, he is better than he would be had I left it in.

DR. JOHN P. STUMP, New York: The primary thing I want to know is what Dr. Berkheiser means by "conservative management preoperatively." As I saw his roentgenograms, he showed some knees with considerable destruction of the joints apparently due to atrophic arthritis, and one or two cases with osteoarthritic changes, and some with but little bone change. I have not removed patellas for any type of arthritis, so I have no experience in that regard; however, I have been interested in patients with painful knees who present symptoms of tenderness anteriorly and pain posteriorly, as the author described. I have relieved many of them by correcting the static strain. A pronated foot causes a tremendous strain on the internal lateral ligament and that strain in turn causes an irritation of the synovial membrane, causing a synovitis which gives symptoms such as Dr. Berkheiser described. I have given tremendous relief to the patients and in a number of cases if "cure" were not such a big word I would say "cured" them by merely correcting their weight bearing and removing the strain from the internal lateral ligaments. I should like to ask Dr. Berkheiser whether he has included this type of treatment in his preoperative management.

DR. GARRETT PIPKIN, Kansas City, Mo.: Lambernudi in London hunted up two cases for Jesse Nielsen and me a year or two ago in which operation had been done several years before. Both patients had good functional results, considering the amount of destruction the knee had suffered prior to operation.

DR. E. J. BERKHEISER, Chicago: It is true that this operation seems a little radical and unanatomic, but we are all familiar with the removal of the sesamoids around the great toe and other places without any particular harm being done. So far as the strength of the knee is concerned, these knees were no good to begin with. They had strength but they were painful. After their removal they had a sufficient amount of strength so that the patients could walk better, a thing which they could not do before. I was asked why I had not operated on the second knee. All the persons who have had bilateral involvement on whom I have operated on one knee have returned requesting the operation on the second knee, and I have had considerable difficulty dodging this second operation because I wanted to keep it as a means of control, so to speak. Dr. Murphy asked whether there were not further operations. I have done nothing but this simple removal of the patella, in contrast to synovectomy or other procedures, merely because I wanted to find out what would happen in these knees with just the simple excision of the patella. Dr. Key brought up the point that I had not mentioned Dr. Blodgett's work and Dr. J. E. Thompson's work. My article was too long. It is included

in the complete article. Several of these references are included but I did not have the time to mention them. Dr. Stump brought up the point about what physical effort had been made in the conservative management. I mentioned that we had done all manner of conservative procedures in the way of correcting the flexion deformities at the knee. These patients had had everything given to them, vaccines and all sorts of eradication of foci and all types of medication as well as all the physical therapy methods with different lights and heats. True, we have altered the shoes and made attempts at the correction of static deformities. These measures were beneficial to many of these patients, but really only for a temporary or a short period of time. On the other hand, these same individuals would return after varying periods of time with their same disability of their knees. These were not recent cases with minor bits of pathologic change in the knee, but they were rather extreme types of pathologic change. The period of duration was from a year and a half to sixteen years.

INCIDENCE OF ANESTHETIC EXPLOSIONS

PHILIP D. WOODBRIDGE, M.D.

BOSTON

The Committee on Anesthesia Accidents of the American Medical Association¹ stated in 1930: "Explosion is statistically today the least of the hazards of anesthesia." In comparison with such causes of surgical and anesthetic death as pneumonia, shock, hemorrhage, embolus, overdose of anesthetic and asphyxia from respiratory obstruction, the incidence of explosion is still so small that it may be classed with the rare complications.

Although statistically their importance is minute, they are of great emotional importance. The dramatic nature of the accident and of the death that may occur leads to publicity. The noise, the dramatic suddenness and the publicity all tend to produce a wave of fear, and under the emotional tension of fear it is felt that something must be done, and done quickly. The thing that is done not infrequently turns out to be quite illogical. Thus in one hospital after a nitrous oxide-ether explosion the use of ethylene was prohibited but that of all other agents and methods was permitted! Other instances of equally illogical action could be cited. The emotional response to explosion is in great contrast to the attitude toward other causes of death during or following operation. Although mortality rates from postoperative pneumonia and from surgical and anesthetic shock, which are a few hundred times the explosion rate and many more times the explosion death rate, cause some degree of concern, they are accepted with comparative calmness. Certainly any recurring cause of accidental death should be carefully investigated and, if possible, eradicated.

QUESTIONNAIRE

After the fatal cyclopropane explosion at the Lahey Clinic in October 1938,² an immediate need was felt for information to serve as a logical basis for determining future policy with regard to all inhalation anesthetics. We needed to know not how many explosions, fatal and not fatal, there had been with various

From the Department of Anesthesia, the Lahey Clinic.
1. Henderson, Yandell: The Hazards of Explosion of Anesthetics. *J. A. M. A.* 94: 1491 (May 10) 1930.
2. Woodbridge, P. D.; Horton, J. W., and Connell, Karl: Prevention of Ignition of Anesthetic Gases by Static Spark. *J. A. M. A.* 113: 749-744 (Aug. 26) 1939.

gases, but the incidence of such explosions, the incidence of resultant death and the opinion of the anesthetists of this continent concerning the advantages of certain of the drugs and the advisability of continuing their use. For this purpose a questionnaire was sent to 100 physicians specializing in anesthesia in this country and in Canada. No anesthetist's name was included or avoided because he was known to have had an explosion.³ The list was compiled from four sources: anesthetists certified by the American Board of Anesthesiology, those certified by the American Society of Anesthetists, those who were known to have had long experience, and others known to be using a variety of anesthetic agents, including cyclopropane. An effort was made to obtain satisfactory geographic distribution. Eighty-seven of the 100 blanks were filled out and returned. Therefore there was little or no distortion of the statistical result through a selective factor determining failure to fill out the questionnaire. There may have been some distortion in an unknown direction from the fact that the blanks were sent only to physicians specializing in anesthesia. No attempt was made to include all reported explosions, because a representative, unbiased sampling was desired.

OPINIONS CONCERNING HAZARDS

The question was asked "In comparing cyclopropane with ethylene, do you believe cyclopropane possesses definitely greater explosion hazard? about the same

TABLE 1.—*Explosion Hazard of Cyclopropane*

	Explosion Hazard of Cyclopropane Is		
	Greater Than	Same as	Less Than
Hazard of ethylene.....	13 votes	44 votes	21 votes
Hazard of nitrous oxide-oxygen-ether (closed).....	19 votes	57 votes	7 votes
Hazard of ether (open).....	50 votes	16 votes	20 votes

hazard? or definitely less hazard?" A similar question was asked substituting for the word "ethylene" the phrase "nitrous oxide-ether (or oxygen-ether), given by the closed method"⁴ and a third question substituting "open drop ether." The results are given in table 1. The consensus is that cyclopropane, ethylene, nitrous oxide-oxygen-ether and oxygen-ether, given by the closed method, all present about the same explosion hazard and that open drop ether is safer in this respect.

COMPARATIVE ADVANTAGE OF CYCLOPROPANE

To determine whether anesthetists felt that cyclopropane was or was not superior to other anesthetics in any important respects, the following question was asked: "In regard to the ultimate welfare of the patient and the advantages to the surgeon, do you believe that cyclopropane, as contrasted to the other anesthetics that are available, offers great advantages to many patients or to a few patients, moderate advantage to many patients or to a few patients, slight advantage to many patients or to a few patients, or no advantage?" The phrasing of this permitted the anesthetist to check one or more answers. Thus he might indicate that he

considered it of great advantage to a few patients and of slight advantage to many. The replies as given in table 2 indicate a body of opinion overwhelmingly favorable to cyclopropane.

To determine how anesthetists felt with regard to the single factor of explosion hazard of cyclopropane as contrasted to its advantages, the following questions

TABLE 2.—*Advantage of Cyclopropane*

	Cyclopropane Offers	
	To Many Patients	To Few Patients
Great advantage.....	51 votes	23 votes
Moderate advantage.....	23 votes	4 votes
Slight advantage.....	3 votes	4 votes
No advantage.....	0 votes	0 votes

were asked: "Do you believe cyclopropane should be abandoned because of the explosion hazard? Do you believe cyclopropane should be abandoned for other reasons?" The results, given in table 3, are almost unanimously in favor of the continued use of cyclopropane. The number of votes cast against it is three, not five, for the two who voted against it "for other reasons" are among the three who voted against it "because of the explosion hazard." It is worthy of mention that, of these three, one had used cyclopropane but five times, another had used it "very few" times and had had one ether fire, and the third had not used it at all but had had two explosions with ether!

INCIDENCE OF EXPLOSIONS

In order to learn the frequency of explosions of various anesthetics in relation to one another and to the total number of administrations, these questions were asked: "About how many times has ether (all methods and combinations) been administered by you or under your supervision? How many explosions resulted? How many were killed by explosions? How many severely injured?" A similar set of questions was put with regard to ethylene, and another for cyclopropane. The results are shown in table 4. The replies cover about one and three-fourths million administrations of ether, one-third million of ethylene and one-fourth million of cyclopropane. The apparent explosion rates are respectively 1.73, 2.44 and 3.85 per hundred thousand administrations. The standard deviations due to

TABLE 3.—*Status of Cyclopropane*

	Should Cyclopropane be Abandoned	
	Yes	No
Because of explosibility?.....	3 votes	50 votes
Because of other reasons?.....	2 votes	76 votes

chance, shown to the right of these figures in table 4, are of such magnitude that the differences in these apparent rates are not significant. That is, the total number of explosions in these two and a third million administrations is so small that, if there were similar series covering ten or fifty or a hundred times as many explosions it might be found that the apparent rates shifted their relative positions, so that, for example, ether might have a higher rate than cyclopropane. So far as this questionnaire is concerned, it can only be

3. The one exception to this was that the Lahey Clinic data were included.

4. In the closed method there is no intentional escape of gases after the first few minutes of anesthesia. Exhaled gas passes through soda-lime or other chemical absorber to remove exhaled carbon dioxide. The method may be used for any inhalation anesthetic and is almost always used for cyclopropane.

said that all rates are very low and that they all fall in the neighborhood of two to four per hundred thousand.

In addition there were other reports in which the number of administrations was not given. These are shown in boldface in table 4. Thus there were thirteen additional explosions of ether among an unknown number of ether administrations reported by eleven anesthetists, two of ethylene by seven anesthetists, and none of cyclopropane by four anesthetists. Furthermore, twenty anesthetists stated that they had not used ethylene, and two that they had not used cyclopropane.

In these two and a third million anesthetics two people were killed by explosions. The mortality rate from explosion therefore appears to be extremely low. One of these was killed by an ether explosion, the other (the Lahey Clinic patient) by cyclopropane. These figures are so extremely low that it cannot be stated whether the mortality rate is greater for one of these drugs than for the other. In fact the figures both for apparent explosion rates and for deaths are such as to indicate that their occurrence is due to chance rather than to any important factor or factors which might function in relation to one of the drugs and not in relation to another.⁵

It may be assumed that the bulk of the ether administrations were by open drop, the ethylene by machine with constant or intermittent flow and escape or with the closed system with carbon dioxide absorption, and cyclopropane by the closed system. The open method probably increases the explosion hazard by allowing the heavy ether vapor to flow over the floor of the room toward distant sources of ignition and decreases it by using air as the diluent. The closed method probably

are considered to be equally dangerous as regards the explosion hazard. Open drop ether is considered to be safer.

In comparison to other anesthetics, cyclopropane is believed to offer moderate to great advantages to a large proportion of patients.

Among two and a third million administrations, the explosion rates of ether, ethylene and cyclopropane were all very low, and all fell in the neighborhood of from 2 to 4 per hundred thousand anesthetics. The explosion mortality rates were too low to be figured from the data available, since there were but two deaths in the two and a third million cases.

Clinical Notes, Suggestions and New Instruments

PAROXYSMAL LACRIMATION DURING EATING AS A SEQUEL OF FACIAL PALSY SYNDROME OF CROCODILE TEARS

LESTER ALLEN RUSSIN, M.D., IOWA CITY

My purpose in this report is to call attention again to an interesting condition of which only eight cases have previously been reported in the literature (Bogorad,¹ 1926, one case; Kroll,² 1929, one case; Kaminsky,³ 1929, two cases; Ford,⁴ 1933, four cases).

Essentially, the condition consists of a paroxysmal lacrimation every time the patient salivates during eating. It was called the "syndrome of the crocodile tears" by Bogorad, for the crocodile was formerly believed to weep hypocritical tears while devouring its victims. It occurs only after peripheral facial nerve palsies. It is not to be confused with lacrimation immediately after typical Bell's palsies, in which an ectropion is present permitting tears to run out of the conjunctival sac. In the following cases and those reported in the literature no ectropion is present and the tear duct puncta are patent.

The reader is referred to the article by Ford, who reviews the literature and interprets the observations.

REPORT OF CASES

CASE 1.—History.—W., a medical student aged 30, came to the receiving ward in September 1937 complaining of excessive lacrimation every time he eats certain foods. The past history revealed a vague history of a fall with a severe bruise on the head at the age of 14. As far as the patient could remember there was no period of unconsciousness or vomiting. It seems that several months later the patient noticed that, every time he ate, tears would brim over the right eye and run down the cheek. This condition has persisted until the present time. I have noticed the patient in the doctor's dining room during the lunch period. He can be seen sitting at the table holding his napkin close to his right eye, constantly dabbing away the tears. This condition, he states, is aggravated by sour, salty or bitter tasting foods. Mechanical stimulation of the mouth does not produce tearing.

Physical Examination.—The patient was well developed and well nourished. The right side of the face was obviously abnormal; the right palpebral fissure was smaller than the left. The right nasolabial fold was deeper than the left. There was no ectropion. When the patient was told to show his teeth,

TABLE 4.—Explosion Rates

	Replies	Adminis- trations	Explo- sions	Explosion Rate per 100,000	Killed	Injured
Ether.....	76 (11)	1,795,342 ?	31 (13)	1.73 ± 0.31	1	5
Ethylene.....	59 (7) (20)	326,798 ? None	8 (2)	2.44 ± 0.86	0	2
Cyclopropane....	51 (4) (2)	250,785 ? None	10 (0)	3.85 ± 1.22	1	0

decreases the hazard by confining the gases within the machine and increases it by using oxygen as a diluent. Some anesthetists, however, are in the habit of using air as the diluent for cyclopropane. If the ether had also usually been administered by the closed method with oxygen as the diluent, the results might have been different. This questionnaire throws no light on the influence of these factors.

SUMMARY

A questionnaire was sent to 100 anesthetists who had achieved recognition, and the eighty-seven replies that were received indicated the following:

Ethylene, cyclopropane and ether (given with oxygen or with oxygen and nitrous oxide in a closed system)

5. Yandell Henderson¹ quoted figures from questionnaires concerning ethylene sent by W. J. M. Scott to surgeons and by Hugh Cabot to hospitals. The former showed 163,000 administrations with eighteen explosions (rate 11.04 = 2.61 per hundred thousand) and one death; the latter 146,000 administrations with three explosions (rate 2.06 = 1.19 per hundred thousand) and number of deaths not stated. Nothing was said concerning the presence or absence of any selective factors in the method of collecting these figures which might have influenced the results.

Reported from the Receiving Ward, Cincinnati General Hospital.
1. Bogorad, F. A.: Das Syndrom der Krokodilstränen, *Vruch. dila* 11: 1328 (Sept.) 1928; cited by Kaminsky.³

2. Kroll, M.: Die neuropathologischen Syndrom zugleich Differentialdiagnostik der Nervenkrankheiten, Berlin, Julius Springer, 1929, p. 222.
3. Kaminsky, S. D.: Ueber das Syndrom der Krokodilstränen, *Deutsche Ztschr. f. Nervenhe.* 110: 151, 1929.

4. Ford, R. E.: Paroxysmal Lacrimation During Eating as a Sequel of Facial Palsy (Syndrome of Crocodile Tears); Report of Four Cases with Possible Interpretation and Comparison with Auriculotemporal Syndrome, *Arch. Neurol. & Psychiat.* 29: 1279-1288 (June) 1933.

he wrinkled his forehead and closed the right eyelid at the same time. This extension of the innervation to all portions of the facial musculature did not occur at all times. Under varying circumstances the innervation was more or less complete at different times.

Also when told to wrinkle his forehead the patient would show his teeth a little and close his right eyelid. This was done invariably. In other words, the patient could not innervate any one part of his right facial muscles without more or less innervating the total right facial musculature. The muscular tonus on the right side of the face was increased.

Chemical Tests.—Acid, salt or bitter substances produced a collection of tears in the right conjunctival sac, which would fill up and overflow, running down the right cheek. No other substances would produce this effect. Masticatory movements had no effect on the lacrimation. Substances with strong flavors had no effect. Sensation of taste was preserved on both sides of the tongue.

The cranial nerves were normal. Motor power and the sensorium were normal. Reflexes were normal. The medical examination otherwise was negative, including Wassermann, urine and blood tests.

The consulting ophthalmologist reported that the fundus was normal. The tear duct was probed and found to be normal.

Electrical tests were not done.

CASE 2.—History.—L. H., a Negro woman aged 27, suddenly noticed on Dec. 1, 1937, that her face was drawn to the right side. Three weeks later she had periods of forgetfulness which lasted several days. Then suddenly she had an attack of unconsciousness and convulsions with loss of sphincter control, and biting of the tongue. This dramatic episode followed an injection of neorarsphenamine. During the next week several more seizures occurred, one of which did not render her unconscious. When seen in the neurology clinic Jan. 13, 1938, the patient presented right facial weakness, staggering to the right side, pain on the right side of the face, and deafness in the right ear with tinnitus. There was no past history of epilepsy or convulsions as a child. However, there was a history of trauma to the head about the middle of October 1937 without loss of consciousness.

The neurologic examination revealed (1) negative eye-grounds; (2) the pupils dilated, the right fixed; (3) ptosis of the right eyelid; (4) paralysis of the seventh nerve; (5) sensation slightly diminished in the ophthalmic division of the fifth nerve; (6) definite diminution of hearing in the right ear; (7) palate going up in the midline; (8) gag reflex present on both sides; (9) motor division of the fifth nerve normal; (10) loss of taste on the right side of the tongue; (11) reflexes normal, with none abnormal; (12) sensorium unaltered except for the ophthalmic branch of the fifth nerve; (13) position sense normal; (14) no change in past pointing; (15) rapid movements unaltered.

Dr. Fabing, consultant neurologist, believed at this time that the patient had a peripheral lesion in the cerebellopontile angle or in the internal auditory meatus. The patient was admitted to the house in the neurology service for a complete work-up. Dr. C. D. Aring saw the patient in neurologic consultation and it was his impression that the patient had meningeal syphilis, basilar and vertical. Repeated Wassermann tests finally showed, on two occasions, plus 1 for cholesterinized antigen. Subsequent blood Wassermann tests were negative and all spinal punctures were negative. (In December 1934 the blood Wassermann reaction was negative. The spinal fluid Wassermann reaction was negative except for increased globulin.)

The patient was referred to the venereal clinic for antisyphilitic treatment in spite of the seronegative Wassermann reaction.

May 3, 1938 (six months had elapsed since the previous admission), the patient was seen in the receiving ward complaining of excessive lacrimation every time she ate certain kinds of foods. Salty and bitter foods caused tears to well up in the right eye and run down over the cheek.

Physical Examination.—The patient, though 27, looked fifteen years older. The right side of her face was obviously abnormal. There was a ptosis of the right eyelid, and the right palpebral fissure was smaller than the left. The right nasolabial fold was deeper than the left. There was no ectropion. Examination of the facial muscles revealed that the patient could not innervate any single muscle of the face without innervating all of them. For example, when told to show her teeth, the patient wrinkled her forehead and closed her right eye.

Chemical Tests.—Acid, salt and bitter substances produced lacrimation in the right eye and not in the left eye. Any other substances produced no effect. Masticatory movements had no effect on the lacrimation. Aromatic spirit of ammonia and other substances with strong odors did not produce any tearing.

Other Cranial Nerves.—1. The eye-grounds were normal. 2. The pupils were dilated, the right fixed. 3. Sensation was slightly diminished over the ophthalmic division of the fifth nerve. 4. There was definite diminution of hearing of the right ear. 5. The palate went up in the midline. 6. The gag reflex was present on both sides. 7. The motor division of the fifth nerve was normal. 8. There was loss of taste (?) on the right side of the tongue. 9. The superficial and deep reflexes were normal; there were no abnormal reflexes. 10. The sensorium was unaltered except for the ophthalmic branch of the fifth nerve. 11. The position sense was normal. 12. There was no change in past pointing. 13. Rapid movements were unaltered.

Medical examination was otherwise negative, including Wassermann, spinal puncture, blood and urine. Vestibular tests revealed normal vestibular responses.

The Weber test showed lateralization to the left: Air conduction was greater than bone conduction on the left. There was no air conduction on the right. Nerve deafness was present on the right. The tear duct was probed and found to be patent.

COMMENT AND SUMMARY

The probable explanation for the abnormal associated movements of the face, advanced by Spiller and cited by Ford, is that "The regenerating nerve fibers have become misdirected so that they no longer reach the muscles which they formerly supplied but are scattered at random over the face. The bundle of fibers which innervated the orbicularis oculi, for example, before the facial paralysis developed, is distributed among all the facial muscles during regeneration, and hence nerve impulses flowing along these fibers will cause a diffuse reaction." This is attested, for instance, by the fact that each time the patient tried to show his teeth he closed his eye on the affected side. Increased facial tone results because each facial muscle receives the same number of impulses as the whole facial musculature would receive under normal circumstances.

The lacrimation during salivation can be explained in a similar manner. It has been stated by competent observers that the seventh nerve also supplies secretory fibers to the lacrimal gland, by way of the sphenopalatine ganglion and the zygomaticotemporal nerve, as well as motor fibers to the face and sensory fibers to the anterior two thirds of the tongue and salivary glands. Any derangement of the seventh nerve would therefore affect all these simultaneously. It naturally follows, if the theory is correct, that when the fibers regenerated to the lacrimal gland some of the fibers destined to the salivary glands were misdirected. And some of those fibers that formerly supplied the salivary glands now supply the lacrimal gland as well.

Ford states that perhaps the reason why paroxysmal lacrimation does not occur more frequently, since facial palsies are common, is that it may occur but is not severe enough to warrant relief. Also that the lesions in the cases previously reported by Ford and others are located in an unusual site, probably proximal to the geniculate ganglion. Case 2 in this paper seems to bear out this assumption.

It is hoped more cases will appear in the literature to cast more light on this unusual and interesting phenomenon.

Children's Hospital.

Council on Pharmacy and Chemistry

STILBESTROL

PRELIMINARY REPORT OF THE COUNCIL

STILBESTROL is a name given to a recently developed synthetic estrogen—diethylstilbestrol—which is reported to be remarkably effective when administered orally. The unusual therapeutic results and the convenience of administration are conducive to widespread interest in the substance. In common with other estrogens, animal experiments indicate that stilbestrol may be carcinogenic under certain conditions. Evidence has appeared which indicates that toxic reactions are associated with the use of this substance. In this regard Dr. Eugene F. Du Bois, a former member of the Council, generously offered to submit to the Council results of an experimental investigation on stilbestrol performed by Dr. Ephraim Shorr and others, principally at Cornell University and the Rockefeller Institute for Medical Research. The results, appearing in a manuscript which was especially prepared for the purpose of publication as a Council report, indicate that in the hands of these investigators a large percentage of their patients developed toxic reactions of several sorts, including nausea, vomiting, cutaneous eruptions and possibly liver damage. The experiences with stilbestrol obtained by this group of investigators have not, however, been duplicated by some other workers. The reports of work conducted in Europe and, to a lesser degree, in this country, have indicated for the most part that the toxic reactions of stilbestrol were limited to gastrointestinal distress in from 5 to 15 per cent of the patients treated and that some of this distress disappeared on further medication. Shortly after the manuscript of Shorr et al. was received, Dr. C. L. Buxton and Dr. Earl T. Engle submitted a report to the Council on the effects of stilbestrol, which is based on observations of a few very carefully observed patients. These authors find little evidence that stilbestrol is more toxic than other estrogens.

An additional report on this substance in the form of a preliminary statement by Drs. Cyril M. MacBryde, Harold Freedman and Ellen Loeffel was also submitted to the Council. These authors obtained results similar to those of Drs. Buxton and Engle.

The Council authorized publication of the reports entitled "A Clinical Study of the Synthetic Estrogen Stilbestrol," by Drs. Shorr, Robinson and Papanicolaou; "Effects of the Therapeutic Use of Diethylstilbestrol," by Drs. Buxton and Engle, and the preliminary statement "Studies on Stilbestrol," by Drs. MacBryde, Freedman and Loeffel. In so doing, the Council wishes to point out that considerable more experimentation is necessary. It is well to await the outcome of further investigations which are being made in institutions which have facilities for proper experimentation and observation. Because the product is so potent and because the possibility of harm must be recognized, the Council is of the opinion that it should not be recognized for general use or for inclusion in New and Nonofficial Remedies at the present time and that its use by the general medical profession should not be undertaken until further studies have led to a better understanding of the proper functions of such drugs.

The Council expresses its thanks to Drs. Shorr, Robinson and Papanicolaou, to Drs. Buxton and Engle and to Drs. MacBryde, Freedman and Loeffel for their generous cooperation in making the reports available, and authorizes publication of these reports as preliminary statements on the status of Stilbestrol.

PAUL NICHOLAS LEECH, Secretary.

A CLINICAL STUDY OF THE SYNTHETIC ESTROGEN STILBESTROL

EPHRAIM SHORR, M.D.

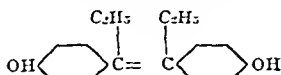
FRANK H. ROBINSON, M.D.

AND

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NEW YORK

In 1938 Dodds, Goldberg, Lawson and Robinson¹ announced the synthesis of a new estrogenic agent, diethylstilbestrol (4:4-dihydroxy-alpha:beta-diethylstilbene). As can be seen from its formula,



it does not contain the phenanthrene ring system formerly thought to be necessary for estrogenic activity.

Dr. Robinson died November 22.

This study was aided by a Grant from the Josiah Macy Jr. Foundation. From the New York Hospital, the Departments of Medicine and Anatomy of the Cornell University Medical College, and the Hospital of the Rockefeller Institute for Medical Research.

This is an extract from the complete paper. Reprints of the article will contain the omitted paragraphs and particularly much of the tabular material. The photomicrographs will appear in the reprint also.

1. Dodds, E. C.; Goldberg, L.; Lawson, W., and Robinson, R.: Estrogenic Activity of Certain Synthetic Compounds, *Nature*, London **141**: 247 (Feb. 5) 1938.

It was found an extremely powerful estrogenic agent in animals, suffering little diminution in potency by the oral as compared to the parenteral route.² It reproduced the effects of the natural estrogens in animals and was about two and one-half times as active as estrone by injection. By the oral route the superiority over the natural estrogen was far greater, since the naturally occurring compounds lose a high percentage of their activity when given by mouth. In man the loss of activity of the natural estrogens given by mouth has been shown to be as much as 95 per cent, as judged by vaginal smears.³

These attributes of the new compound, its high estrogenic activity, its oral efficiency and its cheapness gave promise of a wide usefulness in human therapy. Preliminary experiments on animals had indicated that it was devoid of toxic effects.

Two groups of English investigators, working under the auspices of the Therapeutic Trials Committee of the Medical Research Council, reported very favorably on a trial of the synthetic estrogen in two series of women. Stilbestrol produced all the effects observed with natural estrogens, including the relief of the menopausal syndrome. In the group studied by Bishop, Boycott and Zuckermann⁴ some by-effects in the form of nausea and vomiting were noted in three of forty-six patients receiving stilbestrol. In the series reported by Winterton and MacGregor⁵ comprising fifty-one women, some of the patients experienced slight nausea during the treatment but in only one case was the drug poorly tolerated.

More extensive clinical studies, while confirming the estrogenic properties of the compound and the attendant relief of menopausal symptoms, have indicated a far higher percentage of unpleasant side reactions than those reported by the English investigators. Varangot⁶ found severe gastrointestinal reactions in eight of eighteen women. Ehrhardt, Kramann and Schäfer⁷ also report a large number of unpleasant side effects, which, however, they incline to attribute to overdosage (from 2 to 3 mg.).

To present a detailed review of the extensive literature on the clinical use of this compound is beyond the scope of this article. Many workers regard the side effects to be significant enough to condemn stilbestrol for human use.⁸ Others feel that they can be avoided by proper doses.⁷ Kellar and Sutherland⁹ state that the toxic effects following oral administration can be eliminated by employing the intramuscular route. This observation is in accord with the views of several workers who regard the toxic effects as due to local action on the mucous membrane of the gastrointestinal

2. Dodds, E. C.; Lawson, W., and Noble, R. L.: Biological Effects of Synthetic Estrogenic Substance 4:4'-dihydroxy-alpha:beta-diethylstilbene, *Lancet* **1**: 1389 (June 18) 1938.

3. Papanicolaou, G. N., and Shorr, Ephraim: Action of Ovarian Follicle Hormone on Ovarian Insufficiency in Women as Indicated by Vaginal Smears, *Proc. Soc. Exper. Biol. & Med.* **32**: 585 (Jan.) 1935; Action of Ovarian Follicular Hormone in Menopause, as Indicated by Vaginal Smears, *Am. J. Obst. & Gynec.* **31**: 806 (May) 1936.

4. Bishop, P. M. F.; Boycott, M., and Zuckermann, S.: Estrogenic Properties of "Stilbestrol" (Diethylstilbestrol): Clinical and Experimental Investigation, *Lancet* **1**: 5 (Jan. 7) 1939.

5. Winterton, W. R., and MacGregor, T. N.: Clinical Observations with Stilbestrol (Diethylstilbestrol), *Brit. M. J.* **1**: 10 (Jan. 7) 1939.

6. Varangot, J.: Clinical Use of Stilbestrol, *Lancet* **1**: 296 (Feb. 4) 1939; Activité oestrogène et toxicité du stilbestrol (4:4' Dihydroxy alpha:beta Diethylstilbene), *Presse méd.* **38**: 725 (May 13) 1939.

7. Ehrhardt, K.; Kramann, H., and Schäfer, H.: Vorläufige klinische Ergebnisse mit oestrogenen Stilben-Präparaten, *München. med. Wchnschr.* **86**: 261 (Feb. 17) 1939.

8. Buschbeck, H., and Hausknecht, K.: Ueber die Wirkung von Stilbestrol beim Menschen, *Klin. Wchnschr.* **1**: 10 (Jan. 7) 1939.

9. Kellar, R. J., and Sutherland, J.: New Synthetic Estrogen—"Stilbestrol": Therapeutic Trials Committee of Medical Research Council, *J. Obst. & Gynaec. Brit. Emp.* **46**: 1 (Feb.) 1939.

tract. It has also been reported that with continuation of treatment the unpleasant by-effects tend to disappear.¹⁰

Equal lack of agreement is seen in the reports of toxicity studies in animals. They uniformly confirm the estrogenic activity of the compound and reveal an extraordinary similarity in action to the natural estrogens. Such widely diverse effects of the natural estrogens as the increased fat and calcium content of cock blood,¹¹ the inhibition of the response of the pigeon crop-gland to prolactin¹² and the sensitization of the infantile rabbit uterus to progesterone¹³ are imitated. But in contrast to the early indications of its harmlessness, Loeser¹⁴ noted in rats decreased appetite, epistaxis, vaginal and intestinal hemorrhages, fatty degeneration with subsequent necrosis of the liver, enlargement of the adrenals with arterial hyperemia and bleeding, and enlargement of the spleen with hemorrhagic reaction in the islands. According to Krietmair and Sieckmann¹⁵ the administration of from 0.5 to 1.0 mg. per gram to mice resulted in death in ten to sixteen days. In rats from 1.5 to 5 mg. per gram resulted in paralysis and death in an hour. Tislowitz¹⁶ observed a disturbance of the myelogenic system, and granulocytopenia and anemia in dogs receiving 5 mg. by injection for from twenty-five to fifty days. Morrell,¹⁷ on the other hand, has failed to observe any pathologic changes in the tissues of rats, rabbits and monkeys.

In the face of such conflicting reports it is obvious that much more knowledge of the properties of this compound will be needed before either condemning it for human use or making it generally available for estrogenic therapy.

EXPERIMENTAL SUBJECTS AND METHODS

The studies were carried out on forty-four women, many of whom had been previously treated with the natural estrogens estrone and estradiol benzoate. There were two cases of primary amenorrhea in young women (aged 19 and 22) in whom secondary sex characteristics and uterine growth had already been achieved by previous treatment with natural estrogens. Withdrawal bleeding had fairly regularly followed the administration, for periods of two weeks, of sufficient estrone or estradiol benzoate to induce a follicular vaginal smear. In the absence of treatment the vaginal smears were of the typical atrophic type we have already described as characteristic of this variety of amenorrhea.¹⁸ The remaining forty-two were cases of the menopausal syndrome, of which fourteen were spontaneous, three followed irradiation and twenty-five were associated with the removal of the uterus, ovaries or both.

The stilbestrol was obtained from two sources and administered orally in oil and in pill form, plain or enteric coated, and intramuscularly in oil. Occasion-

ally intramuscular injections of stilbestrol were alternated with amniotin or estradiol benzoate. During these periods the patients were kept unaware of the change in medication.

The vaginal smear method of evaluating estrogens in man, introduced by Papanicolaou and Shorr,³ was employed as the objective index of the action of stilbestrol. This method had been employed also by the English investigators, so that a comparison of results on this basis was possible. The smears were obtained at frequent intervals, usually three times weekly. In instances in which studies were made of comparative estrogenic potencies with the natural estrogens, daily smears were taken. Several vaginal biopsies were taken to compare the hypertrophy induced by stilbestrol with that following the natural estrogens. The smears were used to guide dosage and to compare the subjective response with the morphologic changes induced by the drug. We have already pointed out³ that there is no necessary correlation between the degree of symptomatic improvement and the extent of the smear change. The level of the smear change at which amelioration of symptoms takes place varies with the individual patient. With some, complete relief is obtained with slight changes in the smear; with others, a complete follicular change must be brought about. Most cases fall between these two extremes. The follicular stage represents full replacement with estrogenic hormone equivalent to "one human unit." It therefore serves as a measure of the estrogenic potency of a preparation and permits a simple and accurate comparison of the relative strength of the various members of this group of hormones. It will help in the interpretation of the data if these considerations are borne in mind.

The patients were seen at weekly intervals and an evaluation was made as to the effect of the medication on the menopausal symptoms. Side effects of the drug were made note of, the smears were read and further treatment was prescribed. From time to time hepatic function studies were carried out. Wherever possible, these studies were made before treatment was begun, at the end of the course and during a rest period. Often this could not be done, either because the patient could not spare the time out of working hours or because of unwillingness to repeat the tests because of the previous discomfort.

Two tests of liver function were employed, namely the sodium benzoate test as devised by Quick¹⁹ and the bilirubin tolerance test.²⁰ In the former test the patient is given 5.9 Gm. of sodium benzoate orally, and the total urine excreted during the next four hours is collected. This urine is concentrated and acidified, precipitating the hippuric acid. It is then filtered and the residue is washed with cold water. The hippuric acid residue is then dissolved in hot water and titrated with standard alkali. The amount of hippuric acid present is calculated and reported as grams of sodium benzoate. The normal individual excretes at least 3.4 Gm. of the 5.9 Gm. given in four hours. Since the excretion might be decreased in renal insufficiency, a urea clearance test is run simultaneously.

The bilirubin tolerance is performed by first determining the bilirubin blood level. One mg. of bilirubin per kilogram of body weight is dissolved in sterile 0.1 molar sodium carbonate and given intravenously. The

10. Winterton and MacGregor.³ Kellar and Sutherland.⁹
11. Zondek, B., and Marx, L.: Induction of Lipemia and Calcemia in Cock by Means of Estrogenic Hormone, *Arch. Internat. de pharmacodyn. et de therap.* 61: 77 (Jan. 31) 1939.

12. Folley, S. J., and Watson, H. M. S.: Some Biological Properties of Diethylstilbestrol, *Lancet* 2: 423 (Aug. 20) 1938.

13. de Friemery, P., and Gerling, M. C.: *Acta brev. Neerland.* 9: 17, 1939.

14. Loeser, A.: Untersuchungen über die Pharmakologie und Toxikologie synthetischer Brunststoffe (4,4'-Dioxy-alpha-beta-Diäthylstilben), *Ztschr. f. d. ges. exper. Med.* 105: 430 (April) 1939; abstr., *Zur Pharmakologie und Toxikologie des 4,4'-Dioxy-alpha-beta-Diäthylstilbens (Diäthylstilbestrol)*, *Klin. Wchnschr.* 18: 346 (March 11) 1939.

15. Krietmair, H., and Sieckmann, W.: Ueber 4,4'-Dioxy-alpha-beta-Diäthylstilben, eine synthetische Verbindung mit der Wirkung des Follikelhormons, *Klin. Wchnschr.* 18: 156 (Feb. 4) 1939.

16. Tislowitz, R.: *Acta brev. Neerland.* 9: 15, 1939.

17. Morrell, J.: *Endocrinology*, to be published.

18. Shorr, Ephraim, and Papanicolaou, G. N.: Action of Gonadotropic Hormones in Amenorrhea as Evaluated by Vaginal Smears, *Proc. Soc. Exper. Biol. & Med.* 41: 629 (June) 1939. Papanicolaou and Shorr.³

19. Quick, A. J.: Clinical Value of Test for Hippuric Acid in Cases of Disease of Liver, *Arch. Int. Med.* 57: 544 (March) 1936.

20. Harrop, G. A., Jr., and Guzman Barron, E. S.: Excretion of Intravenously Injected Bilirubin as Test of Liver Function, *J. Clin. Investigation* 9: 577 (Feb.) 1931.

blood bilirubin level is then determined after five minutes and again after four hours. The percentage of bilirubin retention:

$$\frac{\text{Value of third—1st}}{\text{Value of second—1st}}$$

Normal retention is less than 5 per cent.

Whenever possible, the dose of stilbestrol aimed at was that which would produce, in addition to symptomatic relief, a typical follicular or "estrus" smear. In a number of patients, comparison was made of the relative potencies of stilbestrol by the oral and the intramuscular route with estrone, estradiol benzoate, estradiol propionate and ethinyl estradiol.

The data have been assembled in table form. [Tabular material will appear in the reprint.]

ANALYSIS OF RESULTS

1. *The Estrogenic Activity of Stilbestrol.*—That stilbestrol is a powerful estrogenic agent is apparent from inspection of the data assembled in table 2. The changes induced in the vaginal smear and epithelium are comparable to those brought about by the natural estrogens. Typical follicular smears resulting from both stilbestrol and estradiol benzoate administered to the same subject (case 5, menopausal castrate) are illustrated (figs. 1-5), as well as biopsies of the vaginal epithelium taken at the same time as the smears.

Of the forty-four cases treated with stilbestrol, such follicular smears were induced in eight. In seventeen others quite advanced prefollicular smears were seen. In two no changes occurred, probably as a consequence of the small amount of drug administered because of the patients' intolerance. The remaining sixteen showed intermediate changes. The correlation between the degree of smear change and the level of dosage of the synthetic estrogen bears out what we had previously observed with the natural estrogens, namely a considerable variation from patient to patient in the dose required to bring about a complete estrogenic effect. While the degree of smear change is roughly proportional to the dosage of stilbestrol, the influence of the individual sensitivity to the drug is quite apparent.

There were, however, certain differences in the smear changes induced by the natural estrogens and the synthetic one. These lay chiefly in the frequent failure of increasing doses of stilbestrol to bring about progressive changes in the smear picture (cases 6, 8, 26, 27, 28, 33, 35, 37, 39, 40, 41, 42, 43). Indeed, in several instances (cases 14, 15, 29, 30) actual regressions took place during the administration of the same or even higher doses.

This phenomenon may signify the acquisition by the body of some means of dealing with the compound so as to render it less active. This suggestion is based in part on evidence from perfusion experiments that the liver is capable of removing large amounts of natural estrogen from the circulation. The loss of about 95 per cent of the activity of the natural estrogens estrone and estradiol, which we have noted in the human being, finds a reasonable explanation in these experiments, since the estrogens would reach the liver immediately after absorption from the intestinal tract, presenting an opportunity for partial inactivation before entering the general circulation. The initial absence of a similar mechanism for dealing with the synthetic estrogen may be responsible for the fact that this compound loses little of its potency when taken orally. The subsequent diminution in oral efficiency in the cases cited might be due to the development, after a time, of some such mechanism for the inactivation of the compound.

In addition to the vaginal smear changes, evidence for the estrogenic activity of stilbestrol is furnished by the several cases of withdrawal bleeding in our series. Bleeding after cessation of therapy took place not only in the menopausal group but also in the two cases of primary amenorrhea studied. In case 1, withdrawal bleeding, quite scanty in amount, and of from two to three days' duration, followed two of the three courses of stilbestrol. In case 2, bleedings of from three to five days' duration followed in each of two cases. Both young women had been treated over a long period with natural estrogens, with the regular appearance of bleeding of about the same duration and character on cessation of treatment.

In contrast with the natural estrogens estrone and estradiol, stilbestrol loses little of its activity by mouth. Equivalent smear changes were induced, orally, by from one to two times the amount administered intramuscularly as compared with from fifteen to twenty times the amounts of natural estrogens required orally. Stilbestrol, however, suffers by comparison with ethinyl estradiol, the oral activity of which in the three cases studied was four and a half, seven and twenty times as great. The lower figures are probably the more accurate ones. Unfortunately, the unpleasant gastrointestinal reactions to this preparation make prolonged studies rarely possible. The greater potency of ethinyl estradiol as compared with stilbestrol in the human subjects contrasts with the animal assays,²¹ which found stilbestrol three times as active. This discrepancy indicates the necessity for human assay studies. A comparison of the oral activity of estrone and stilbestrol in one case showed the latter to be about six times as active.

By the intramuscular route, estradiol benzoate would appear to be more active than stilbestrol. One mg. of estradiol benzoate is equivalent to 6,000 rat units. On the basis of the three cases studied, its estrogenic activity would appear to be from three to four times as great as stilbestrol by injection. With respect to estrone by the same route, 1 mg. of stilbestrol brings about smear changes equivalent to about 2,500 rat units, or 1.7 mg.

From these experiments it becomes apparent that the chief advantage of the synthetic estrogen lies in its greater immunity to destruction by the oral route than the natural estrogens. This highly desirable property, combined with its low cost, would make it highly advantageous for human use were it not accompanied by very unpleasant side effects, the toxic nature of which may be suspected.

2. *The Subjective Effects of Stilbestrol.*—There is general agreement that stilbestrol, in addition to paralleling the biologic effects of the natural estrogens, is capable of ameliorating the subjective symptoms of the menopause. The results of the treatment of forty-two women with the menopausal syndrome have been condensed in table 3 from the data detailed in table 1. Except in four cases (cases 11, 22, 28, 36), in which insufficient treatment was given because of intolerance to the drug, the medication was associated with from partial to complete amelioration of the usual menopausal symptoms, the flush, headache, depression, and so on. In most instances the degree of relief experienced corresponded quite well with the extent of the vaginal smear change. However, it was often difficult to evaluate the effect of the drug on symptoms other

21. Emmens, C. W.: *J. Physiol.* 94: 22P (Dec.) 1933, quoted by Dodds, E. C.: *Stilbestrol*, *Practitioner* 142: 309 (March) 1933.

than the flush because of the frequency with which the medication was accompanied by unpleasant side effects. Even in the absence of definite discomfort, many patients were struck with the marked improvement in well-being which followed the substitution of the natural for the synthetic estrogen. This change may have been due to relief from an ill definable discomfort produced by stilbestrol rather than to a qualitative difference in its action on the menopausal symptoms as compared with the natural estrogens.

No such agreement exists as to the incidence and significance of the side or "toxic" effects resulting from the use of stilbestrol. Bishop, Boycott and Zuckermann report transitory nausea in one and vomiting in two of forty-six cases studied and express the opinion that these effects should not be considered a contraindication to the use of this preparation as an estrogenic agent. Winterton and MacGregor, treating fifty-one cases, reported slight nausea in six, which disappeared shortly despite continuation of the drug by mouth. One patient experienced slight nausea after injection, and one tolerated both forms of treatment badly. Kellar and Sutherland found the nausea by the oral route transitory and state that it could be eliminated by changing to the intramuscular route. On the other hand, Varangot noted severe gastrointestinal symptoms in eight of eighteen women, and Loeser in six of fifteen. Other workers cited also stress the high incidence of gastrointestinal symptoms.

Our results have been compiled in table 1 and condensed in table 4. Of the forty-four cases treated, toxic symptoms were absent or trivial in only nine, comprising 20 per cent of the cases. In fourteen cases (32 per cent) the drug had to be stopped because the symptoms were intolerable. In twenty-one cases (48 per cent) the drug could be continued despite the discomfort, either because of the coincidental relief of menopausal symptoms or because the patient was unaware of the connection of the medication with the symptoms. Toxic side effects, therefore, occurred in 80 per cent of the cases. The relative incidence of the different symptoms is shown in table 4.

The nausea was of all degrees of intensity, sometimes constant, sometimes occurring in waves. Vomiting either was frank or took the form of regurgitation of a clear, sweetish watery fluid. One patient (23) regurgitated moderate quantities of fluid six times during a twenty minute interview. The abdominal distress varied from uncomfortable distention after meals, epigastric pain and cramps to an intense searing sensation "as if there were a burning fluid moving about in the intestine." There was one case of severe bloody diarrhea (case 9).

Lassitude of varying intensity occurred in thirty-two cases (72 per cent). While frequently most noticed after meals in the form of an uncontrollable drowsiness and lethargy, it was occasionally present throughout the day. Some patients said that they felt as if they had been drugged. A peculiar restlessness sometimes accompanied the lassitude, which made it very difficult to relax and give way to sleep.

There were eight skin rashes noted. One (case 33) consisted of extensive areas of diffuse brawny erythema, hot to the touch, involving the back of both upper arms, and the front of the thighs just above the knees. It disappeared within two days of stopping the medication. Another (case 23) took the form of an itchy papular eruption involving the neck, shoulders and upper part of the back. The remainder were less

extensive and consisted of small macular erythematous patches associated with considerable pruritus.

The one toxic psychotic reaction in this series is of particular interest. During the second week of treatment, while the patient was receiving 2 mg. daily by mouth, her husband called the clinic to say that his wife was behaving queerly. She was seen by Dr. George Henry, of the psychiatric division, to whom we are indebted for the following summary:

The patient is tense and somewhat apprehensive and presents spasmodic coarse tremors of various parts of her body. She claims she has great difficulty in controlling herself. She says "Yesterday I cracked up. I get that vague feeling in my head and then I go haywire. I feel disconnected (lower abdomen) as though my legs didn't belong to me—only at times. Yesterday I was laughing and crying. A week ago after a neighbor told me about the Germans, I wanted to stick a knife in myself." She had an impulse to break the window and use the glass to make vaginal smears. After talking with the physician she felt more calm.

The impression was of acute, mildly delirious reaction in an emotionally unstable person. Present medication should be discontinued.

TABLE 4.—*Subjective Effects Following Administration of Stilbestrol*

(Menopausal syndrome = 42 cases)
(Primary amenorrhea = 2 cases)

Extent of Effect	Relief of Menopausal Symptoms	Toxic or Side Effects					Miscellaneous
		Nausea	Vomiting	Abdominal Distress	Diarrhea	Lassitude	
0	4	7	30	13	37	12	Skin rashes = 8
+	4	6	3	11	3	4	Psychotic reaction = 1
++	5	11	5	14	3	12	Vertigo = 6
+++	14	12	3	6	0	16	Marked thirst = 1
++++	14	8	3	0	1	0	Paresthesias = 2
Toxic reactions							
Number.....		37	14	31	7	32	
Percentage...		84	32	70	16	72	

It was three weeks after treatment was stopped before the symptoms had disappeared completely.

Finally there were six cases of vertigo, two paresthesias (cases 3 and 12), and one patient who complained of intense thirst (patient 13) of a few days' duration. One of Loeser's patients also complained of "unquenchable" thirst after an injection of 2 mg. of stilbestrol.

Several of the authors cited describe the side effects as generally of a transitory character, the patients acquiring a tolerance with continued administration of the drug. Such was not our experience, in the main, with this group of patients. While this is occasionally seen (cases 13, 14, 15, 18, 30), as a rule the symptoms persisted throughout treatment in one form or another. They sometimes disappeared temporarily to recur suddenly, without there having been any change in dosage (cases 4, 27). A second course of treatment was tolerated just as poorly as the first (cases 3, 4, 7, 9, 14, 16, 23, 29, 35, 41, 42). There would appear to be little support for the suggestion that one may anticipate the development of a tolerance for the drug.

The suggestion has also been advanced that the side effects of stilbestrol are due to local irritation of the gastric and intestinal mucosa. This concept is contradicted by the large number of severe reactions encountered when the drug was given intramuscularly. This

was particularly striking in cases 9, 16, 22 and 23 when without the knowledge of the patient single injections of stilbestrol were given at intervals during a course of treatment with amniotin (estrone). In these cases each injection of the synthetic estrogen was followed within two or three hours by severe toxic reactions.

Finally, the side effects cannot be correlated with the dose employed in the sense that there is a critical level, e. g. 2 mg. as has been suggested, below which they do not occur. They may be present with doses of 0.5 mg. and absent when as much as 5 mg. is given (cases 9, 18 and 42).

TABLE 5.—Results of Hippuric Acid Excretion Test and the Intravenous Bilirubin Tolerance Test in Cases in Which Stilbestrol Was Administered

Case No.	Stilbestrol		Before Stilbestrol		At End of Therapy		1 to 4 Months After Stilbestrol Retention	
	Mg.	Days	Bilirubin Retention, per Cent	Hippuric Acid, Gm.	Bilirubin Retention, per Cent	Hippuric Acid, Gm.	Per Cent	Gm.
17	..	..	4.5	3.3	..	..	..	..
12	..	..	13.0	2.9	..	..	..	..
22	..	..	11.0	2.5	..	..	..	..
27	21	14	7.0	2.4	22	2.6	32 35	2.3 2.8
37	93	44	11.0	2.3	22	2.2	13	2.0
35	23	26	15.0 25.0	2.7 3.0	38	3.2	..	..
39	61	23	8.0	2.5	14	3.3	..	..
43	42	21	27.0	3.5	..	..	21	..
44	30	30	10.0	3.1	6	2.5	..	..
6	39	26	....	..	2	3.6	2	2.9
26	23	34	..	..	..	..	5	3.4
30	68	28	....	..	..	..	2	3.0
34	260	78	....	..	..	..	5	3.2
5	53	56	....	..	7	2.3	0	0.5
7	46	32	....	..	0	2.4	10	2.4
14	28	21	....	..	4	3.0	5	2.3
20	103	51	....	..	7	2.5	48	2.2
29	13	31	....	..	7	3.0	12	2.8
41	56	30	....	..	?	1.9	8	1.5
42	42	31	....	..	5	3.3	13	3.8
15	49	21	....	..	56	3.0	12	4.0
18	19	19	....	..	1	2.3	0	2.7
26	7	7	....	..	5	2.5	5	3.3
4	116	35	....	..	10	3.2	..	..
19	74	28	....	..	5	1.8	..	..
35	42	21	....	..	11	2.5	..	..
	0	44	....	..	17	2.6	..	..
	21	14	....	..	23	2.7	..	..
40	70	28	....	..	10	2.5	..	..
	0	20	....	..	7	3.0	..	..
	175	42	....	..	14	3.9	..	..
8	22	15	....	..	8	3.0	..	..
16	27	23	....	..	..	..	11 13	2.5 2.5
31	4	4	....	..	..	..	..	3.0
33	77	35	....	..	..	..	21	3.6

From the character of the side effects, their induction by injection and the occurrence of nervous and cutaneous reactions in addition to the gastrointestinal discomfort, it would appear justifiable to regard them as largely central in origin. Local irritation of the gastric and intestinal mucosae may be a contributory factor but is not essential to the production of the side effects.

3. The Effect of Stilbestrol on Hepatic Function.—The results in the control series showed that the benzoate excretion was within normal limits in only three of nine cases, and the bilirubin tolerance test was normal in one of nine cases. Following stilbestrol administration in two (cases 27, 37) of six cases in this

group, the bilirubin retention progressively increased without a significant change in the benzoate excretion. In cases 38 and 39 the bilirubin retention increased while the benzoate excretion improved. In case 44 the bilirubin retention decreased and the benzoate excretion decreased.

Normal results for bilirubin retention and sodium benzoate excretion were obtained following stilbestrol administration in cases 26 and 30, and in case 34 even after 200 mg. was given over a seventy-eight day period. In case 6 there were both a normal bilirubin retention and sodium benzoate at the end of the course of 39 mg. in twenty-six days, and after the discontinuance of stilbestrol for fifty-one days.

In the group of ten cases (5, 7, 14, 20, 29, 41, 42, 15, 18 and 36) in which the first test was performed at the end of the stated course of stilbestrol, the bilirubin tolerance and sodium benzoate excretion test were both abnormal in three cases (5, 8 and 20); the bilirubin tolerance alone was abnormal in two cases (15 and 29); the sodium benzoate alone was abnormal in three cases (7, 18 and 41). No further stilbestrol was administered to these patients, and retests after a few weeks to months showed a variable trend, as exemplified by the fact that in three cases (14, 20 and 29) both tests showed decreased liver function and in two cases (5 and 42) the results in one test showed improvement, whereas the other showed a decrease in function and in three instances (15, 18 and 36) both tests showed improvement.

Those done during the administration of stilbestrol, as in cases 35 and 40, were equivocal. In the former the bilirubin retention increased as administration was continued and the sodium benzoate excretion tended to improve; in the latter the sodium benzoate excretion showed a rather marked improvement and the bilirubin retention did not change significantly.

The high incidence of abnormal results in the control group and the variable response in the stilbestrol-treated group prevent any conclusion at this time.

COMMENT AND SUMMARY

In this study an attempt has been made to evaluate the synthetic estrogen stilbestrol from the standpoint of its estrogenic activity, its influence on subjective symptoms of the menopause and its safety as a therapeutic agent for the human being.

Its estrogenic activity in the human being would appear to be definitely established not only on the basis of its ability to induce a follicular or estrous type of vaginal smear, vaginal cornification and withdrawal bleeding but also by evidence from other studies which have shown that endometrial hyperplasia, proliferation of the mammary epithelium and inhibition of lactation followed its use.

We have ventured to speculate on the significance of the oral immunity enjoyed by the synthetic estrogen. Two experimental observations seem pertinent to this phenomenon. The first of these is the very low recoveries of natural estrogens after injection into experimental animals. The second is the demonstration, by perfusion experiments, that the liver is capable of quickly removing large amounts of natural estrogens from the circulating blood. These observations point to the existence of some mechanism predominantly in the liver by which these hormones can be inactivated or degraded to a form with lower potency. Some such mechanism would explain the loss of activity of the

estrogens, such as estrone and estradiol, and the immaturity of estril which is believed to be a degradation form with a much lower potency than the former compounds. By mouth, these estrogens would reach the liver before getting into the peripheral circulation, offering a better opportunity for inactivation than when given by injection. The purpose of a mechanism for preventing the accumulation of the more potent estrogens in the body is as obscure as our knowledge of what the effects of such accumulations would be. If this mechanism has a homeostatic purpose, its inability to cope with the potent synthetic estrogens stilbestrol and ethinyl estradiol might not be devoid of danger. It is of interest, in this connection, that both these chemically unrelated substances should be extremely active by mouth and produce the same type of toxic side effects. May we be witnessing here that type of reaction which would result from the unchecked accumulation of highly active natural estrogens in the circulation? The reason for the existence of a mechanism for inactivation would then be apparent. It would be ironical if any gain in oral potency could be made only at the expense of the normal protective mechanisms of the body.

These studies are in accord with others cited as to the ability of stilbestrol to abolish the subjective symptoms of the menopause. Some reservations were expressed, though not very strongly, as to whether the relief induced by the synthetic estrogen was qualitatively as good as that experienced with the natural ones. It seemed more likely that the differences reported were due to the freedom from side effects with the latter preparations.

A variety of toxic effects were observed. A number of these, such as nausea, vomiting, abdominal distress, anorexia and diarrhea, were associated with the gastrointestinal tract and have been reported by other workers. They were frequently severe enough to alarm not only the patients but also the investigators. In addition to these, lassitude was a common complaint, occasionally profound enough to resemble the effect of a hypnotic. One effect, of the nature of a toxic psychotic reaction, was noted, as well as two instances of paresthesia. There was one episode of marked thirst, similar to a case reported elsewhere, and finally eight cutaneous rashes, a type of reaction not previously observed. The diversity of these effects argues for their central origin as against the suggestion that the toxic effects are due to local irritation of the gastrointestinal tract. Local irritation may play a contributory role, but all the symptoms can be induced by injection.

The high incidence of these toxic effects in our series is striking. Of forty-four cases treated, they were absent or trivial in only nine, or 20 per cent. How to reconcile the occurrence of symptoms in the remaining 80 per cent with the extremely low incidence reported by several groups of workers is not clear. In one series, that reported by Bishop, Boycott and Zuckermann,²² the low dosage and short periods of treatment frequently employed may partly account for the low incidence (7 per cent) of toxic effects. Of twenty-seven courses of treatment given by these workers to fifteen menopausal women, the daily oral dose in twelve was 0.1 mg., in seven more 1 mg. for from four to fourteen (in one case twenty-eight) days. During sixteen of these twenty-seven courses, the subjective improvement was nil. Of nine smears examined, three were consid-

ered estrous, three showed no change and three were improved, two only slightly. Of eighteen cases of amenorrhea, nine failed to have withdrawal bleeding. If the criteria of induction of follicular smears and symptomatic relief are considered a proper standard, an appreciable number of patients in this series would appear to have been undertreated. These comments are not meant as a criticism of the commendable caution exercised in the first studies of a new and potent drug but are an attempt to reconcile the discrepancies between the two studies.

The obverse question arises as to whether the patients in our series received overdoses of the drug. We felt that a fair test of the therapeutic safety of stilbestrol would consist in freedom from unpleasant reactions when amounts were taken sufficient to induce an estrous smear and complete symptomatic relief. Once these objectives were attained, the level of dosage was not raised (except inadvertently in one case, 34). The higher doses used in this study were a consequence of our adherence to these criteria and cannot be considered excessive in terms of the usual standards for the evaluation of therapeutic agents.

There appeared to be no justification for the view that the side effects could be avoided by the choice of the intramuscular route or that a tolerance to the drug could be expected to develop in most cases with its continued use.

One of the main points at issue is whether the side effects are to be regarded as unpleasant but otherwise innocuous concomitants of the action of the drug or whether they are expressions of underlying damage and hence contraindications to its use. According to the first interpretation, stilbestrol would represent a therapeutic agent suitable for restricted use by patients who are free from its side effects or willing to tolerate them and for whom expense is a major consideration, natural estrogens being available. The second view would regard the drug as unsuited for human use in its present form, interpreting the symptoms as threshold phenomena the absence of which would not necessarily preclude the presence of organic or functional damage.

Our studies of hepatic function, using bilirubin retention and hippuric acid formation as indexes, are inconclusive in that they fail to show uniform impairment in all cases in which stilbestrol was administered. Liver function tests, probably because of the large reserve of this organ, are not very sensitive to small amounts of damage. Much more work along these lines will be necessary to establish this point, and such studies are in progress.

A consideration of the evidence furnished by this as well as other studies cited forces us to the conclusion that stilbestrol in its present form is not suitable for use in the human being. Whatever doubts may exist as to the nature of the side effects produced, it would be safer to confine the drug to experimental use for the present and until the significance of the side effects is better understood. The several advantages of the drug lead us to hope that the chemist will eventually be able to modify its structure so as to retain its favorable and eliminate its unfavorable properties.

CONCLUSIONS

1. Stilbestrol is actively estrogenic in the human being, capable of inducing follicular smears, vaginal cornification and withdrawal bleeding in amenorrhea and the menopause.

²² Bishop, Boycott and Zuckermann.⁴ Winterton and MacGregor.⁵ Kellar and Sutherland.⁹

2. Less active than estradiol benzoate parenterally, stilbestrol is more efficient than the natural estrogens by mouth, losing but one half or less of its activity by this route. It is, however, less active than ethinyl estradiol by mouth. The oral estrogenic unit for the human being lies between 2 and 4 mg.

3. Stilbestrol is capable of relieving the subjective symptoms of the menopause.

4. In a series of forty-four cases treated, its use was associated in thirty-five (80 per cent) with toxic symptoms in the form of nausea, vomiting, abdominal distress, anorexia, diarrhea, lassitude, paresthesias, vertigo, thirst, an acute psychotic reaction and cutaneous rashes.

5. The toxic effects are largely central in origin, following injection as well as oral administration.

6. There is no relation between the size of the dose and the development of toxic reactions.

7. There is no evidence of an acquired tolerance to the drug.

8. Until the nature of the side effects of stilbestrol are understood, its use in the human being should be confined to experimental studies by qualified investigators.

EFFECTS OF THE THERAPEUTIC USE OF DIETHYLSTILBESTROL

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AND

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Diethylstilbestrol is a synthetic estrogen, the chemical and estrogenic properties of which were reported by Dodds, Lawson and Noble.¹ Extensive animal experimentation since has shown it to have more pronounced estrogenic effects when given by mouth than the naturally occurring estrogens, even when the latter are injected intramuscularly.

Guldberg² first reported the clinical use of stilbestrol in the case of a young castrate in whom he produced what he considered actual menstruation by stilbestrol and progesterone injection. Since then stilbestrol has been extensively used clinically in England and elsewhere with excellent therapeutic results in cases in which estrogen therapy is indicated.

Winterton and MacGregor³ and Kellar and Sutherland⁴ reported the frequent occurrence of nausea and vomiting following the administration of stilbestrol and that has been one of the main objections to its use. The possibility that the substance may have further toxic effects on the liver, kidney or hematopoietic system has led to the investigation of seventeen cases in which varying doses of stilbestrol were administered.

In these cases the following diagnostic procedures were carried out: complete blood counts, including

platelets, urinalysis, serum protein partition, icteric index and the van den Bergh reaction.

Eleven of these patients were being treated for menopause symptoms, four for senile vaginitis, one for ovarian insufficiency and one for secondary amenorrhea. The cases were unselected except as follows: All menopause patients were first given a therapeutic trial on small doses of phenobarbital. Only those who did not respond to phenobarbital treatments received stilbestrol. No persons were treated who had a family history of mammary carcinoma.

The carcinogenic aspects of naturally occurring estrogens when injected into mice of a carcinoma strain is well known. Geschickter⁵ has reported mammary carcinoma in normal rats not only with naturally occurring estrogens but also with stilbestrol.

The dosage of stilbestrol varied greatly, some patients receiving as little as 1 mg. a day for one week and others as much as 30 mg. a day for from fourteen to twenty-one days. One patient received 1,320 mg. over a period of four months. Improvement of symptoms had no relationship to the amount of medication given, 1 mg. a day having been found sufficient in some cases whereas as much as 30 mg. a day for twenty-days was of no help in others.

Improvement of symptoms in menopause patients was judged entirely on a reduction or cessation of hot flushes. Patients kept a daily written record of the number of flushes in twenty-four hours. Two had no change, four had a reduction of more than half of the previous number and five reported entire disappearance of the hot flushes.

Patients with kraurosis vulvae, leukoplakia and senile vaginitis have been grouped under the latter heading for the sake of convenience. They received stilbestrol in the form of wool fat ointment. All have reported relief of symptoms, and the appearance of the local lesions has improved.

The patient with ovarian insufficiency complained of profuse irregular menstruation accompanied by headache and severe depression following a unilateral salpingo-oophorectomy. Following stilbestrol treatment her menstruation became normal and the other symptoms were relieved.

The patient with secondary amenorrhea is a 34 year old woman who had not menstruated for two years. Basal metabolism and other laboratory tests were normal. Stilbestrol was given for twenty-five days, and five days following this treatment the patient had a six day period of bleeding. This procedure has been repeated for three months with the same result. At the beginning of treatment the uterus was about 5 cm. in length and the uterine cavity so small that at the time of biopsy it would admit only the smallest type of curet. No endometrium was recovered. During the stilbestrol treatment the uterus has grown to normal size and the endometrium at biopsy shows normal proliferative endometrium, with an unusual amount of mitotic activity.

Nausea and occasional vomiting occurred in four of the seventeen cases. This proportion is smaller than that reported in other series, possibly because with a few exceptions the medication was placed in gelatin capsules. The occurrence of nausea and vomiting had no relationship to the amount of drug used. The vomiting was severe enough in one case to necessitate cessation of treatment. Otherwise it was transitory.

5. Geschickter, C. F.: The Relationship of Estrogens to Mammary Cancer, read at the Third International Cancer Congress, Atlantic City, N. J., Sept. 11, 1939.

Aided by grants from the Rockefeller Foundation and from the National Committee on Maternal Health.

From the Sloane Hospital for Women, the Department of Anatomy and the Department of Obstetrics and Gynecology, College of Physicians and Surgeons.

1. Dodds, E. C.; Lawson, W., and Noble, R. L.: Biological Effects of Synthetic Oestrogenic Substance 4:4'-dihydroxy-alpha:beta-diethylstilbene, *Lancet* **1**:1389 (June 18) 1938.

2. Guldberg, E.: Echte Menstruation bei einer kastrierten Frau nach Zufuhr von synthetisch hergestellten Hormonstoffen, *Zentralbl. f. Gynäk.* **62**:2384 (Nov. 19) 1938.

3. Winterton, W. R., and MacGregor, T. N.: Clinical Observations with Stilbestrol (Diethylstilbestrol), *Brit. M. J.* **1**:10 (Jan. 7) 1939.

4. Kellar, R. J., and Sutherland, J. K.: Clinical Experiences with New Synthetic Estrogen—"Stilbestrol" (Diethylstilbestrol): Report to Therapeutic Trials Committee of Medical Research Council, *J. Obst. & Gynec.* **Brit. Emp.** **46**:1 (Feb.) 1939.

Dizziness was mentioned in two cases but this symptom is difficult to evaluate because of its frequent occurrence without medication during the menopause.

One patient (16) with severe nausea and vomiting developed albuminuria and casts during the course of treatment. Her urine had been negative when examined several months before stilbestrol treatment, and although her other tests, including blood chemistry, were negative, it is possible that this evidence of toxicity may be attributed to stilbestrol.

the possible toxic hepatic effects of medications, the results are not considered in the conclusion of this series. None of the three patients mentioned showed toxic reactions clinically, and other generally accepted laboratory tests for liver damage were negative.

CONCLUSION

Although this series is not sufficiently large to permit a therapeutic evaluation of stilbestrol, the investigation of the possible toxic reactions of the substance has been

Results of Treatment

Case No.	Age	Diagnosis	Treatment	New Symptoms Following Treatment	Time of Laboratory Test	Result	Result of Treatment
1	45	Menopause	1 mg. daily 2 weeks	None	Immediately after treatment	Negative	Excellent
2	32	Surgical menopause	10 mg. daily 2 weeks	Weak; occasionally dizzy	Immediately after treatment	Negative	Excellent
3	32	Ovarian insufficiency	20 mg. daily 2 weeks	None	One month after treatment	Negative	Excellent
4	65	Senile vaginitis	10 mg. salve daily	None	.....	.....	Excellent
5	58	Senile vaginitis	2 mg. salve daily	None	One and two months after treatment	Negative	Excellent
6	40	Menopause	30 mg. daily 27 days	None	Six days after treatment	PSP 50%, albumin +, occasional casts	Poor
7	44	Menopause	30 mg. daily 2 weeks 10 mg. daily 1 week 1 month later 3 mg. daily 2 weeks 1 month later	Occasionally dizzy	Immediately after second treatment Immediately after third treatment	Negative	Excellent
8	43	Senile vaginitis	3 mg. ointment daily 2 weeks	None	Immediately after treatment	Negative	Excellent
9	41	Menopause	5 mg. daily 2 weeks then 1 (S) mg. daily	Nausea, vomiting once after treatment	Immediately after treatment	Negative	Fair
10	31	Menopause	10 mg. daily 2 weeks 10 mg. daily 1 week 1 week later 20 mg. daily 1 week later	Sore nipples	Immediately after first treatment Immediately after second treatment Immediately after third treatment Four months after last treatment	Negative Negative Negative	Poor
11	50	Menopause	3 mg. daily 1 week 2 mg. daily 5 weeks	Nausea	Immediately after first treatment Immediately after second treatment Ten days after second treatment	Negative Negative Negative	Excellent
12	31	Secondary amenorrhea	30 mg. daily 25 days 10 mg. daily 37 days	None	Immediately after first treatment Immediately after second treatment Three months after second treatment	Negative Negative	Excellent
13	60	Senile vaginitis	10 mg. daily 1 week, salve 3 mg. daily 3 weeks	None	Immediately after first treatment Immediately after second treatment	Negative	Good
14	43	Menopause	10 mg. daily 1 week	Nausea	Immediately after first treatment	Negative	Fair
15	45	Radium menopause	5 mg. (S) 1 day 1 mg. daily 20 days	None	Immediately after first treatment	Negative	Excellent
16	53	Radium menopause	5 mg. (S) 1 day 1 mg. daily 22 days	Nausea; vomiting	Immediately after first treatment	Albumin in urine 5%, occasional coarse and granular casts	Fair
17	45	Radium menopause	1 mg. (S) daily 25 days	None	Immediately after first treatment	Negative	Fair

All treatments except those marked with S were given in gelatin capsules.

* This patient complained of hypertensive cardiovascular disease and syphilis. The primary manifestations were present before treatment began; consequently these were not attributed to stilbestrol.

The Hanger cephalin flocculation test⁶ has also been carried out in a routine way on all patients. This is a new method being developed for determination of the degree of irritation of liver parenchyma. It is used as a differential diagnostic factor in the diagnosis of hepatitis. Three patients in this series have shown slight reactions to this test, indicating possible irritation of the hepatic parenchyma. As the significance of positive reactions to this test has not as yet been subjected to extensive clinical trial, especially with regard to

sufficiently prolonged and intensive to justify conclusions concerning its toxic effects. The shortest period of clinical observation following treatment has been one month; most patients have been followed for from two to three months and several for six months. Laboratory investigation included complete blood counts, including platelets, urinalysis, serum protein partition, icteric index and van den Bergh reaction. As far as can be ascertained from these laboratory studies, no evidence of toxicity can be attributed to this estrogen in sixteen of seventeen cases treated. Toxicity possibly attributed to this substance was observed in one patient with positive urinary manifestations. There has been no evidence of allergic or urticarial phenomena.

6. Hanger, F. M.: Serological Differentiation of Obstruction from Hepatogenous Jaundice by Flocculation of Cephalin-Cholesterol Emulsions, *J. Clin. Investigation* **18**: 261 (May) 1939; Flocculation of Cephalin-Cholesterol Emulsions by Pathological Sera, *Tr. A. Am. Physicians* **33**: 148, 1938.

The therapeutic results coincide with those reported in larger series. It is evident that this oral estrogen is at least as effective, in ameliorating the symptoms attributed to estrogen deficiency as other therapy by injection and is much more convenient for the patient. The nausea and vomiting is not thought to be a contraindication to the use of stilbestrol. These symptoms may be partially avoided by the use of gelatin capsules.

It should be borne in mind by the clinician that stilbestrol and the naturally occurring estrogens—estrone, estradiol and others—are not innocuous substances but act on various organs and functions of the body not intimately related to the gonads. The actions of estrogens in any or all species of animals, in causing squamous cell metaplasia of both genital and extra-genital tissues, of a direct effect on the anterior pituitary gland and other less definite but alleged effects have not been as yet clearly demonstrated in the human being. However, the observed effects in women and the abundance of data on progressive effects in animals should raise a reasonable doubt in the mind of the clinician that these substances may be given with impunity.

In particular, as stated, patients with a family history of carcinoma should not be given extensive courses of estrogenic therapy.

It appears evident that, with so potent a chemical easily available and widely used, one of the tasks confronting the clinician is to clarify the indications for estrogenic treatment and to watch for latent posttherapeutic results.

STUDIES ON STILBESTROL

PRELIMINARY STATEMENT

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AND

ELLEN LOEFFEL, M.D.

ST. LOUIS

At the request of Dr. Barr, we are making this preliminary report to the Council.

Beginning in March 1939 we undertook studies of the new synthetic estrogen, diethylstilbestrol. We have studied thirty-seven patients in all, twelve of whom had had both ovaries removed, five part but not all of the ovarian tissue removed, five patients with marked hypogonadism and amenorrhea, and fifteen patients with severe symptoms of spontaneous menopause.

We have found diethylstilbestrol to be very actively estrogenic when given orally, as well as when administered by injection. The symptoms of hypogonadism have been relieved and there have been marked estrous changes in the vaginal smears and endometrial biopsies. Considerable breast growth has been produced and withdrawal bleeding can be produced almost at will. The doses necessary to produce these effects ranged from 0.1 mg. to 5 mg. by mouth or by injection daily.

We have not found the very high incidence of toxic effects reported by some observers. Nausea occurred in eight cases, or approximately 21 per cent of our series. Vomiting occurred in three cases after large doses but ceased when the dose was reduced. To two patients the preparation has been administered in daily doses of 5 mg. by injection for six months without any subjective or objective evidences of toxicity. The aver-

age dose employed has been 1 mg. by mouth or by injection daily. No cutaneous reactions were observed. There were no changes noted on urine examination. Complete blood studies conducted in all cases in which large amounts were administered over long periods have failed to reveal any change in the red blood cells, white blood cells, platelets or hemoglobin content. Repeated tests of liver function performed on the nine patients who received the largest doses and were treated for the longest periods failed to reveal evidence of diminished hepatic function. The liver function tests employed were estimation of the icterus index, bromsulphalein excretion, hippuric acid synthesis, galactose tolerance tests, and blood prothrombin estimations.

Animal studies that we have conducted at the same time have shown that with very large doses thrombocytopenia and purpuric manifestations can be produced. Animals receiving from two to ten times the therapeutic dose as computed by body weight have as yet failed to show any toxic manifestations.

In none of the patients treated has it been necessary to withdraw the preparation because of toxic manifestations. Nausea was produced more easily by oral treatment but occurred also after injections. Changing from parenteral to oral therapy or reducing the size of the dose has always caused disappearance of the nausea in our cases.

Our data are now almost completely assembled, and a full report will be published in the near future.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LERCIE, Secretary.

GASTRIC MUCIN.—The fraction precipitated by approximately 60 per cent alcohol from the supernatant liquid after pepsin-hydrochloric acid digestion of hog stomach linings.

Actions and Uses.—Gastric mucin is prepared for use in the treatment of peptic ulcers.

Dosage.—Average dose 2.5 Gm., which can be given at two hour intervals.

Gastric mucin occurs as a white to yellow powder or brownish yellow granules. It possesses a slightly salty taste and characteristic odor indicative of peptones. Both forms yield a viscous, gray, opalescent solution when triturated with water.

Dry approximately 1 Gm. of gastric mucin, accurately weighed, to constant weight at 100 C.: the loss in weight does not exceed 6 per cent.

Incinerate approximately 1 Gm. of gastric mucin, accurately weighed, in a muffle furnace at 500 C.: the ash content does not exceed 6.5 per cent.

Transfer a 10 Gm. sample of gastric mucin to a 125 cc. Erlenmeyer flask and add 100 cc. of 70 per cent ethanol (737 cc. of U. S. P. ethanol diluted to 1 liter). Stopper the flask, shake the mixture for thirty minutes and decant the supernatant liquid. Repeat this addition of alcohol and extraction for a total of six times. Measure the combined extracts and filter a portion through a dry filter paper. Evaporate 50 cc. of the filtrate to dryness, dry at 100 C. and 72 cm. of mercury to constant weight, and calculate the dry weight, *S*, in the total volume of alcohol. The mucin content, calculated as $(10-S) \times 10$, is not less than 73 per cent nor more than 90 per cent.

Determine the nitrogen content in the dried alcohol insoluble residue (described in the foregoing paragraph) by the Kjeldahl method according to Methods of Analysis of the Association of Official Agricultural Chemists, ed. 4, page 23: the nitrogen content is not less than 7.0 nor more than 9.0 per cent.

Transfer 0.1 Gm. of the dried alcohol insoluble residue as previously obtained to a 125 cc. Erlenmeyer flask and add 50 cc. of two-normal sulfuric acid. Digest on a steam bath under a reflux condenser for three hours and dilute to 100 cc. Transfer 4 cc. of this solution to 30 per mm. test tube, add 1 drop of phenolphthalein and neutralize with 30 per cent sodium hydroxide. Add 5 cc. of standard copper reagent (Twenty-five Gm. of anhydrous sodium carbonate, 20 Gm. of sodium bicarbonate and 25 Gm. of sodium potassium tartrate is dissolved in 600 cc. of distilled water; 7.5 Gm. of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is dissolved in 100 cc. of water and introduced with constant stirring into the carbonate-tartrate solution through a funnel resting on the bottom of the container. To the solution add 5 Gm. of potassium iodide and 22 cc. of an alkaline standard normal solution of potassium biiodate (32.498 Gm. of potassium biiodate

and 83.3 cc. of normal sodium hydroxide made up to 1 liter). The resultant solution is made up to exactly 1,000 cc. and make up to 10 cc. Cover the test tube with a small beaker and suspend it in boiling water. Add 5 cc. of normal sulfuric acid and after one minute titrate with 0.005 normal sodium thiosulfate, using starch as an indicator. The sodium thiosulfate is standardized against the 0.022 normal copper sulfate-iodate reagent, 5 cc. of which should require 22.0 cc. of the thiosulfate. The difference between this control figure and the number of cubic centimeters of thiosulfate used in the determination should not be less than 8.6 nor more than 12.2 cc.; that is, not less than 25 per cent nor more than 35 per cent of reducing material, calculated as dextrose in the alcohol insoluble material.

Prepare a 2 per cent solution of gastric mucin by triturating 2 Gm. of mucin with 100 cc. of water and passing it through a 60 mesh screen. Determine the *pH* of this solution by means of a glass electrode at 25 C.; the *pH* is not below 3.7 nor above 6.5. Determine the viscosity of this solution at 25 C. within one hour by means of a 10 cc. Mohr pipet and compare it with water: the relative viscosity is not below 1.30 nor above 3.50.

Gastric Mucin-Armour.—A brand of gastric mucin-N. N. R. Manufactured by the Armour Laboratories, Chicago, by license from the Gastric Mucin Committee of Northwestern University Medical School under U. S. patent 1,829,270 (Oct. 27, 1931; expires 1949). No U. S. trademark.

Gastric Mucin Powder-Armour.
Gastric Mucin Granules-Armour.

Gastric Mucin-Stearns.—A brand of gastric mucin-N. N. R. Manufactured by Frederick Stearns & Co., Detroit, Mich., by license from the Gastric Mucin Committee of Northwestern University Medical School under U. S. patent 1,829,270 (Oct. 27, 1931; expires 1949). No U. S. trademark.

Gastric Mucin Powder-Stearns.
Gastric Mucin Granules-Stearns.

Gastric Mucin-Wilson.—A brand of gastric mucin-N. N. R. Manufactured by the Wilson Laboratories, Chicago, by license from the Gastric Mucin Committee of Northwestern University Medical School under U. S. patent 1,829,270 (Oct. 27, 1931; expires 1949). No U. S. trademark.

Gastric Mucin Powder-Wilson.
Gastric Mucin Granules-Wilson.

ASCORBIC ACID (Cevitamic Acid) (See New and Nonofficial Remedies, 1939, p. 499). The following dosage form has been accepted:

I. P. C. Ascorbic Acid Tablets: Each tablet contains not less than 0.025 Gm. of ascorbic acid, equivalent to 500 international units of vitamin C per tablet.

Prepared by the International Vitamin Corporation, New York.

THIAMIN CHLORIDE (See New and Nonofficial Remedies, 1939, p. 498). The following dosage forms have been accepted:

I. P. C. Thiamin Chloride Crystalline Tablets, 0.5 mg.: Each tablet contains 0.5 mg. of thiamin chloride, equivalent to 166 international units of vitamin B₁.

Prepared by the International Vitamin Corporation, New York. No U. S. patent or trademark.

I. P. C. Thiamin Chloride Crystalline Tablets, 1.0 mg.: Each tablet contains 1.0 mg. of thiamin chloride, equivalent to 333 international units of vitamin B₁.

Prepared by the International Vitamin Corporation, New York. No U. S. patent or trademark.

I. P. C. Thiamin Chloride Crystalline Tablets, 3.3 mg.: Each tablet contains 3.3 mg. of thiamin chloride, equivalent to 1,100 international units of vitamin B₁.

Prepared by the International Vitamin Corporation, New York. No U. S. patent or trademark.

SODIUM CITRATE 2½% W/V IN PHYSIOLOGIC SOLUTION OF SODIUM CHLORIDE IN TRANSFUSO-VAC CONTAINER-BAXTER.—A 2.5 per cent solution of sodium citrate in physiologic solution of sodium chloride contained under reduced pressure in a specially adapted bottle.

Actions and Uses.—For indirect blood transfusion. The flow of blood from the needle in the donor's vein into sterile citrate solution in an evacuated container is controlled by a simple valve. The blood is administered to the recipient by gravity flow and is completely filtered during administration.

Manufactured by Baxter Laboratories, Inc., Glenview, Ill. (American Hospital Supply Corporation, Chicago, distributor). U. S. patent 1,941,071; additional U. S. patent pending. U. S. trademark 365,142.

Sodium Citrate 2½% W/V in Physiologic Solution of Sodium Chloride in Transfuso-Vac Container, 33 cc., Baxter: Contains 2.5 per cent sodium citrate in physiologic sodium chloride solution.

Sodium Citrate 2½% W/V in Physiologic Solution of Sodium Chloride in Transfuso-Vac Container, 70 cc., Baxter: Contains 2.5 per cent sodium citrate in physiologic sodium chloride solution.

Sodium Citrate 2½% W/V in Physiologic Solution of Sodium Chloride in Transfuso-Vac Container, 105 cc., Baxter: Contains 2.5 per cent sodium citrate in physiologic sodium chloride solution.

Sodium citrate 2½% W/V in physiologic solution of sodium chloride is a clear colorless, odorless solution possessing a salty taste. It is contained under a pressure of approximately 8 cm. of mercury, in a bottle which can be equipped with an accompanying valve to regulate the inflow of liquids. The solution responds to the qualitative tests for sodium, chlorides and citrates as given in the U. S. Pharmacopeia under Sodium Citrate and Sodium Chloride respectively.

Insert the closed valve in the bottle and attach the valve outlet to a manometer; slowly open the valve; the mercury rise indicates a maximum internal pressure of 120 mm. at 25 C.

The *pH* of the solution, as determined by means of a glass electrode, should not be above 7.5 nor below 6.7. Evaporate a 25 cc. sample in a tared platinum dish to dryness on the steam bath and dry to constant weight at 120 C.; the weight of the residue is not more than 0.880 Gm. nor less than 0.800 Gm. Carefully ignite this residue until the ash is white, care being taken not to heat the dish above a dull red. Cool and transfer the dish and contents to a 250 cc. beaker; add 17.5 cc. of half-normal sulfuric acid and 30 cc. of water, and digest the mixture on the steam bath for one hour. Filter the solution, wash the residue carefully, and titrate the filtrate with tenth-normal sodium hydroxide, using methyl orange as an indicator: the calculated sodium citrate content is not more than 2.60 Gm. nor less than 2.30 Gm. per hundred cubic centimeters.

NICOTINIC ACID (See New and Nonofficial Remedies, 1939, p. 495).

Nicotinic Acid-N. Y. Q.—A brand of nicotinic acid-N. N. R. Manufactured by the New York Quinine and Chemical Works, Inc., Brooklyn, N. Y. No U. S. patent or trademark.

FERROUS SULFATE, DESICCATED.—Exsiccated Ferrous Sulfate.—Dried Ferrous Sulfate.—Exsiccated Ferrous Sulfate contains the equivalent of not less than 80 per cent of anhydrous ferrous sulfate [FeSO₄].—U. S. P. X.

Actions and Uses.—The product is generally administered in the form of pills, for the purpose of increasing the hemoglobin of the blood. It was formerly official in the U. S. P. X but was omitted from the U. S. P. XI. Its advantages over the official hydrous preparation are its physical properties (the hydrated material is difficult to capsule).

Dosage.—From 0.3 to 0.6 Gm. (5 to 10 grains) daily.

Manufactured by Lederle Laboratories, Inc., Pearl River, N. Y. No U. S. patent or trademark.

Dried Ferrous Sulfate Capsules 0.33 Gm. (5 grains): Each capsule contains approximately 0.33 Gm. (5 grains) of dried ferrous sulfate, which is equivalent to about 0.11 Gm. of metallic iron.

Desiccated ferrous sulfate occurs as an odorless, tasteless, grayish white powder. It dissolves slowly but almost completely in water and is insoluble in alcohol. When ignited, the salt rapidly darkens to a red-brown colored powder.

Place about 1 Gm. of desiccated ferrous sulfate in a stoppered graduated cylinder, add 20 cc. of recently boiled and cooled distilled water, filter the solution rapidly and divide the filtrate into four portions; to one portion add 1 cc. of potassium ferricyanide solution; a dark blue precipitate which is insoluble in hydrochloric acid but is decomposed by sodium hydroxide, results; to another portion add 1 cc. of sodium hydroxide; a greenish yellow precipitate forms which changes rapidly to green-brown and finally to brown on shaking in air; to another portion add 1 cc. of barium chloride solution; a white precipitate results insoluble in hydrochloric and nitric acids; to the last portion add five drops of lead acetate solution; a white precipitate soluble in excess ammonium acetate results.

Dry about 5 Gm. of desiccated ferrous sulfate, accurately weighed, to constant weight at 100 C.; the loss does not exceed 1 per cent. Dissolve the foregoing dried salt in about 90 cc. of water, add 10 cc. of nitric acid and boil to expel oxides of nitrogen. Pour while hot, with stirring, into a mixture of 80 cc. of water and 20 cc. of ammonium hydroxide; filter and wash the precipitate with water until the filtrate with stirring, ignites; a residue of not more than 0.1 per cent remains (alkalis and earths); neutralize another 100 cc. portion of the filtrate with glacial acetic acid and add 1 cc. in excess, followed by 2 cc. of fresh potassium ferrocyanide solution; neither a pink color nor a turbidity is produced in ten minutes (copper and zinc).

Transfer about 5 Gm. of desiccated ferrous sulfate, accurately weighed, to a 100 cc. stoppered calibrated flask, add 50 cc. of recently boiled and cooled distilled water, 2 cc. of sulfuric acid, and finally fill to the mark with water; stopper the flask tightly, allow the salt to dissolve and mix thoroughly: the resultant solution possesses a pale green color and is but slightly turbid; filter through a tared sintered-glass crucible and dry at 110 C.; the residue does not exceed 0.1 per cent. Transfer about 0.75 Gm. of desiccated ferrous sulfate, accurately weighed, to a 100 cc. Erlenmeyer flask, dissolve in 20 cc. of diluted sulfuric acid and titrate immediately with tenth-normal potassium permanganate: the content of anhydrous ferrous sulfate [FeSO₄] is not less than 80 per cent nor more than 89 per cent.

LIQUID PETROLATUM (See New and Nonofficial Remedies, 1939, p. 300).

Mead's Mineral Oil with Malt Syrup: An emulsion of white mineral oil with malt syrup. White mineral oil 50 cc., with acaia and gum tragacanth, is dispersed in malt syrup. The malt syrup is prepared by nailing a mixture containing approximately 80 per cent of barley and gum per cent of corn starch. The mixture is standardized, and 2 cc. of alcohol is added to make 100 cc. The percentage by weight composition of the emulsion is as follows: malt syrup (78 per cent solid) 54 per cent, mineral oil 38 per cent, water 5.5 per cent, alcohol 1.4 per cent, acaia 1 per cent and gum tragacanth 0.1 per cent.

Prepared by Mead Johnson & Company, Evansville, Ind. No U. S. patent or trademark.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 23, 1939

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PITUITARY GLAND AND WATER DIURESIS

The conception has been advanced that the kidney, under normal conditions and with respect to tubular activity in the reabsorption of water, is subject to stimulation by the antidiuretic hormone, the degree of stimulation being proportional to the amount of hormone present in the blood and, consequently, to the rate of pituitary secretion. Furthermore, the secretion of the pituitary may be governed in turn by nervous stimuli or by changes in the composition of the blood transmitted to the gland through mediation of the central nervous system. This theory of a control of urine volume by the pituitary is attractive and has been called on to explain variations in water excretion which occur under diverse circumstances, including water diuresis.

Reports conflict with regard to proof of the presence of antidiuretic hormone in body fluids in concentrations which vary with physiologic variations in urine volume.

As pointed out by Walker,¹ it seems essential to the acceptance of the theory that this proof be furnished. Because of the importance of investigations which throw light on this side of the problem, the observations of Gilman and Goodman² have attracted considerable attention and have already been discussed in *THE JOURNAL*.³ This study indicated the presence of antidiuretic substance in the urine of dehydrated rats but not in the urine of normal control animals and also not in the urine of dehydrated hypophysectomized rats. With regard to the excretion of antidiuretic principle by dehydrated rats, the observations of these workers have in general been corroborated by Bolyston and Ivy,⁴ and similar results have also been reported for cats by Ingram and his associates.⁵ The recent investigation of Walker¹ on the occurrence of antidiuretic substance in the urine, blood and cerebrospinal fluid of various animals deserves particular mention because the results obtained failed to disclose definitive support for the pituitary hormone theory of water diuresis. Although an antidiuretic potency which appeared to be peculiar to dehydrated animals could be demonstrated in rabbit blood and rat urine, prolonged experimentation indicated that the antidiuretic material in the latter was not identical with the antidiuretic fraction of pituitary secretion. Indeed it was found that alteration in the experimental conditions of the method used for detecting antidiuretic material permitted the demonstration of an antidiuretic effect in the urine of hydrated as well as dehydrated rats and also in the urine of several rats which had been completely hypophysectomized. Moreover, the presence of the pituitary gland was found to be unnecessary for the occurrence of antidiuretic substance in the urine of cats, since it was found in essentially unaltered amounts in hypophysectomized specimens in a number of cases. It is also noteworthy that the cerebrospinal fluid of pituitarectomized as well as normal dogs possessed an antidiuretic effect. Walker also studied the response of pituitarectomized animals to water administration and withdrawal; he found it to be similar to that of normal animals, indicating that in this case some mechanism other than the posterior lobe of the pituitary gland is capable of effecting alteration in the urine volume. In this connection it may be recalled that Newton and Smirk,⁶ in a study on the pituitary gland in relation to water diuresis, have reported that a natural control of this process may be present in decerebrate cats with total hypophysectomy.

Particularly in view of the results of the recent experimental study of Walker, it would appear that there is some doubt as to the origin of the antidiuretic substance which has been detected in the urine as well as

1. Walker, A. M.: *Am. J. Physiol.* **127**: 519 (Oct.) 1939.
2. Gilman, Alfred, and Goodman, Louis: *J. Physiol.* **90**: 113 (July) 1937.

3. Antidiuretic Hormone of the Posterior Pituitary, editorial, *J. A. M. A.* **109**: 1545 (Nov. 6) 1937.

4. Bolyston, G. A., and Ivy, A. C.: *Proc. Soc. Exper. Biol. & Med.* **38**: 644 (Jan.) 1938.

5. Ingram, W. R.; Ladd, L., and Benlow, J. T.: *Am. J. Physiol.* **127**: 544 (Oct.) 1939.

6. Newton, W. H., and Smirk, F. H.: *J. Physiol.* **81**: 172 (May) 1934.

in the blood and cerebrospinal fluid of a number of animals under certain experimental conditions. The role of the pituitary in the mechanism responsible for controlling water diuresis requires additional elucidation. Because of the theoretical and practical importance of the problem of excretion of water by the kidney, further developments which throw more light on this problem will be awaited with interest.

PHYSICIAN AND PHARMACOPEIA

THE JOURNAL on previous occasions has criticized the machinery for the production of the U. S. Pharmacopeia, pointing out that the decennial convention occasionally has been controlled unduly by the pharmaceutical interests.¹ That the criticism is cogent may be confirmed easily when one refers to the proceedings of the 1930 convention. Medicine has not received its just representation because fewer physicians than pharmaceutical representatives have been appointed for the decennial convention. While it is true that each incorporated state medical association and each incorporated medical college and each medical school connected with an incorporated college or university is entitled to send three delegates to the Pharmacopeial Convention, state medical societies and medical colleges hesitate to incur the expense of sending three delegates. For that reason the Board of Trustees of the American Medical Association, the Council on Pharmacy and Chemistry and THE JOURNAL have suggested² that the evils of one-sided representation could be corrected if only one vote was recorded for an organization. The next convention meets the second Tuesday in May 1940 at Washington. Its deliberations will inaugurate any new procedures that may be possible for the better conduct of future conventions. The committee which it appoints will be the one that will largely determine the policies of the U. S. Pharmacopeia XII.

The Pharmacopeia is significant particularly because of its relation to the present Food, Drug and Cosmetic Act. The Pharmacopeia has been the book which describes the standards for many drugs and some medical appliances, such as catgut and absorbent cotton. The law provides that the Food and Drug Administration of the U. S. Department of Agriculture may enforce these standards. In its cooperation the medical profession must meet the reasonable demands set forth previously,² particularly proper representation and the determination of the therapeutic scope of the Pharmacopeia. Every state medical society should send to the convention the three delegates to which it is entitled. The selection of these delegates, such as pharmacologists or practitioners, should be along the lines laid down by THE JOURNAL ten years ago.³ A delegate need not

necessarily be a resident of the state in which the society or school is located, but he should know the policies of the group he represents. Because of an outworn provision only persons who attend the decennial convention are eligible for membership on the Revision Committee. This stipulation should be kept in mind in the selection of proper representatives.

In the 1930 convention only three state medical societies had full representation, and half of the state medical societies did not have any representatives. Medical schools did better; twelve sent three delegates each, but forty schools were represented by only seventy-one representatives instead of the 120 to which they were entitled. Other medical schools failed to send delegates. If this situation is repeated in 1940, the Pharmacopeial method of procedure may again fail to be revised to meet the difficult issues which have developed.

ESTROGEN THERAPY—A WARNING

The last ten years has seen a remarkable development in our knowledge of the endocrines. Especially great strides have been made in the therapeutic application of sex hormones, notably the estrogenic substances. Pure highly potent preparations of estrogens are being manufactured. Furthermore, biochemists are constantly striving to discover new compounds of even greater activity or to increase the efficiency of those already known. Pharmaceutical chemists are looking for better preparations which may be protected by patent. Much attention has been given to the preparation of estrogens for oral use, since the advantages of such therapy over hypodermic administration are appreciable.

Two new compounds—ethinyl estradiol and diethylstilbestrol—have been used clinically in recent months and have been shown to be as effective as the injected estrogens in moderate doses. General acceptance of these compounds has been prevented by complaints of disagreeable symptoms following their ingestion. Ethinyl estradiol induced in a considerable percentage of patients nausea, vomiting, headache and malaise. Diethylstilbestrol, however, has been prescribed, especially in England. The reports as to the toxic reactions of this substance are quite conflicting, some investigators stating that gastric distress is the only complaint, that this is experienced by from 5 to 10 per cent of the patients, and that it vanishes after a few days of administration. Others have found side reactions in greater numbers. One group of American investigators has observed as high as 80 per cent of the patients exhibiting untoward reactions, including cutaneous eruptions, psychosis, lassitude and liver damage. Apparently a thorough investigation of this compound is in order before it can be prescribed for routine therapy. In this issue of THE JOURNAL (p. 2312) will be found a statement of the Council on Pharmacy and Chemistry on the present status of stilbestrol; also three articles published under its auspices.

1. The Pharmacopeial Convention, editorial, J. A. M. A. 94:1707 (May 24) 1930.

2. The Call for the Pharmacopeial Convention of 1940, editorial, J. A. M. A. 112:1969 (May 13) 1939.

3. The Call for the Appointment of Delegates to the United States Pharmacopeial Convention, J. A. M. A. 93:939 (Sept. 28) 1929.

The conflicts in the reports on these substances and the opinions of some authorities on the possible harm from estrogen therapy should warn against long continued and indiscriminate therapeutic use of estrogens. Like numerous other therapeutic agents estrogens are effective under the proper circumstances, but there may be definite danger when they are used unscientifically. In this connection the possibility of carcinoma induced by estrogens cannot be ignored. The long continued administration of these proliferating agents to patients with a predisposition to cancer may be hazardous. The idea that estrogens are related in their activity only to sex organs should be abandoned. Other tissues of the body may react in an undesirable manner when the doses are excessive and over too long a period. This point should be firmly established, since it appears likely that in the future the medical profession may be impertuned to prescribe to patients large doses of high potency estrogens, such as stilbestrol, because of the ease of administration of these preparations.

Current Comment

TREATMENT OF PNEUMONIA

So much has been published concerning the newer methods of treating pneumonia that it is often difficult to determine what is a practical procedure. Recently, however, the Maryland State Department of Health, through its Pneumonia Control Committee, has released its recommendations to the profession. The first recommendation is that every effort be made to obtain sputum for typing at each visit, unless the type of infecting pneumococcus has already been determined. Suitable containers for collecting specimens are provided by the board and specimens should be sent to county or state laboratories as soon as obtained. Sulfapyridine therapy should be begun as soon as the diagnosis of pneumonia is made. The initial dose for an adult (any patient over 14) should be 60 grains (4 Gm.) followed by 15 grains (1 Gm.) every four hours until the temperature has been normal for forty-eight hours; thereafter 15 grains is given four times a day until resolution is well under way or the patient's temperature has been normal for four days. Finally, $7\frac{1}{2}$ grains (0.5 Gm.) is given four times a day until the patient is ready to leave bed. Directions are also given for adding salt if vomiting is present, for including sodium bicarbonate and for giving at least 4 quarts (liters) of fluid each day during which sulfapyridine is administered. Children weighing under 40 pounds (18 Kg.) are given 1 grain (0.065 Gm.) of sulfapyridine per pound of body weight as an initial dose. After this one fourth of the initial dose is given four times daily for the next four days, at the end of which time the dose is halved and continued until the temperature is normal for at least five days. The drug should be withheld from patients who have developed drug fever or rash, anemia, jaundice or leukopenia during a previous course of sulfanilamide or sulfapyridine therapy. Warning is issued to discontinue the drug immediately should such well known symptoms as anemia, leuko-

penia, hematuria, jaundice, drug fever or drug rash appear. Sulfapyridine is placed in the hands of each county health officer for free distribution when certified as necessary by the physician. The department of health through its regional laboratories and through specially trained public health nurses also provides an alternate day laboratory service of blood counts which, the committee believes, supplemented by careful clinical observations, offers a reasonable safeguard against serious toxic effects. This service is supplied free, when requested, by a public health nurse. The recommendations made by this committee not only constitute excellent medical practice but also are completely practicable and are readily adaptable to many states.

TUBERCULOSIS IN YOUNG CHILDREN

Knowledge of the pathogenesis of pulmonary tuberculosis in small children has been previously extended by some of the studies at the Lymanhurst Health Center of Minneapolis during recent years. Now Tortone and his colleagues¹ report a follow-up study of 4,328 children who received tuberculin tests on entering the clinic. Of these, 79.1 per cent had negative and 16.4 per cent had positive tuberculin reactions when first tested; in the remaining 4.5 per cent the results of the initial tuberculin test were inconclusive. The x-ray study of more than 1,700 children not sensitive to tuberculin failed to reveal lesions suggestive of tuberculosis. Of the 701 children who were sensitive to tuberculin when first tested, the initial x-ray examination disclosed no lesion in 268, calcification in 286 and pneumonic infiltrations in 155. The incidence of pneumonic infiltration interpreted as primary pulmonary tuberculosis in the acute inflammatory stage of development decreased gradually with advancing age. Of the 629 children with positive tuberculin reactions on entrance who were traced for an average period of about five years, ten had died of tuberculosis, five under 1 year of age and five between 1 year and 2. Eight of these children who died had remained in intimate contact with persons in their respective homes who were known to have open tuberculosis. The pneumonic primary infiltration found on the x-ray examinations of 146 tuberculin sensitive children who controlled and survived this form of the disease resolved spontaneously in each instance. This resolution left the lungs roentgenographically normal in 100 children and produced Ghon tubercles in forty-six. Of the 3,424 children who failed to react to tuberculin on the first test, 157 later became sensitive to tuberculin. X-ray studies made after these primary infections revealed normal lungs in ninety-one, pneumonic infiltration in seventeen and intrathoracic deposits of calcium in forty-nine. None of these children died of tuberculosis in the period during which they were followed. It may be concluded from these studies that primary tuberculosis in young children in Minneapolis tends to be a relatively benign disease and that they control and survive infection with tubercle bacilli much more often than was formerly considered possible.

1. Tortone, José; Chattrás, Alberto; Myers, J. A.; Stewart, C. A. and Streukens, Theodore: Tuberculosis in Children Less Than Six Years of Age. *Am. J. Dis. Child.* 58:92 (July) 1939.

ORGANIZATION SECTION

THE SMALL COMMUNITY HOSPITAL AS A TEACHING HOSPITAL

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Why cannot a fifty-bed community hospital render a service on the firing line, as it were, of medical practice such as is rendered by a teaching hospital? The consensus is that a teaching hospital is a hospital organized for the purpose of undergraduate teaching and intern training and attached to, or administered by, a medical school. Such a hospital is thoroughly organized into medical and administrative departments, each with its own chief who directs its efforts, supervises its work and inspires its teaching activities. The staff at such a hospital naturally gives attention to the detail of clinical records in order to develop a basis for medical literature, establishes a minimum standard of diagnostic procedure as a guide for those ministering to patients, makes detailed laboratory and x-ray studies of each patient to support the clinical observations and study the effects of disease, arranges for clinical pathologic conferences or staff conferences to pool experience, and organizes seminars and journal clubs which all staff members must attend. All this is considered necessary in a teaching hospital as general opinion visualizes such an institution, in order to teach undergraduates and interns the best medical practice, the most scientific approach to the study of illness and the methods of seeking and obtaining medical information.

This conception of a teaching hospital does not fit the small rural hospital. It lays emphasis on a pyramid type of staff organization and places responsibility on the department heads for the continued study of the art and science of medicine. A resident physician in a fifty bed rural hospital recently remarked that there is so much clinical material available at the hospital that he would need at least thirty-six hours in every day in which to study it, to do the patient justice and to make it most valuable to him. His use of the two concepts clinical material and study are fundamental and a real lead in developing the teaching ideal as it applies to the small hospital. Teaching is based on the study of illness. What is there in environment causing it and how can it be most successfully diagnosed and treated? Therefore in attacking these problems a teaching hospital should be found wherever there is a patient in a hospital and wherever there are inquiring minds on the staff of physicians attending the patients. Following this ideal, staff members approaching the study and care of illness with the spirit of critical analysis of each patient should be able to make teaching material from even the so-called routine medical work they are called on to handle in their day to day hospital practice.

Since the care of the patient is medical practice and the acquisition of experience important, one of the most important steps in teaching is the pooling of the individual experience of each physician with that of others in a common fund of knowledge. In the community hospital where there are no department heads and the staff organization is horizontal, this can be done best in the hospital staff meeting, provided of

course the staff members approach their meeting with the spirit of critically analyzing and freely discussing their experience. Staff leadership in terms of individuals may be officially vested in elected chairmen and appointed committees, but staff leadership providing the stimulus for a high quality of medical work is unofficially vested in the consensus of the staff as a group. A concerted will to share experience, submerge individual personalities and establish a real give and take of critical judgment is the only sound basis for a teaching hospital. Every physician of the staff is both instructor and pupil.

Patients entering such a hospital know that under the standard of the hospital a real study of their illnesses will be made before treatment is undertaken. They know that their illnesses will receive the benefit of collective opinion of the entire staff. The staff in setting up such a standard makes each individual member responsible to the staff as a group for the maintenance of good quality of medical work. In setting this standard the staff is establishing a teaching hospital.

A staff that pools its experience in staff meeting and that sets up a minimum standard of diagnostic and therapeutic practice will quite naturally give attention to the development of another activity which, for want of a better word, is called "consultation." This might well be the informal interchange of thought and experience between staff members in their day to day hospital experience. In some hospitals the minimum standards may specify that all instances of serious illness likely to result in death or the interruption of a known, suspected or possible pregnancy shall have the benefit of written consultation with another staff member. The majority of consultations, however, are quite informal, two or more physicians of the staff viewing the patient and studying the illness as a complete entity with the added knowledge of the patient's home life in the community to assist them in reaching a conclusion. For future reference the second physician adds a note in the progress notes to indicate his observations, his line of thought and his conclusions, but the real interchange of information takes place in the corridor or the staff library. In other words, patients admitted to the hospital have the benefit of the experience of more than one of the physicians of the community. In one community hospital 25 per cent of all patients admitted last year had the benefit of written consultation as determined from the clinical records. Such a report of written consultations indicates the possibility that at least another 25 per cent of patients had the benefit of consultations which were not recorded. The hospital is a teaching hospital.

There is a considerable amount of drudgery to the preparation of a clinical record, with the result that much is omitted which is later found to be important, either in staff meeting or possibly even in the court room. The history and physical examination are important in the clinical record, but what is most important is the clinician's summary indicating his thinking in reaching his conclusion as to the disease process pres-

ent. Too frequently this is omitted in favor of a simple statement of the tentative diagnosis, making one wonder whether he might be afraid to indicate his method of arriving at the conclusion. Next most important is an accurate detailed description of the therapy used—medical, surgical, dietary or other—and the day to day record in the progress notes of the convalescence.

The hospital administration has the responsibility of building the staff library of current experience into something of value by making provision to index and file all records so that they are readily available for patients as a health record or for physicians as a study of illness. This requires the use of a nomenclature by both the hospital and the staff in order to index by disease classification. It also requires that the staff set forth the events in their hospital practice they may later want to study so that these can be indexed. Hospitals giving such attention to recording and indexing the experience of the staff are building a reference library of their own clinical material. Medical staffs using their clinical records as a basis for study are pooling their recorded experience. They are certainly teaching hospitals.

Frequently the discussion of medical records suggests to the staff a need for securing outside experience to add to their own. In such instances the staff will go to its medical library to obtain the benefit of the experience of others. A teaching hospital will therefore give considerable attention to the development of the hospital library, basing it on standard textbooks and developing it with current periodicals. But more than just buying books and periodicals is necessary to get the fullest use of the library. In one hospital the staff requests the library committee to report at each meeting on the material received in the current periodicals. With the presentation of each clinical record some report will be made of the experience of others as recorded in the current periodicals. In other hospitals there is an active journal club where each month a different phase of medical work is discussed on the basis of current and past literature. At this hospital fifteen minutes of each staff meeting is given over to the discussion of a case record reported and discussed in one of their weekly periodicals. This case record is typed off so that each staff member has a copy. In the course of the meeting each one sums up the case history in his own words and draws his conclusion.

When all have entered their comments, the final diagnosis and the comments of the attending physician are presented as well as the results of necropsy if a death occurred. These hospitals are teaching hospitals. They are adding the proved experience of medical history to their own.

The hospitals under discussion will supply as complete a service in pathology as is possible under their circumstances. At a minimum such service should be available for the examination of all tissues removed at operation necropsy. A more complete service includes regular visits by the pathologist to the hospital, examination of all tissues removed, performance of necropsies and attendance at staff meetings. Staff members must plan to use such service as is available to its fullest extent. At one hospital only the minimum service can be provided. Here one of the local staff members is designated as laboratory supervisor with the responsibility for making the laboratory work more serviceable to the staff, for performing all necropsies and for interpreting all pathologic reports. This supervisor sends a full report of his gross examination of all tissues to the pathologist so that all factors may be considered in the pathologist's report of the microscopic examination. Another hospital has been able to arrange for the pathologist to attend staff meetings. There from ten to fifteen minutes of each staff meeting is given over to a clinical pathologic conference using the tissues removed during the month and any available necropsy material as the basis of discussion. The staffs of these hospitals have taken as their ideal the willingness of members to review their clinical judgment objectively with the assistance of the pathologist's report and to face their clinical results at the necropsy table. The hospitals are teaching hospitals.

Finally the teaching values of a hospital depend on the willingness of the staff members as a group to pool their individual experiences without reservation into a common fund of knowledge to set up standards as a guide for their day to day hospital practice, to record their experience in an indexed library of clinical records, to consult freely with one another regarding individual patients, to lose no opportunity to check accurately their diagnoses and treatments, to study their recorded experiences in a constant attempt to improve their methods.

DEPRECIATION IN HOSPITAL BUILDINGS

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At the request of Mercy Hospital, San Diego, a survey was recently made of 1,000 hospitals accredited by the American Medical Association to ascertain the economic life of such an institutional building. Questionnaires were sent to all hospitals which were non-profit and proprietary institutions in California with fifty beds or more and in other states with 100 beds or over. Only those hospitals which might be considered as operating on a competitive basis were included. Information was returned on 384 of these properties.

Results of this survey when tabulated showed that in the 20 years and under age group not only had a number of hospitals been demolished but 20 per cent of them had required new capital expenditures for modernization. In the 20 to 30 year age group 72 per cent were reported as either modernized or demolished. Consid-

ering all reporting hospitals it was indicated that, before reaching the age of 40 years, 60 per cent of them had been demolished or had undergone one or more extensive modernization programs.

This survey was limited, of course, and results are not conclusive; but they do appear to support the conclusion that the probability of any hospital enjoying, without the addition of large amounts of new capital, an economic life of much more than thirty-five years is extremely remote and that a depreciation factor of at least 3 per cent as advocated by some hospital authorities is none too great.

Complete tabulation of results of this survey are presented herewith.

Opportunities for the appraisal of hospital properties are comparatively rare and there is little to be found

in appraisal literature dealing with this subject, the extent of the discourse on hospitals being that they are service properties and as such are to be appraised on a cost less depreciation basis.

Hospitals in our opinion, however, have in numerous cases many of the attributes of investment properties. The plant and equipment, the personnel, the receipts and disbursements, and the problems of management in a hospital are often more intricate than in those of large and important commercial enterprises, and the necessity for most of them to earn a return commensurate with the capital investment which they represent is no less than it is in the case of hotels, apartments and similar enterprises, which have, as do hospitals, space and service for sale and the investment nature of which is recognized. To complicate the situation further, there is the matter of necessary free service or charity cases.

Economic obsolescence in appraisal practice is that phase of depreciation which has to do with loss of value due to adverse economic factors not inherent in the property but rather environing it. In hospitals there is a phase of economic obsolescence which occurs in few other types of property. A hospital is subject to peculiar economic hazards. It is a civic and social institution which, unless it cooperates freely in promoting community well being, is thought of as not performing the task for which it was intended and which public opinion insists that it shall perform. The result of this situation is that it is exceedingly difficult to operate a hospital on a strictly commercial basis and, to the extent that its efforts are devoted to charitable activity and free service, it becomes uneconomic and suffers loss of value accordingly, as it grows impossible for it to earn a legitimate return on the capital investment which it represents.

In all states, with the exception of California, New Mexico and Wyoming, this situation is recognized and an effort to compensate for it is made by the elimination of taxes wholly or in part. Where no such tax concession is made, there appears to be logic to the contention that, so far as charitable activity results in a loss of capital value, the inequality which thus arises should be adjusted by a proportionate reduction in valuation in tax purposes.

In any consideration of a hospital as an investment property, cognizance must be taken of the cost of the charitable or free contribution. If the institution were

free to delegate this portion of its function to the state where it really belongs, it could devote this portion of its plant to income producing activities. As an illustration, let us say that one third of the plant of the entire hospital is devoted to charitable works. We must then consider that the property has suffered from economic obsolescence the loss of one third of its value.

Necessarily in any financial statement made for the purpose of obtaining financing, whether through a bond issue or a direct loan from a financial institution, this loss of value must be considered. If some public recognition could be obtained of this social demand to the

Demolition and Modernization of Hospitals

	Years of Actual Age					Total All Ages
	1 to 20	21 to 30	31 to 40	41 to 50	51 and Over	
Age at which modernized						
1 to 20.....	23	54	24	10	4	117
21 to 30.....	..	6	25	11	7	49
31 to 40.....	..	..	7	10	6	23
41 to 50.....	..	..	..	3	2	5
51 and over.....	..	..	..	..	4	4
Total modernized.....	25	60	56	34	23	193
Number demolished.....	3	7	20	9	7	46
Modernization not indicated.....	98	25	2	5	10	140
Number in group.....	126	92	75	48	40	381
Percentage of total.....	32	25	20	13	10	100

These figures are the result of a questionnaire sent to 1,003 hospitals throughout the United States accredited by the American Medical Association and excluding all city, county, state and federal hospitals or those of fraternal or industrial organizations. Only those were considered for which the making of a profit might be an important consideration. Included were such hospitals in California of fifty or more beds and in other states of 100 or more. Information was returned on a total of 381 hospitals.

extent that state or municipal aid was given, the financing of hospitals could be made much more simple.

With the tendency toward a more general use of hospitals in minor ailments we can, in our opinion, expect an acceleration of obsolescence. Expenditures for modernization and upkeep will necessarily increase in order to arrest this tendency. Without a doubt many hospitals which have coasted along on their reputations will find it necessary to make major expenditures in order to maintain their incomes and compete with more modern institutions.

923 Seventh Avenue.

GRADUATE MEDICAL EDUCATION

PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

VERMONT

At the 1938 annual meeting of the Vermont State Medical Society the secretary, Dr. B. F. Cook, suggested more active cooperation between the Vermont Department of Public Health, the Medical College of the University of Vermont and the state medical society. In the secretary's report for 1939 it was stated that such cooperation had been secured and had resulted in benefit to the public and to the profession.

For the past five years the state medical society has held two day spring clinical meetings in Burlington with the active participation of the medical college. Lectures, demonstrations and clinics are given in the hospital and other buildings of the college. General and special aspects of medicine and surgery are considered, the sessions beginning at 9:30 each morning with small group demonstrations and continuing through the evening. Attendance has averaged about 225.

Each fall there is a two day regular meeting of the state society. During the past two years this has been held in Burlington. In addition to lectures the 1939 meeting included a symposium on obstetrics in which six Vermont and out of state physicians participated; the annual attendance has averaged 200. Of the 501 licensed physicians in the state, 392 are members of the Vermont State Medical Society.

The Commonwealth Fund of New York has provided physicians practicing in the rural sections of Vermont with fellowships which permit graduate study in medical centers outside the state. Fourteen men practicing in thirteen different areas spent from one to three months in continuation study during the past year. All but four of these physicians had availed themselves of this opportunity on previous occasions. The conditions of fellowship followed the same general pattern as in Maine and New Hampshire. The secretary of the state medical society accepts applications for the Commonwealth Fund.

In 1938 the state medical society aided in the establishment of a library in connection with the medical library of the university at Burlington. Ample quarters and supervision have been provided for periodicals and books donated or purchased by members of the society. An annual allotment of \$150 has been made to develop this library.

During the same year the state society cooperated with the state department of public health in launching a statewide program for the control of pneumonia. For this purpose the state society lent \$1,000 to the department of public health to aid in the maintenance of a fund for the purchase of serum. This loan has been repaid and the program has been generally considered successful.

Beginning in 1936 the Division of Maternal and Child Welfare of the Vermont Department of Public Health held itinerant lectures and demonstrations in six county medical societies. Three hour programs in each subject were available at monthly intervals for three times. Movies were utilized whenever possible.

During 1936-1937 three programs were given in each county society. In 1937-1938 the subjects were varied and, from the list of twenty-four topics submitted, many related to general medicine and surgery; county societies could make their own selections. Teams of two or more speakers were furnished for these discussions. The same plan was followed in 1938-1939. In addition there was a symposium on medicine and dentistry in which two physicians and two dentists participated. This full day program was given in four sections of the state. Other symposiums, on ovarian pathology, on infections of the upper respiratory tract and on obstetric and general anesthesia, have been given with both Vermont and out of state physicians participating.

During 1938-1939 a total of ten obstetric lectures and twelve pediatric lectures were held in ten places with an attendance of approximately 200 physicians. This was an increase over 1937-1938. The obstetric lectures were given in eight communities and pediatric in seven, with a total attendance of 128.

OFFICIAL NOTES

THE NEW YORK SESSION

Meeting Places

Meeting places for the House of Delegates, the General Scientific Meetings, the Sections of the Scientific Assembly and the Scientific and Technical Exhibits at the annual session of the American Medical Association to be held in New York June 10 to 14, 1940, will be as follows:

HOUSE OF DELEGATES: The Waldorf-Astoria, Basildon and Jade rooms.

GENERAL SCIENTIFIC MEETINGS: The Waldorf-Astoria, Ballroom, and the Commodore, Grand Ballroom.

REGISTRATION AND SCIENTIFIC AND TECHNICAL EXHIBITS: Grand Central Palace.

SYMPOSIUM ON HEALTH EDUCATION: Hotel Roosevelt, Grand Ballroom.

SECTIONS OF THE SCIENTIFIC ASSEMBLY

PRACTICE OF MEDICINE: The Waldorf-Astoria, Ballroom.

SURGERY, GENERAL AND ABDOMINAL: The Commodore, Grand Ballroom.

OBSTETRICS AND GYNECOLOGY: The Commodore, Grand Ballroom.

OPHTHALMOLOGY: Hotel Roosevelt, Grand Ballroom.

LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY: Hotel Roosevelt, Grand Ballroom.

PEDIATRICS: The Waldorf-Astoria, Ballroom.

PHARMACOLOGY AND THERAPEUTICS: The Biltmore, Music Room.

PATHOLOGY AND PHYSIOLOGY: The Biltmore, Music Room.

NERVOUS AND MENTAL DISEASES: The Biltmore, Ballroom.

DERMATOLOGY AND SYPHILOLOGY: The Commodore, West Ballroom.

PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH: Hotel Roosevelt, Hendrik Hudson Room.

UROLOGY: The Commodore, West Ballroom.

ORTHOPEDIC SURGERY: The Biltmore, Ballroom.

GASTRO-ENTEROLOGY AND PROCTOLOGY: Hotel Roosevelt, Hendrik Hudson Room.

RADIOLOGY: The Commodore, East Ballroom.

MISCELLANEOUS TOPICS, SESSION ON ANESTHESIA: The Commodore, East Ballroom.

ADDITIONAL SPEAKERS AT ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Supplementing the preliminary program printed in THE JOURNAL December 9, the following speakers will participate in the Annual Congress on Medical Education and Licensure to be held in Chicago Feb. 12 and 13, 1940:

Presidential Address.

Roy B. Harrison, M.D., President, Federation of State Medical Boards of the United States, New Orleans.

Opportunities for a Medical Career in the Federal Civil Service.
A. Ray Dawson, M.D., Senior Medical Officer, Examining Division, United States Civil Service Commission, Washington, D. C.

(Subject to Be Announced.)

Ross T. McIntire, M.D., Rear Admiral, Medical Corps, and Surgeon General, United States Navy, Washington, D. C.

Inter-American Relations in Medical Education and Licensure.
Walter L. Biering, M.D., Secretary-Treasurer, Federation of State Medical Boards of the United States, Des Moines, Iowa.

Relationship Between Advertising and the Practice of Medicine.
K. E. Miller, M.D., Senior Surgeon, United States Public Health Service, Federal Trade Commission, Washington, D. C.

Advisory Council on Medical Education as Related to Licensure.
Willard C. Rappleye, M.D., Dean, Columbia University College of Physicians and Surgeons, New York.

The Philosophic Trend of Medical Practice Laws.

H. M. Platter, M.D., Secretary, Ohio State Medical Board, Columbus.

The Advantages of a Single State Board of Medical Examiners.

J. N. Baker, Secretary, Alabama State Board of Medical Examiners, Montgomery.

CORRECTION

Program for Instruction of Interns.—In the program for the Annual Congress on Medical Education and Hospitals (THE JOURNAL, December 9, p. 2157) one of the speakers on the subject "Program for Instruction of Interns" was printed as Nathan Davis, M.D., New York. This name should have been Nathan Smith, M.D., New York.

WOMAN'S AUXILIARY

New Jersey

The board of directors of the auxiliary to the Medical Society of New Jersey met in Camden October 29. Speakers were Mrs. Rollo K. Packard, president of the auxiliary to the American Medical Association, and Dr. LeRoy A. Wilkes, executive officer, *Journal of the Medical Society of New Jersey*.

The auxiliary to the Atlantic County Medical Society met in Atlantic City October 13. Speakers were Mrs. McDonnell, president, and Mrs. J. H. Hornberger, corresponding secretary

of the auxiliary to the Medical Society of New Jersey, and Mr. Frank G. Farley, assemblyman from Atlantic County in the New Jersey legislature. Mr. Farley spoke on constructive legislation.

South Dakota

The board of directors of the auxiliary to the South Dakota State Medical Association met in Huron October 3. The president, Mrs. A. E. Johnson, suggested that members study the works of prominent members of the medical profession. The special work of the auxiliary is its benevolent fund.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Annual Art Exhibit.—The Los Angeles Physicians' Art Society will hold its second annual exhibit in the lounge of the Los Angeles County Medical Association January 8-31. All members of the county medical association are invited to submit art work for this exhibit. There will be five classes of art for exhibition: modeling and sculpture (including wood-carving), painting, drawing, photography and handicraft. Additional information may be obtained from either Dr. Katherine Close, secretary, or Dr. Harold L. Thompson, president.

Annual Surgical Meeting.—The Los Angeles Surgical Society held its annual meeting December 13. The following program was presented:

Dr. James A. Jackson, Madison, Wis., Open Reduction Treatment of Fractures.
Dr. Albert H. Montgomery, Chicago, Abdominal Tumors in Childhood.
Dr. Earl C. Padgett, Kansas City, Mo., Superficial and Deep Intermediate Skin Grafts as Cut with the Dermotome.
Dr. Kellogg Speed, Chicago, Pitfalls in Bone Tumor Diagnosis and Prognosis.
Dr. Rollin Russell Best, Omaha, The Biliary Flush as an Aid in the Management of Biliary Tract Disease.
Dr. Willis D. Gatch, Indianapolis, Surgical Treatment of Acute Lesions of the Upper Abdomen.
Dr. Raymond W. McNealy, Chicago, Perforation in Peptic Ulcer: A Critical Review of 700 Cases.
Dr. Charles W. Mayo, Rochester, Minn., Combined Abdominoperineal Resection for Malignancy of the Lower Bowel.

COLORADO

New Officers of Hospital Association.—Mr. Frank J. Walter, Denver, was chosen president-elect of the Colorado Hospital Association at its annual meeting November 15 and Mr. R. J. Brown, Denver, was installed as president. Dr. Bertram B. Jaffa, Denver, is executive secretary. It was decided to hold the 1940 meeting in Denver November 13. Among the speakers was Dr. Bert W. Caldwell, Chicago, executive secretary, American Hospital Association, who discussed "Nongovernment Hospitals and the Federal Health Program."

Society News.—At a meeting of the Arapahoe County Medical Society November 27 Drs. Osgoode S. Philpott and Isadore Gersch of Denver discussed syphilis and gonorrhea respectively. The Fremont County Medical Society was addressed in Florence November 27 by Drs. Kon Wyatt, Canon City, on "Functional Disorders of the Colon" and Elwood B. Lynch, Canon City, "Practical Points on Diagnosis and Treatment of Diseases of the Liver."—Dr. Roland M. Klemme, St. Louis, addressed the Colorado Neurological Society in Denver December 16 on "Surgical Treatment of Paralysis Agitans, Athetosis and Dystonia."

CONNECTICUT

Hartford Times Radio Blood Donors League.—The Hartford Times Radio Blood Donors League has recently been established through the cooperation of the newspaper and its radio division WTHT. The league aims to secure a group of volunteers who are willing to give their blood for a transfusion without any monetary compensation. It is designed for use only in the four public hospitals in Hartford and is an emergency service intended solely for patients who are positively unable to secure a necessary transfusion in any other way. It is not available to persons able to pay or who have friends or relatives who can supply the transfusions. No call requesting a donor of a transfusion will be accepted except from a hospital or attending physician. Twenty-four hour service is provided. The four hospitals and the Hartford County Medical Association are cooperating in typing the volunteers. Of the 150 volunteers recorded November 21 sixty had been typed and donors for fifteen transfusions had already been supplied. Members of the committee in charge of the league are Ward Duffy, managing editor of the Hartford Times; Bob Martineau, program director of WTHT; Police Chief Butler of the Hartford police department, and Drs. Louis P. Hastings, Perry T. Hough, Abraham M. Schaefer and Ralph E. Kendall, chief pathologists at the St. Francis, Municipal, Mount

Sinai and Hartford hospitals, respectively, and Dr. Harry L. F. Locke, chairman of the medical information bureau of the Hartford Medical Society and the Hartford County Medical Association.

ILLINOIS

Society News.—Dr. Edward L. Compere, Chicago, was reelected president of the Illinois Association for the Crippled at its recent meeting in Chicago.—The Champaign County Medical Society was addressed November 9 by Dr. Roland M. Klemme, St. Louis, on "Surgical Treatment of Parkinson's Disease."—Dr. Joseph L. Baer, Chicago, addressed the Lake County Medical Society December 5 on "Prevention of Maternal Mortality."—Dr. Otto H. Schwarz, St. Louis, discussed "Use of X-Ray in Obstetrics" before the Sangamon County Medical Society, Springfield, December 7.

State Health Conference.—The annual state conference on public health was held in Springfield December 7-8. Among the speakers were:

Clair Turner, Dr. P.H., Cambridge, Mass., Educating the Public for Health.
Dr. Esmond R. Long, Philadelphia, The Tuberculin Test.
Dr. Theodore R. Meyer, Clayton, Mo., A Practical Program in Sanitation.
Dr. Harry S. Gradle, Chicago, Sight Conservation.
Dr. Franklin G. Ebaugh, Denver, Mental Hygiene in Public Health.
Dr. Warren F. Draper, Washington, D. C., The Federal Health Program.
Dr. Fred Moore, Des Moines, Iowa, School Health Programs.
Dr. Everett D. Plass, Iowa City, A Rural and Small Town Maternity Hygiene Program.
Reuben L. Kahn, Se.D., Ann Arbor, Mich., Serology in Syphilis.

A symposium on laws requiring diagnostic tests featured the luncheon for health officers with the following speakers: Dr. Kahn, Howard J. Shaughnessy, Ph.D., chief of the division of laboratories, state department of health, and Dr. Edward A. Piszczek, of the Chicago department of health.

Chicago

Dr. Pusey to Lecture on History of Chicago Medicine.—Dr. William Allen Pusey will deliver a public lecture in the auditorium of the Museum of Science and Industry, west pavilion, Jackson Park, January 9, on "High Lights in the History of Chicago Medicine." The lecture is sponsored by the Institute of Medicine of Chicago in conjunction with the Chicago Historical Society and the Society of Medical History of Chicago.

Branch Meetings.—At a meeting of the Evanston Branch of the Chicago Medical Society November 3 Dr. James Murray Kinsman, Louisville, Ky., discussed "Present Status of Sulfapyridine." Dr. James C. White, Boston, addressed the North Side Branch November 2 on "Neurological Treatment of Visceral Pain." At a meeting of the Englewood Branch November 7 Dr. Arthur Steindler, Iowa City, discussed "Fracture Malunion of the Ankle Joint." Dr. Anton J. Carlson discussed "Black Oxen and Toggenburg Goats" before a meeting of the Aux Plaines Branch December 15. A symposium on pneumonia was presented before the Calumet Branch December 15 by Drs. Paul S. Rhoads, Evanston, Ill., and Ford K. Hick. Drs. Harry M. Hedge and Samuel J. Zakon, among others, addressed the Douglas Park Branch December 19 on "Diagnosis and Treatment of Naevi" and "The Management of Some Common Skin Diseases."

IOWA

University News.—Dr. Hale F. Shirley, assistant professor of psychiatry, State University of Iowa College of Medicine, Iowa City, has resigned to become assistant professor of psychiatry and pediatrics at Stanford University School of Medicine and director of the Child Guidance Clinic, San Francisco. Dr. Shirley graduated at Iowa in 1927.

Society News.—Dr. William Wayne Babcock, Philadelphia, discussed peritonitis before the Black Hawk County Medical Society in Waterloo October 23.—At a meeting of the Boone and Story county medical societies in Ames October 24 Dr. Horton C. Hinshaw, Rochester, Minn., spoke on "Pneumonia and Upper Respiratory Infections."—The Crawford County Medical Society was host to the dentists of the county and the wives of both groups at a dinner meeting recently; Dr. Harry N. Boyne, Omaha, spoke on "The Care of Facial Injuries."—Dr. Lester R. Dragstedt, Chicago, discussed "Etiology and Surgical Treatment of Gastroduodenal Ulcers" before the Dallas and Guthrie county medical societies at a meeting in Guthrie Center, October 25.—The quarterly conference of the Lee County Medical Society was addressed in Keokuk October 20 by the following, all of

Chicago: Drs. John I. Brewer, on "Uterine Bleeding"; Grant H. Laing, "Clinical Importance of Pylorospasm"; George W. Hall, "Newer Treatment of Mental and Nervous Diseases," and Fremont A. Chandler, "Low Back Pain."—At the sixty-fourth annual meeting of the Southeastern Iowa District Medical Society in Washington October 26 the speakers included Dr. George D. Jenkins, Burlington, on "The Newer Concepts in the Treatment of Gonorrhea."

MASSACHUSETTS

Dr. Castle Awarded Walter Reed Medal.—Dr. William B. Castle, professor of medicine, Harvard Medical School, Boston, was awarded the Walter Reed Medal November 21 at a meeting of the American Society of Tropical Medicine in Memphis, Tenn. The award was made for his "meritorious achievements in the field of tropical medicine, his outstanding leadership and scientific investigations which have resulted in most important additions to our knowledge of sprue and related anemias," newspapers reported. Dr. Richard P. Strong, Boston, presented the medal. It was the first award in four years. It is given only in years when there has been particularly outstanding work. Dr. Castle, a graduate of Harvard, has been a member of its teaching staff since 1923 and professor since 1937.

Committee to Develop Research in Pharmacotherapy.—A committee on pharmacotherapy has been established at Harvard University to develop research and improve graduate training in the field of pharmacology and experimental therapeutics, coordinating the efforts of practicing physicians and Harvard scientists in biology, chemistry and medicine. Funds to support the work of the committee for the next five years have been donated by a group of corporations interested in medical and therapeutic research. Dr. Soma Weiss, Hersey professor of the theory and practice of physic at Harvard, is chairman of the committee. Other members are Dr. Fuller Albright, assistant professor of medicine; Dr. Henry K. Beecher, associate in anesthesia; Dr. Sidney Burwell, dean of the medical school, ex officio; Dr. Walter B. Cannon, George Higginson professor of physiology; Dr. William B. Castle, professor of medicine; James B. Conant, LL.D., president of the university, ex officio; Louis F. Fieser, Ph.D., professor of chemistry; A. Baird Hastings, Ph.D., Hamilton Kuhn professor of biological chemistry; Frederick L. Hisaw, Ph.D., professor of zoology; Dr. Otto Kraye, associate professor of comparative pharmacology, and Reginald P. Linstead, professor of chemistry. It is hoped that through the work of the committee pharmacology and experimental therapeutics will be more effectively cultivated and that an opportunity will be afforded for a new and improved graduate training in the field of pharmacology and experimental therapeutics.

MICHIGAN

Personal.—Dr. James W. Hubly, recently first assistant in the department of surgery at the Mayo Clinic, Rochester, Minn., has been appointed head of the department of surgery at the Battle Creek Sanitarium, Battle Creek. Dr. Martin A. Mortensen, who for several years was a member of the staff in internal medicine, has returned to the sanitarium, it was announced recently by the newly appointed administrator, Dr. John E. Gorrell.

State Society Night.—The Wayne County Medical Society, Detroit, designated its meeting December 4 as "state society night." Included among the speakers following a dinner in their honor were:

Dr. Burton R. Corbus, Grand Rapids, president of the state society, The Function of the State Medical Society.
Dr. Henry A. Luce, Detroit, delegate to the American Medical Association, National Medical Activities.
Drs. Henry R. Carstens and Andrew S. Brunk, both of Detroit, chairman and vice chairman of the council, respectively, and Dr. L. Fernald Foster, Bay City, secretary, Michigan Medical Service.
William J. Burns, executive secretary, Medical Welfare.

Society News.—Dr. Carl E. Badgley, Ann Arbor, discussed "Bone Surgery" before the Muskegon County Medical Society in Muskegon November 17.—Dr. Traian Leucutia, Detroit, discussed "X-Ray Therapy of Cancer" before the Oakland County Medical Society November 1 in Birmingham.—At the second meeting of the Michigan Society of Neurology and Psychiatry November 30 in Dearborn the speakers were Drs. Hawley S. Sanford, Detroit, on "Epileptic Phenomena Associated with Tumors of the Temporal Lobe," and Russell T. Costello, Detroit, "Migraine and Trigeminal Neuralgia Occurring in a Neuropathic Family."

MISSOURI

Dr. Baumgarten Named Editor of State Journal.—Dr. Walter Baumgarten, St. Louis, has been elected editor of *The Journal of the Missouri State Medical Association* to succeed Dr. Edward J. Goodwin, who retired last year and was elected secretary-editor emeritus. Dr. Baumgarten graduated at Washington University School of Medicine, St. Louis, in 1896.

Dr. Doisy Receives Annual Award.—Edward A. Doisy, Ph.D., professor and director of the department of biological chemistry, St. Louis University School of Medicine, St. Louis, recently received the seventh annual St. Louis Award at a public ceremony in the mayor's office, according to *Science*. The award, \$1,000 and a certificate, is the gift of an anonymous donor. Graduating at the University of Illinois in 1914, Dr. Doisy took his doctor's degree in 1920 at Harvard University. He served on the staffs of the medical schools of Harvard and Washington University before joining St. Louis University in 1923.

NEW YORK

District Meeting.—Two symposiums made up the program of the annual meeting of the Second District Branch of the Medical Society of the State of New York in Garden City November 16. Dr. Henry M. Moses, Brooklyn, presided at a morning session on neoplasms of the chest with the following speakers: Drs. Matthew G. Golden, Brooklyn; Irving S. Startz, Elmhurst; Carl H. Greene, New York; Raphael A. Bendove, New York; Alfred Angrist, Jamaica, and William H. Field, Brooklyn. Tuberculosis was the afternoon topic, with Dr. Charles E. Hamilton, Brooklyn, as chairman and the following speakers: Drs. Foster Murray, Abraham H. Levy, Edwin J. Grace, Peter Amazon, Brooklyn, James C. Walsh, Farmingdale, and Carl A. Hettesheimer, Hempstead.

New York City

Doctors' Orchestra Opens Concert Season.—The Doctors' Orchestral Society of New York gave its first concert of the season December 8 at the New York Philanthropic League Hall. The program included the Bach Brandenburg Concerto in G major No. 3; a Mozart quintet in A major; the andante cantabile from Tchaikowsky's String Quartet No. 11; compositions for violin and piano by Eda Rapoport, wife of a physician, and a group of solos by Miss Marcella Uhl. Ignatz Waghalter is conductor of the orchestra.

Memorial Meeting for Dr. Park.—Civic, educational and medical leaders held a memorial meeting November 28 in honor of the late Dr. William H. Park. Speakers included Mayor La Guardia; Harry Woodburn Chase, chancellor of New York University; Dr. Malcolm Goodridge, president of the New York Academy of Medicine; Dr. Anna W. Williams, former assistant director of the city health department's bacteriology laboratory under Dr. Park, and Dr. Augustus B. Wadsworth, director of laboratories and research, state department of health, Albany.

Dr. Bassler Honored.—The November-December issue of the *Review of Gastroenterology* was dedicated to Dr. Anthony Bassler in honor of his sixty-fifth birthday. Dr. Bassler, a native of New York, graduated in the last class from Bellevue Hospital Medical College before its merger with the New York University Medical College in 1898. He was successively lecturer in pediatrics, pathology and internal medicine at the new school from 1900 to 1910; clinical professor of physical diagnosis at New York Polyclinic Medical School and Hospital, 1911-1914, and professor of gastroenterology 1915 to 1925; professor of gastroenterology at Fordham University Medical College, 1915-1920. For the past four years Dr. Bassler has been president of the National Gastroenterological Association. He is consulting gastro-enterologist to several hospitals in New York and surrounding towns. He is the author of four books in his specialty and has contributed much to periodic literature.

Society News.—Speakers at a meeting of the New York chapter of the National Gastroenterological Association November 20 were Drs. William A. Steel, Philadelphia, on "Cholecystogastrotomy and Duodenostomy"; William A. Swalm and Lester Morrison, Philadelphia, "A New Liver Function Test."—Drs. Isidor C. Rubin and Bruce P. Webster addressed the New York Endocrinological Society November 22 on "Endocrine Therapy in Sterility: A Critical Review" and "Disturbances of Normal Mechanism of Puberty and Their Management" respectively.—Dr. Roderick V. Grace addressed the New York Surgical Society November 22 on "Surgery of

the Thyroid."—Drs. Henry Graham and Charles D. Sawyer addressed the New York Surgical Society November 8 on "Peritoneoscopy."—Drs. Max Pinner and Edgar Mayer addressed the Bronx County Medical Society November 15 on "Epidemiology and Pathogenesis of Pulmonary Tuberculosis" and "Diagnosis and Treatment of Pulmonary Tuberculosis" respectively.—Dr. Philip Sacks addressed the Bronx Otolaryngological Society November 28 on "Pneumococcal Meningitis, a Review of the Literature and Report of a Type XVIII Recovery of Otic Origin."—The Tuberculosis Sanatorium Conference of Metropolitan New York, which also includes Long Island, New Jersey and part of Connecticut, has formed a nursing and social service section.

NORTH CAROLINA

New Industrial Hygiene Director.—Dr. Thomas F. Vestal, Worcester, Mass., has been appointed medical director of the division of industrial hygiene in the state board of health. He succeeds Dr. Herman F. Easom, who recently resigned. Dr. Vestal is a native of North Carolina and a graduate of the University of Maryland School of Medicine.

District Meetings.—The Eighth District Medical Society held its annual meeting in High Point November 2, with Dr. William Halsey Barker, Baltimore, as the guest speaker on "Sulfanilamide, Sulfapyridine and Allied Compounds." A symposium on treatment of diabetes was presented by Drs. Opie Norris Smith, Greensboro; William H. Sprunt Jr., Winston-Salem; Roy C. Mitchell, Mount Airy, and Thomas D. Tyson Jr., High Point.—Speakers at a meeting of the Second District Medical Society in Washington October 31 were Drs. William M. Nicholson, Durham, on "Treatment of Diabetes with Modified and Unmodified Insulin"; August R. Peters Jr., Washington, "Sulfapyridine in the Treatment of Pneumonia," and Mr. H. S. Ward, attorney, "The Doctor in Court."—Dr. Eugene P. Pendergrass, Philadelphia, addressed the semi-annual meeting of the Tenth District Medical Society in Marion November 10 on cancer of the breast.

OHIO

Hospital Celebrates Golden Jubilee.—The Christ Hospital, Cincinnati, marked its golden jubilee with a dinner December 1 at which the principal feature was the presentation to the hospital of portraits of Drs. John C. Oliver and Edwin W. Mitchell. Dr. Oliver is the only living member of the original staff of the hospital and Dr. Mitchell has been a member since 1914.

Dr. Freiberg Honored.—The president of the University of Cincinnati and the faculty of the College of Medicine sponsored a dinner December 6 at the Netherland Plaza Hotel in honor of Dr. Albert H. Freiberg, recently retired professor of orthopedic surgery. Dr. Martin H. Fischer was toastmaster and the speakers were Raymond Walters, LL.D., president of the university; Drs. Stanley E. Dorst, Mont R. Reid and David I. Wolfstein, and the Rev. Jesse Halsey, pastor of the Seventh Presbyterian Church. A portrait of Dr. Freiberg was presented to him.

Society News.—Dr. Winchell M. Craig, Rochester, Minn., addressed the Warren County Medical Society, Franklin, November 22 on "Surgical Treatment of Hypertension."—Dr. Arthur Carlton Ernstene, Cleveland, addressed the Ashtabula County Medical Society, Conneaut, recently on "Common Errors in Cardiac Diagnosis."—Dr. Deane H. Northrup, Marietta, addressed the Washington County Medical Association, Marietta, on "Burns and Their Treatment"; Drs. George F. Swan, Cambridge, "Medical Organization in Relation to Public Needs," and William L. Denny, Cambridge, new state laws on relief.—Dr. Martin H. Fischer, Cincinnati, addressed the Butler County Medical Society, Hamilton, November 29 on arteriosclerosis.—Dr. Emil Novak, Baltimore, addressed the Academy of Medicine of Cincinnati December 19 on "The Endocrine Influence of Certain Ovarian Tumors." Dr. Maxwell Finland, Boston, spoke December 5 on "Serotherapy and Chemotherapy of Pneumonia."

OREGON

Personal.—Dr. Edward J. Dehne, formerly of Astoria, has been appointed health officer of Coos County to succeed Dr. Leslie S. Porter, Eugene, who resigned to join the University of Oregon health service.

Society News.—Drs. Robin M. Overstreet and Willis B. Shepard, Eugene, addressed the Lane County Medical Society, Eugene, October 23, on "Abdominal Symptoms in Childhood"

and "Motor Anomalies of the Eye" respectively.—Dr. Roger Anderson, Seattle, addressed the Polk-Yamhill-Marion Counties Medical Society, Salem, recently on "Fractures of the Clavicle and Injuries in the Region of the Shoulder Joint" and "Leg Fractures." Dr. Donald R. Laird, Portland, addressed the society November 7 on "Proctologic Problems of General Interest."

PENNSYLVANIA

Society News.—Drs. William J. Logue, Creed C. Glass, Meyersdale, and Alexander Solosko, Salisbury, presented a symposium on "Subacute Bacterial Endocarditis" before the Bedford County Medical Society, Bedford, November 28.—Dr. Harry D. Lees, Philadelphia, addressed the Delaware County Medical Society, Chester, December 14 on "Pennsylvania's Tuberculosis Problem."—Dr. Abraham Cantarow, Philadelphia, addressed the Harrisburg Academy of Medicine December 19 on "Effective Use of the Clinical Laboratory."—Dr. Joseph B. DeLee, Chicago, addressed the Lycoming County Medical Society, Williamsport, December 8 on eclampsia.

Philadelphia

Dr. Morgan Honored.—Alumni of the former Medico-Chirurgical College of Philadelphia made of their annual reunion dinner in November a celebration of the seventieth birthday of Dr. Arthur C. Morgan, long active in the affairs of the alumni association. Dr. Morgan received a testimonial volume signed by every living alumnus of the school, from which he graduated in 1897. The year following his graduation he became a member of the faculty and served until the school was taken over in 1916 by the University of Pennsylvania to be developed as a graduate school. In the new school he was associate professor of medicine from 1916 to 1922 and for several years was associate in medicine in the undergraduate department of the university. In 1922 he went to Temple University School of Medicine as professor of applied therapeutics, remaining in that chair till 1928. He has been emeritus professor of clinical medicine since 1930. Dr. Morgan has been active in medical organizations, as president of the Philadelphia County Medical Society, as president of the Medical Society of the State of Pennsylvania, and as member of the House of Delegates of the American Medical Association. His hospital affiliations have included the Frankford Hospital, of which he was physician in chief and medical director for eight years, and the Medico-Chirurgical, Polyclinic, Samaritan and Garretson hospitals, where he has been at various times visiting physician. He was also a member of the Pennsylvania State Board of Medical Examiners for several years.

VIRGINIA

Regional Meeting.—The Southside Virginia Medical Association held its quarterly session in Petersburg December 12 with the following speakers, all of Richmond, on the program:

- Drs. James W. Whitfield Jr. and Herman W. Farber, Care of the Skin in a Newborn Child.
- Dr. Harry Hudnall Ware Jr., Management of Placenta Praevia.
- Dr. Douglas G. Chapman, The Heart Beat Mechanism in Health and Disease.
- Dr. Oscar L. Hite, Complications Resulting from the Use of Sulfapyridine.
- Dr. Thomas F. Wheeldon, Use of the Smith-Petersen Nail in Fractures of the Neck of the Femur.

This society is made up of fifteen counties and the cities of Norfolk, Suffolk, Petersburg and Hopewell.

WEST VIRGINIA

Cancer Institute in Martinsburg.—The Eastern Panhandle Medical Society sponsored a cancer institute for the Eastern West Virginia division of the Women's Field Army of the American Society for the Control of Cancer December 13 in Martinsburg. Drs. Leopold Clarence Cohn, Baltimore, conducted a clinic and Dr. William Neill Jr., Baltimore, made an address on "Facts of Interest to Women Concerning Cancer." The visiting physicians also addressed the society at its regular luncheon meeting.

Society News.—Dr. Frank H. Lahey, Boston, addressed the Ohio County Medical Society, Wheeling, December 1, on "Various Thyroid States, Their Diagnosis and Management."—Dr. Mont R. Reid, Cincinnati, addressed the Kanawha Medical Society, Charleston, November 14 on "Healing of Wounds."—Dr. Hugh W. MacMillan, Cincinnati, also a dentist, addressed the Logan County Medical Society, Logan, November 8 on "Medical and Dental Conditions of the Head"

and Neck."—Drs. Albert H. Hoge and Marshall W. Sinclair, Bluefield, addressed the Mercer County Medical Society, Princeton, November 16 on "Fads and Fallacies of Endocrinotherapy" and "Breast Tumors" respectively.

WISCONSIN

State Society Moves.—The State Medical Society of Wisconsin has moved its offices to 917 Tenney Building, Madison. Future correspondence should be sent to that address.

Lippitt Memorial Lecture.—The fifth annual Lippitt Memorial Lecture at Marquette University School of Medicine will be delivered January 19 by Dr. Harry Goldblatt, professor of experimental pathology and associate director of the Institute of Pathology, Western Reserve University School of Medicine, Cleveland. Dr. Goldblatt's subject will be "Experimental Observations on the Pathogenesis and Treatment of Hypertension."

Society News.—The Central Wisconsin Society of Ophthalmology and Otolaryngology held its fall meeting in Wausau October 28-29. Dr. Henry L. Williams, Rochester, Minn., presented papers on "Results of Endonasal Window Operation for Maxillary Sinusitis" and "Surgery of Chronic Pansinusitis," and Dr. Charles W. Rucker, Rochester, on "Perimetry and the Visual Pathway" and "Treatment of Toxic Amblyopia." Dr. Archibald H. Beard, Minneapolis, addressed the Barron-Washburn-Sawyer-Burnett Counties Medical Society, Green Bay, November 7, on "Some Recent Theories on Diabetes, Including Therapy" and a motion picture on "Intracranial Injuries of the Newborn" by Dr. Pascal Brooke Bland, Philadelphia. Dr. Albert G. Schutte, Milwaukee, addressed the Brown-Kewaunee-Door Counties Medical Society, Green Bay, November 9, on "Diagnosis and Treatment of Common Rectal Conditions." Drs. John T. F. Gallagher and Luther E. Holmgren, Madison, addressed the Chippewa County Medical Society, Chippewa Falls, November 7 on "Open Reduction of Fractures" and "Spinal Anesthesia in Surgery" respectively. Dr. Walter C. Alvarez, Rochester, Minn., was the guest speaker before the Dane County Medical Society, Madison, November 14 on "What to Do for the Woman Who Is Always Complaining."

GENERAL

Special Society Election.—Dr. Spencer Braden, Cleveland, was elected president of the Academy of Neurosurgery at the annual meeting in New Orleans in October. Dr. Francis Murphey, Memphis, Tenn., was reelected secretary. The 1940 meeting will be in Cleveland.

Pediatric Awards.—The American Academy of Pediatrics at its annual meeting in Cincinnati November 17 presented the E. Mead Johnson awards of \$500 each to Drs. Frederic A. Gibbs, Boston, and Dorothy H. Andersen, New York. Dr. Gibbs was honored for his contribution to the knowledge of epilepsy and Dr. Andersen for her research on pancreatic disorders.

Southern Medical Election.—Dr. Quitman U. Newell, St. Louis, was chosen president-elect of the Southern Medical Association at the annual meeting in Memphis, Tenn., November 21-25 and Dr. Arthur T. McCormack, Louisville, Ky., was installed as president. Drs. Wilson L. Williamson, Memphis, and Ernst W. Bertner, Houston, Texas, were elected vice presidents. Next year's meeting will be in Louisville in November.

Northwest Regional Conference Changes Name.—The Northwest Regional Conference will henceforth be known as the National Conference on Medical Service. The conference is not official nor political, is not connected with any other organization or committee and its deliberations result in no resolutions or motions. It is informal, has no dues, by-laws or formal organizational structure. The fourteenth annual session will be held at the Palmer House, Chicago, Sunday Feb. 11, 1940. All state medical societies are invited to send representatives. Dr. L. Fernald Foster, Bay City, Mich., is president of the national conference and Dr. Forrest L. Loveland, Topeka, Kan., secretary.

New Films on Syphilis.—The American Social Hygiene Association has produced a documentary sound film, "With These Weapons," to aid in the campaign against syphilis. It has been prepared for distribution to schools, colleges, state and local health departments, women's clubs, social hygiene societies, churches and other organizations. The film opens with scenes illustrating the work of Schaudinn, Wassermann, Ehrlich and present day scientists and progresses to the principles of diagnosis and treatment, depicting the disease in its relation to individual and public health. Another film, entitled "Three Counties Against Syphilis," was produced by the U. S. Public Health Service to show the work of the trailer clinics for control of syphilis in three counties in Georgia.

Inter-American Society of Microbiology.—At the close of the recent International Congress of Microbiology in New York an Inter-American Society of Microbiology was organized with Dr. A. Sordelli, Buenos Aires, as the first president and Dr. Francesc Duran-Reynals, New Haven, Conn., as executive secretary. Two major problems which the society hopes to solve by this cooperation are (1) to devise a means for better exchange of results of studies in Latin and North America and (2) to effect a more intimate affiliation between the workers of all countries in study of diseases common to all. The new society plans to approach the solution of these problems by establishing an official journal and by organizing a congress. It is proposed that the journal will make its pages available to contributors from both Latin America and North America, the necessary translation being done in the United States. The proposed congress will be in Rio de Janeiro three years hence. Dr. J. C. N. Penido, Rio de Janeiro, was chosen to organize a committee to prepare for it.

Patients with Cancer Treated with Neutron Rays.—Cancer patients are now being treated with neutron rays produced by the cyclotron at the University of California, it was announced at the annual meeting of the National Advisory Cancer Council December 4. It is hoped that the rays from the 225 ton medical cyclotron at the university may break down cancer cells and effect, at least temporarily, some definite remission, according to a statement from the U. S. Public Health Service. The new 60 inch cyclotron occupies its own laboratory on the Berkeley campus of the university. In a report, Ernest O. Lawrence, Ph.D., who developed the cyclotron, for which he was awarded the Nobel Prize this year, stated:

The new installation has been steadily improved, and at the present time it is gratifying to report that it is performing even better than we had reason to expect. The outfit runs with complete steadiness and reliability when producing 100 micro-amperes of 16 million volt deuterons (or one micro-ampere of 32 million volt alpha particles), and under these conditions the output of neutron rays, gamma rays and radioactive substances is prodigious. The latter are being sent to many parts of the world for experimental purposes. Should it prove desirable, we will be able to arrange treatment ports to treat two or more patients simultaneously. These remarks likewise apply to gamma rays, for we have plenty of gamma radiation of the energy range above a million volts also available for therapy. We have found that the yield of radioactive substances has gone up according to expectations. For example, the yield of radioactive iodine at 16 million volts is twenty times greater than at eight million volts, and we can now manufacture enough of this material to use it for therapeutic purposes, should this prove desirable.

"Crude" Deaths in Large Cities.—The New York City Department of Health has published its annual comparison of vital statistics in twenty-four large cities of the United States for 1938. The cities have a total population of nearly 27,000,000. The general death rate was 10.6 per thousand of population and the infant mortality rate was 42 per thousand live births. The birth rate was 15.3. It is pointed out that the rates for the individual cities are "crude" rates and should not be used as indexes of the relative healthfulness of the cities. Detroit had the lowest general rate, 7.8, and San Francisco the lowest infant mortality rate, 29.6. Other cities with general death rates under 10 were Milwaukee 8.4; Los Angeles 9.3; Rochester, N. Y., 9.6; Chicago 9.7 and New York 9.8. New Orleans with 15.4 had the highest rate in the group and Denver was next with 14. In 1938 seventeen cities had infant mortality rates under 50 and nine of these had rates under 40. In 1929 only two of this number had rates under 50. Among the five cities with populations over a million, the rates for infant mortality were: New York 38.3; Chicago 33.7; Philadelphia 42.2; Detroit 41.4 and Los Angeles 56.8. In these large cities the puerperal mortality was reported to be: New York 3.5 per thousand live births; Chicago 2.7; Philadelphia 3.2; Detroit 3.3 and Los Angeles 3.2. The compilation also listed the death rates from several important causes. New Orleans had the highest typhoid rate, 5.5 per hundred thousand of population; the next highest was Jersey City with 1.2. New Orleans also had the highest tuberculosis death rate, with Washington, D. C., next; these rates were 95.2 and 82.8 respectively. Minneapolis had the lowest tuberculosis rate, 13.6. Denver had the highest diptheria death rate, 4.5, while Boston and Newark, N. J., had the lowest, 0.2. The highest cancer rate was reported from Boston, 203.5, and the lowest from Toledo, Ohio, 70.7. Pneumonia was highest in New Orleans, 150.7, lowest in Detroit, 41.6. The highest automobile death rate was in Denver, 35.2, and the lowest in Milwaukee and Jersey City, 9.5.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 18, 1939.

Medical Students and the War

The recently passed law of conscription for military service affects medical students, as many of them belong to the age group called up. But exemption is granted in the case of occupations of national importance for war purposes. As the fighting services make a considerable demand on the medical profession, it is important that medical students should continue their studies and become qualified. The authorities have decided that a medical student who has passed the first professional examination and completed two terms of anatomy and physiology is a member of a "reserved occupation." He is expected to continue his studies and is not liable for military service or eligible for national service of other kinds. If the necessity for maintaining himself away from home, resulting from the transference of his medical school to another area, causes financial difficulty, no state assistance is available to him. He should consult the dean of his medical school. A student who has not passed the first professional examination and completed two terms of anatomy and physiology is at liberty to continue his medical studies unless and until he is called up for medical service, provided his medical school can continue to provide a vacancy for him in the changed conditions. In the event of his completing the stated period of anatomy and physiology before his age group is called up, he will cease to be liable for military service and will be treated as "reserved." No decision has yet been reached regarding the release from military service of medical students who have reached a stage of the curriculum at which they would ordinarily be regarded as "reserved" but who, because of their prewar commitments to the army, are now serving as combatant officers or in the ranks.

The "Oslo Breakfast" in England

A new method in the feeding of children was presented some seven years ago by an experiment in a school in Oslo. Instead of a hot meal of the usual type served at midday, the children were given a breakfast composed of foods selected primarily with the object of making good the deficiencies in the home diet. The deficiency of animal protein was made good by a piece of goat's milk cheese and a glass of milk, which also supplied minerals and vitamins. There was entire wheat bread to supply vitamin B and the mineral salts lacking in white bread. Protection against scurvy, a danger in northern countries where cheap fruit is available for only a short part of the year, was given by half an apple or orange, a lettuce or a raw carrot, depending on the prevailing prices. In addition there was a good sized pat of butter to add more vitamins A and D. When the child had eaten this meal it was allowed, if still hungry, to fill up with bread and margarine. The experiment was such a success that this meal was adopted in almost every school in Norway and is now being tried out in the other Scandinavian countries. Both the development and the health of children were found to be better than when the hot meal of meat and cooked vegetables was provided.

The "Oslo breakfast" has been introduced into England and found highly satisfactory, but it is given as a dinner instead of breakfast and is called "the health dinner." In his report to the London County Council, just published, the school medical officer, Sir Frederick Menzies, states that the children taking the Oslo meal showed a greater increase in height and weight than children receiving the traditional English hot midday dinner. There was also a striking improvement in complexions and complete disappearance of minor cutaneous troubles. Menzies

finds no evidence of general food shortage among London children but some want of ingredients essential to health which are not easily obtained in the winter months.

Immunologic Problems of Diphtheria

At a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland the president, Dr. R. A. Q. O'Meara, delivered an address entitled "A Critical Consideration of Immunological Problems with Special Reference to Diphtheria." He contrasted the early results of Roux, Martin and Chaillon in Paris in 1894 with those of today. There was evidence that diphtheria in Paris was then associated with the gravis type of bacillus. The mortality in nonlaryngeal cases without antitoxin treatment was over 30 per cent. Antitoxin treatment brought the figure down to 12.4 per cent. In the Cork Street Fever Hospital, Dublin, the mortality in a comparable group of actively treated cases in 1936, 1937 and 1938 was respectively 17.4, 10.5 and 11 per cent. The dose in any case of the early experiment did not exceed 8,500 units and was probably not more than 5,000. Against this, doses of 120,000 units were given in severe cases today. The conclusion appeared to be that there had been no improvement in the treatment of the toxemia of diphtheria since the introduction of antitoxin and that, unit for unit, modern antitoxin was less potent than that originally employed. The principles guiding the development of antitoxin in the interval had been mainly directed toward purification so as to ensure the maximum number of units in the minimum volume, while the study of clinical efficiency had been relegated to a minor position. Diphtheria and other forms of prophylaxis were also suffering from the making of the avoidance of reaction the first criterion of an immunizing agent. The immunologist had been dazzled by the achievements of the chemist in isolating fractions of the organism which had antigenic properties and could be injected without causing reaction. But Pasteur and other pioneers appeared to show that in order to get solid immunity against the causal organism it was necessary to use something close to the whole organism and not a fraction of it. The modern tendency might lead to the abandonment of immunization as of no practical use.

In the discussion, Prof. J. W. Bigger said that serologists and immunologists showed a tendency to become too academic. Antitoxin had definitely reduced the mortality of both gravis and mitis infections, but the treatment had not improved to the extent that might have been expected. Dr. C. J. McSweeney said that the commercial antitoxin now used seemed to check the spread of membrane but had little if any effect on the undefined toxic factor which was responsible for the faucial edema. The hallmark of toxic diphtheria was "the bull neck." To combat this, reactions had to be faced. For a highly virulent organism something more potent than the existing antitoxin was required. Dr. A. R. Parsons thought it difficult to know how much antitoxin to give. Some years ago good results had been achieved by from 4,000 to 8,000 units, but today some workers said that doses should not exceed 100,000 units and were quite safe up to that. Was the present antitoxin not so good as that formerly used? Dr. J. McCann said that in the early days antitoxin was given subcutaneously with good results; now it was given intravenously or intramuscularly. Given in this way many units might be excreted from the blood and lost almost as soon as given. He suggested that antitoxin should be given subcutaneously as well as by the other routes.

In reply O'Meara said that his object had been to show that a problem existed, not to say that antitoxin should not be used in the treatment of diphtheria or that prophylactics should not be employed. In spite of many alleged improvements since the introduction of antitoxin, certain cases of severe diphtheria were not amenable to it. The existing prophylactics gave a high degree of immunity, but parents should not be told that the

FOREIGN LETTERS

JOUR. A. M. A.
Dec. 23, 1939

child would certainly be protected. In immunology there had been too great a gap between laboratory and clinical work. It was important to use the whole organism and not isolated parts or products of it.

PARIS

(From Our Regular Correspondent)

Vitamin C and Work

Nov. 18, 1939.

A recent paper by A. R. Ratsimamanga is devoted to the part vitamin C plays in work. It is well known that the human system does not synthesize the ascorbic acid that is needed in nutrition. He believes in the existence of a close connection between the metabolism of the glucides and the presence of vitamin C and demonstrates this connection by precise methods of dosage and by dietary studies on animals. The role of this vitamin is important also in the formation of glycolytic reserves, which are reduced whenever the supply of vitamin C is diminished. In animals at work there is a progressive decline of resistance to fatigue in keeping with the vitamin C impairment. Mortality and morbidity are higher and weight curves lower. Changes in the chemical processes are brought about by an increase in lactic acid and a decrease in creatine phosphoric acid. Vitamin C deficiency causes adrenal modifications such as cortical hypertrophy and a considerable decrease of the lipids of the zona fasciculata. Vitamin C deficiency is indicated by signs of adrenal insufficiency. All the facts justify the conclusion that vitamin C concentration necessary for the formation of the normal constitution of the adrenal cortex requires a certain adrenal hormone. The fact that this hormone ceases to function when a certain degree of deficiency has set in indicates that ascorbic acid is concerned in the action of this hormone.

The Place of Neurology in Medicine

P. M. Laignel-Lavastine was recently advanced to the professorship of the Clinique des maladies mentales et de l'encéphale in the Paris Faculty. Previously he held the chair of the history of medicine. Laignel-Lavastine delivered his inaugural lecture at the Asile Sainte Anne, in which he paid a tribute to Claude, whose successor he is. Claude, he said, demonstrated that in the majority of minor psychopathic conditions appropriate medication has its place. Hysteria has the power of dissociating certain functional activities, certain perceptions and representations and to fix them in such a fashion that they remain forgotten outside the consciousness, this functional trouble arousing no reaction in the patient. The hysterical person, like the schizophreniac, has lost his sense of reality. Claude took an interest in the reform of the instruction of psychiatry. Unfortunately, the diagnostic technic in psychiatry is often impaired by social or judicial prejudices and also by an exaggerated psychological solicitude. However, psychoscopy, conducted by means of questions and answers, ought not to be underrated, because the reactional coefficient of the patient, his constitution, his temperament and his character determine the nature of his actions.

Thoracic Wounds

In a recent session of the Académie de chirurgie, Desjardins and Clert presented conclusions drawn from twenty-four cases of thoracic wounds. Intervention is now generally recommended. According to the speakers, a distinction must be made between cases in which the thorax is open and those in which no pulmonary lesion is noted. If the lung is exposed, suture of the pulmonary tissue is indicated. If the wound is situated in the precordial region, intervention must be made without waiting for the appearance of cardiac signs or hemato-pericardium. Hemostasis is indispensable. If the base of the thorax is affected, prompt intervention is indicated. The local symptoms will decide whether the path of the projectile should be followed and the thorax attacked or if entry should be made by way of

the abdomen. However, it is better to open the thorax and to make an abdominal exploratory incision than to perform the delicate operation of thoracophrenolaparotomy. The sequel of an intervention in the thorax are usually uninvolved. If the hemothorax is not too abundant it is absorbed; suppuration is exceptional, but often a "secondary aggravation" of symptoms is encountered. An enormous collection of pleural serum develops, because of the presence of clots. Secondary pleurotomy is then indicated.

Aseptic Pus Therapy

The veterinary art at present contributes its experiences to medical therapeutics at the Académie de médecine. During the World War and in the years following more than 370,000 doses of aseptic pus derived from fixation abscesses in horses were employed for the treatment of infectious lymphangitides of horses and other quadrupeds. The active substances of aseptic pus seem to be connective tissue cells and the leukocytes. Miyagawa has shown that inert cells, injected parenterally in weak doses, stimulate the homologous cells of the organism. This effect, according to its authors, M. Belin and C. Belin, is multiple. Proteolysis and conjunctival and epidermic regeneration are clearly accelerated. Besides, aseptic pus has a general stimulating effect. According to observations in several infectious diseases, it heightens the processes of defense of the organism. Mackay, of Budapest, has applied aseptic pus therapy to extensive burns of the second degree. He made an injection of 2 cc. of pus diluted in a 1:8 ratio every two or three days and achieved noteworthy results.

OSLO

(From a Special Correspondent)

Who Has Perfect Health?

Nov. 11, 1939.

Recent correspondence in the *Tidsskrift for den norske lægeforening*, the journal of the Norwegian Medical Association, has focused attention on a problem which is none the less engrossing for being more or less insoluble. It concerns the issue of certificates to the effect that so-and-so is perfectly healthy. It is the fashion now for every employer, public or private, to ask for such a certificate, which is expected to safeguard the employer from claims for compensation on behalf of employees whose health has broken down. It is the state which has set the example and the pace in this field, and now municipal authorities and private concerns have followed suit. Unfortunately, perfect health, like perfect beauty, is an ideal rather than a reality. And it is a poignant irony of modern life that, the greater the advances in medical science, the greater is the number of persons who deviate more or less from the ideal standards of health.

A generation ago the subjects of diabetes, tuberculosis, pernicious anemia, myxedema and many other diseases would not have been applicants for regular work for the simple reason that they would have been incapable of any work. But today there are thousands of diabetic individuals who, thanks to insulin, are much healthier and fitter for work than many an employee whose chief ailment is neurasthenia or insomnia. Then there are the thousands of ex-sanatorium patients whose working capacity has been completely restored by an artificial pneumothorax or some thoracoplastic operation but who cannot be certified as being physiologically and anatomically normal and healthy human beings. Writing on this subject, Dr. H. F. Høst urges the state and municipal authorities to take the lead by revising to a certain extent the high standard heretofore set for applicants for employment. What is needed more than anything else is a readjustment of certain fundamental conceptions in physiology and pathology. For at present prognosis lingers far too stiffly on the morbid anatomy of a bygone generation.

taking quite inadequate account of those vital processes which are so difficult to measure and which yet have the last say in the matter.

Should Public Hospital Diets Be Uniform?

It may seem strange that in Norway a question should arise concerning uniformity of hospital diets. But the inequality of man cannot be ignored, however perfect the doctrines of socialism may be in theory, and even in our public hospitals class distinctions are being made. Dr. Erling Rustung, who is attached to the University Hygiene Institute in Oslo, recently addressed a circular to the 136 hospitals mentioned in the 1938 year book of the Norwegian Medical Association asking the directors to answer several questions concerned with the board and lodging of their patients. He obtained replies from 111 hospitals, in sixty-eight of which it transpired that the board and lodging were the same for all. There were six hospitals in which, on the payment of an extra fee, the patient could have a ward to himself, but even in these cases there was only one dietary. In twenty-nine hospitals single bed wards and better food could be obtained on the payment of an extra charge. There were also eight hospitals with three dietaries at as many different prices.

In their replies to Dr. Rustung, several of the hospital directors commented on this problem of better food for richer patients. One of them wrote that the patient's food in a hospital is a part of his treatment and it is therefore monstrous to draw a dietetic distinction between poor and rich. There can be only one treatment, and that the best. But a few correspondents leavened their socialism with the reflection that the finances of a hospital may be aided by letting the rich pay comparatively big fees in return for certain dietetic privileges. In most cases, however, it is clear that a uniform dietetic standard is that which is most in vogue in Norway and that which is approved of by most of the authorities responsible for hospital administration.

The Norwegian Radium Hospital

Only a few years old, the Norwegian Radium Hospital near Oslo has already become a national institution greatly appreciated by the public. It is to a large extent the child of one man, Dr. S. A. Heyerdahl, who in February 1938 retired as its senior medical officer. His place in this respect has been taken by Dr. Rolf Bull Engelstad, with whose publications on radiologic subjects many outside Norway are familiar. The last annual report of this institution has recently been published and covers the year 1938. More than half the space in this report is devoted to a monotonous tabulation of all the patients who were treated in 1938. The reader is left with the impression of having lost sight of the wood because of the wealth of individual trees in it. Elsewhere in the report there are many items of interest.

In the year under review, 5,607 patients underwent polyclinic examination, only 340 being new patients. In the same period the number of patients receiving treatment was 1,760, and the daily number of patients given resident treatment was on the average between eighty-five and eighty-six, the highest number in one day being ninety-four and the lowest number sixty-eight. The anesthesia induced in 151 cases was varied enough: ether narcosis in nineteen cases, spinal anesthesia in forty-two, local anesthesia in thirty and evipal narcosis in forty-eight. It was noteworthy that there was only one chloroform narcosis. Changes in fashion are also noted in a table showing the operations performed. Here one finds electrocoagulation figuring in fifty-two cases, nineteen of which concerned cancer of the vulva and twelve cancer of the tongue. Exploratory laparotomies were performed in seven cases. The lack of information about late results and follow-up inquiries reflects the fact that this particular hospital is quite new.

BUDAPEST

(From Our Regular Correspondent)

Nov. 15, 1939.

Appeal of Medical Association to Minister of War

After the World War the Hungarian Medical Association made an appeal to the ministry of war as a result of which military surgeons were declared to be of the same rank and with the same pay as combatant officers. Soon, however, the ministry of war found a new grouping necessary and military surgeons were placed in a lower group. The medical profession did not protest against this setback and the active army surgeons accepted the situation obediently. The reserve physicians did not deem this important, since at that time there was no compulsory military service in Hungary and nobody thought there was any danger of a new war. The medical association has again appealed to the ministry of war requesting that physicians in military service be given equal rank with combatant officers. The appeal argues that physicians serving in public hospitals and in the army are indispensable, sharing in all the dangers of war. During the World War many physicians were wounded or killed. The appeal further requested that university professors, lecturers and readers as well as senior hospital physicians and chief physicians of the ambulatories be given adequate rank and pay according to their scientific abilities. At present there are many prominent men in the medical profession listed as subaltern officers in the military registry books. It is expected that the ministry will decide in favor of the physicians, in view of the fact that in almost all neighboring countries military surgeons are equal in rank and salary with combatant officers.

Professor Schaffer Is Dead

Charles Schaffer, retired professor and director of the Budapest Neurologic and Psychiatric Clinic, died in his seventy-fifth year. During his career there was no one more diligent and successful in research on the histology of the brain. He started his work in a laboratory fitted up with his own money in the hospital of the poorhouse; later he moved to Professor Lenhossék's anatomic institute. He was interested in private practice only so far as it seemed necessary in his investigations. In the field of histology of the nervous system his work attracted the attention of the whole scientific world. Professor Schaffer was the greatest of contemporary Hungarian medical scientists.

Marriages

MARVIN A. BLANTON JR., Union City, Tenn., to Miss Katharine Geraldine Martin of Staten Island, N. Y., October 21.

ORION O. FEASTER to DR. ANNETTE BIEKER, both of St. Petersburg, Fla., in Dunedin, November 9.

WILLIAM HUDSON BROOKS, Sardis, Miss., to Miss Grace Evelyn Taylor at Helena, Ark., October 29.

PETER ALEXANDER DROHOMER to Miss Harriett Perry Coley, both of Daytona Beach, Fla., October 24.

GEORGE C. CARLSON, Quitman, Miss., to Miss Christine Wooley of Memphis, Tenn., October 8.

KENNETH HARLAND COWDERY to Miss Dorothy Lois White, both of Warren, Ohio, November 4.

HAROLD JAMES RICKARD to Miss Constance Marcell Gardner, both of Philadelphia, November 8.

JAMES A. DICKSON, Cleveland, to Mrs. Consuelo Proudft of Macon, Ga., in November.

BLISS BARTLETT CLARK, New York, to Miss Carolyn Morse at Montclair, N. J., October 21.

LOUIS KOVITZ, Kansas City, Mo., to Miss Dorothy Allis of Los Angeles, November 23.

CHARLES S. CARTER, Bells, Texas, to Mrs. A. O. Belote of Denison, August 30.

JACK I. WOOLF to Miss Orien Levy, both of Dallas, Texas, September 10.

Deaths

Josiah Newhall Hall * Denver; Harvard Medical School, Boston, 1882; professor of medicine emeritus at the University of Colorado School of Medicine, died December 17 at 80 years of age of pneumonia and myocarditis. He was a member of the Judicial Council of the American Medical Association from June 1921 to June 1931; a member of the House of Delegates in 1903, again in 1906, serving until 1908, and from 1919 to 1921. After practicing in Sterling, Colo., 1883-1892, he moved to Denver. He was mayor of Sterling in 1888-1889. From 1897 to 1902 he was professor of therapeutics at the University of Colorado School of Medicine and professor of medicine at Gross Medical College and later at Denver and Gross Medical College, continuing at the university after the merger of the schools. Dr. Hall was president of the Colorado State Board of Medical Examiners in 1891, of the state board of health in 1903-1904, of the American Therapeutic Society in 1916-1917 and of the Colorado State Medical Society in 1900. He was a fellow of the American College of Physicians and a member of the American Clinical and Climatological Association. During the World War he served as major in the medical corps, first as chief of the medical service at Base Hospital, Camp Logan, Texas, and then as consultant in internal medicine to the base hospitals of the Southwest and Western cantonments. He was on the staffs of Mercy, Denver, St. Joseph's and St. Francis hospitals. In addition to articles on diseases of the heart and lungs, he was the author of "Borderline Diseases," published in 1915, and the section on gunshot wounds, burns and scalds in Peterson and Haines' "Text-Book of Legal Medicine and Toxicology." Quite recently he had published for private circulation his personal reminiscences of a busy and useful life. He was widely beloved as a sincere, earnest, capable physician, as a leader in establishing the ethics and the true tradition of medical service, and as a pioneer in the building of medicine in the West.

Thomas Rundle Neilson * Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1880; emeritus professor of genito-urinary surgery at his alma mater, and formerly emeritus professor at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; member of the American Surgical Association and the American Urological Association; fellow of the American College of Surgeons; past president of the College of Physicians of Philadelphia; consulting surgeon to St. Christopher's Hospital for Children; for many years on the staff of the Episcopal Hospital; aged 81; died, October 25, at his home in Devon, Pa.

Dennis John McDonald, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; formerly adjunct professor of laryngology and rhinology, New York Polyclinic Medical School and Hospital; for many years a member of the board of education; laryngologist to the Misericordia Hospital; laryngologist and otologist to the Dominican Convent of Our Lady of Rosary, New York, and St. Agnes Convent, Sparkhill; aged 74; died, October 8.

John Wesley Hanner * Colonel, U. S. Army, retired Burlingame, Calif.; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; entered the army as an assistant surgeon in 1902; was awarded the silver star and the distinguished service medal for service during the World War; rose through the various ranks to that of lieutenant colonel in 1917; retired in 1922 for disability in line of duty; by a special act of Congress dated June 21, 1930, was retired as a colonel; aged 62; died, October 1.

Albert Charles Moerke * Burlington, Iowa; Bennett College of Eclectic Medicine and Surgery, Chicago, 1896; at one time secretary of the Des Moines County Medical Society; formerly member of the state board of health and of the state board of medical examiners; past president of the Iowa Society of Clinical Surgeons; chief of staff, Burlington Protestant Hospital; on the staff of the Mercy Hospital and St. Francis Hospital; aged 72; died, October 30, of carcinoma of the colon.

Henry Dietrich * Los Angeles; Rush Medical College, Chicago, 1898; emeritus professor of medicine (pediatrics), University of Southern California College of Medicine; member of the American Pediatric Society and member and past president of the American Academy of Pediatrics; aged 63; for many years chairman of the executive committee of the medical staff of the Children's Hospital, where he died, October 16, of coronary thrombosis.

Earle Rogers Whipple * Steelton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; member of the House of Delegates of the American Medical Association in 1930; past president of the Dauphin County Medical Society and of the Harrisburg Academy of Medicine; aged 57; served on the staff of the Harrisburg Hospital, where he died, October 23, of hypertension and heart disease.

L. Edward Villiaume, Buffalo; University of Buffalo School of Medicine, 1903; past president of the Erie County Medical Society; member of the Medical Society of the State of New York; member and past president of the staff of the Mercy Hospital; aged 62; died, October 16, in the Strong Memorial Hospital, Rochester, N. Y., of a head injury received on a golf course about two months previously.

Thomas Richard McHugh * Los Angeles; University of Michigan Homeopathic Medical School, Ann Arbor, 1901; fellow of the American College of Surgeons; formerly assistant professor of surgery at the College of Medical Evangelists, Loma Linda; served during the World War; formerly on the staff of the Queen of Angels Hospital; aged 62; died, October 21.

Herman Trossbach, Bogota, N. J.; Long Island College Hospital, Brooklyn, 1907; member of the Medical Society of New Jersey; fellow of the American College of Physicians; past president of the Bergen County Medical Society; aged 53; on the staff of the Hackensack (N. J.) Hospital, where he died, October 1, of hypertension and chronic nephritis.

George Farragut Raynor, New York; New York Homeopathic Medical College and Hospital, 1900; clinical professor of medicine at his alma mater; served the Metropolitan Hospital in various capacities; associate editor of the *Journal of the American Institute of Homoeopathy*; aged 68; died, November 1, at the Flower Hospital of coronary thrombosis.

John Gailwey * San Francisco; University of California Medical Department, San Francisco, 1885; fellow of the American College of Surgeons; a founder and past president of St. Francis Hospital; formerly member of the board of regents of the University of California and a member of the city park commission; aged 76; died, October 16.

Emil Ries * Chicago; Kaiser-Wilhelms-Universität Medizinische Fakultät, Strassburg, Germany, 1888; past president of the Jackson Park Branch of the Chicago Medical Society and of the Chicago Gynecological Society; member of the Central Association of Obstetricians and Gynecologists; aged 74; died, November 14, of coronary occlusion.

Frederick Herbert Baker, Worcester, Mass.; Harvard Medical School, Boston, 1893; member of the Massachusetts Medical Society; for many years medical examiner for the city; aged 72; formerly on the staffs of the Worcester City Hospital, St. Vincent Hospital and the Memorial Hospital, where he died, October 1, of pneumonia.

Etley Price Smith * Fairmont, W. Va.; Jefferson Medical College of Philadelphia, 1909; fellow of the American College of Surgeons; on the staff of the Cook Hospital; past president of the Marion County Medical Society; served during the World War; aged 57; died, October 18, in Saranac Lake, N. Y., of pulmonary tuberculosis.

Maurice Ralph Zentner, Trenton, N. J.; New York Homeopathic Medical College and Flower Hospital, 1932; member of the Medical Society of New Jersey and the American Society of Anesthetists; on the staff of the William McKinley Memorial Hospital; aged 33; died, October 30, in the University Hospital, Philadelphia.

John Edwin Musgrave, Excelsior Springs, Mo.; University Medical College of Kansas City, Mo., 1907; member of the Missouri State Medical Association; past president of the Clay County Medical Society; served during the World War; aged 61; died, October 28, in the Excelsior Springs Sanitarium.

James Michael Cassidy, West Springfield, Mass.; Georgetown University School of Medicine, Washington, D. C., 1929; member of the Massachusetts Medical Society; aged 35; died, October 4, of burns received when his chair caught fire from a cigaret which he had been smoking before he fell asleep.

Edwin Link Ellis * Maryville, Tenn.; University of Tennessee Medical Department, Nashville, 1903; University and Bellevue Hospital Medical College, New York, 1904; past president of the East Tennessee Medical Association; aged 62; died, October 22, in the Johns Hopkins Hospital, Baltimore.

Alfred Ervan Chesley * Lawrence, Mass.; University and Bellevue Hospital Medical College, New York, 1904; member of the New England Otological and Laryngological Society; for many years on the staff of the Lawrence General Hospital; aged 63; died, October 27, of cerebral hemorrhage.

Willard Ralph Starks, Chatham, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Medical Society of the State of New York; bank president; aged 73; died, October 6, in a hospital at Albany, of lymphosarcoma of the cervical glands.

August Benjamin Hromadka ♂ Santa Monica, Calif.; Northwestern University Medical School, Chicago, 1907; fellow of the American College of Surgeons; served during the World War; aged 59; vice president and on the staff of the Santa Monica Hospital, where he died, October 26.

Doris Ellen Johnson, Youngsville, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1934; member of the Medical Society of the State of Pennsylvania; aged 33; died, October 23, in the Warren (Pa.) General Hospital following an emergency operation for ectopic pregnancy.

William Charles Leary ♂ Springfield, Mass.; Bellevue Hospital Medical College, New York, 1894; in 1934 member of the House of Delegates of the American Medical Association; aged 70; on the staff of the Mercy Hospital, where he died, October 13, of acute leukemia.

William Frederick Reich, Milwaukee; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; member of the State Medical Society of Wisconsin; for many years school physician; aged 69; died, October 12.

James F. Blanchard, Newport, Vt.; University of Vermont College of Medicine, Burlington, 1887; member of the Vermont State Medical Society; formerly acting assistant surgeon in the U. S. Public Health Service; aged 77; died, October 16, of cerebral hemorrhage.

Walter Ernest Boyer, Williamsport, Pa.; Medico-Chirurgical College of Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 60; died, October 22, of acute coronary thrombosis.

David Louis McAninch, Lamartine, Pa.; Jefferson Medical College of Philadelphia, 1879; member of the Medical Society of the State of Pennsylvania; past president of the Clarion County Medical Society; aged 84; died, October 6, of carcinoma of the bladder.

Henry Clifford Gerrard, Springfield, Mass.; University of Vermont College of Medicine, Burlington, 1912; served during the World War; aged 54; died, October 15, at the Veterans Administration Facility, Rutland Heights, of pulmonary tuberculosis.

George Aitken Stevenson, Albert Lea, Minn.; College of Physicians and Surgeons, Keokuk, Iowa, 1880; Rush Medical College, Chicago, 1889; aged 85; died, October 25, in St. Peter (Minn.) State Hospital of arteriosclerosis and bronchopneumonia.

Harry Leo Moskowitz ♂ New York; University and Bellevue Hospital Medical College, New York, 1912; on the staffs of the Beth Israel Hospital and the Jewish Maternity Hospital; aged 50; died, October 31, of carcinoma of the intestine.

Frank Joseph Weigand ♂ Richmond Hill, N. Y.; Long Island College Hospital, Brooklyn, 1900; fellow of the American College of Physicians; on the staff of the Jamaica (N. Y.) Hospital; aged 60; died, October 29, in an automobile accident.

Roy Struble Gibbs ♂ San Bernardino, Calif.; University of Southern California College of Medicine, Los Angeles, 1901; past president of the San Bernardino County Medical Society; aged 69; died, October 30, of arteriosclerotic heart disease.

William Sharp Cranford, Taylorsville, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; aged 68; died, October 31, in the Veterans Administration Facility, Gulfport, of staphylococcal septicemia secondary to abscess of the left leg.

Charles Eugene Parker ♂ Sterling, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; on the staff of the Public Hospital; aged 69; died, October 23, of arteriosclerosis.

Anton Johnson Moe ♂ Sioux Falls, S. D.; Rush Medical College, Chicago, 1897; fellow of the American College of Surgeons; chief of staff of a hospital bearing his name; aged 71; died, October 18, of cardiac decompensation.

Ulysses Simpson Mullins, Atlantic, Iowa; Rush Medical College, Chicago, 1895; past president of the Cass County Medical Society; formerly treasurer of the medical staff of the Atlantic Hospital; aged 67; died, October 11.

M. Clifford Pardee, Brooklyn; New York Homeopathic Medical College and Hospital, New York, 1899; aged 71; died,

October 25, of osteomyelitis of the jaw bone due to radium and x-ray burns and carcinoma of the mouth.

Robert L. Casburn, Sumner, Miss.; Long Island College Hospital, Brooklyn, 1884; aged 82; died, October 3, at the Baptist Hospital, Memphis, Tenn., of uremia, hypertrophy of the prostate and chronic myocarditis.

Maurice A. Neufeld ♂ Chester, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; formerly police surgeon; for many years on the staff of the Chester Hospital; aged 68; died, October 20.

Frank Neely, Pittsburgh; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; member of the Medical Society of the State of Pennsylvania; aged 85; died, October 19, of coronary occlusion.

Robert Jasper Skaife, Colfax, Wash.; Kansas City (Mo.) Medical College, 1902; member of the Washington State Medical Association; formerly county health officer; aged 77; died, October 29, of pernicious anemia.

Clement Willis Sparhawk, Salem, Mass.; Harvard Medical School, Boston, 1884; member of the Massachusetts Medical Society; aged 85; died, October 22, in Watertown of cerebral hemorrhage and arteriosclerosis.

Jules John Delambre, Houston, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1902; served during the World War; aged 61; died, October 28, in Fresno of coronary occlusion.

Alexander C. Ewing, Los Angeles; Hospital College of Medicine, Louisville, Ky., 1876; member of the House of Delegates of the American Medical Association in 1903; aged 90; died, October 3, of senility.

David Brandley Plymire ♂ San Francisco; St. Louis College of Physicians and Surgeons, 1895; California Medical College, San Francisco, 1895; aged 70; was killed, October 15, when he fell down a 60 foot bank.

Malcolm Stalker, Walkerton, Ont., Canada; Trinity Medical College, Toronto, 1878; fellow of the American College of Surgeons; on the staff of the Bruce County General Hospital; aged 86; died, October 18.

Albert G. Huizinga Holmes ♂ Miami Beach, Fla.; Rush Medical College, Chicago, 1893; formerly member of the school board; aged 75; died, October 30, in the Jackson Memorial Hospital of coronary occlusion.

Carl Cutting Corson, Portland, Maine; Harvard Medical School, Boston, 1932; member of the Maine Medical Association; aged 33; on the staff of the Maine General Hospital, where he died, October 3.

Victor Rousseau, Maple Lake, Minn.; University of Minnesota Medical School, Minneapolis, 1905; member of the Minnesota State Medical Association; aged 67; died, October 15, of coronary thrombosis.

Francisco Leopoldo Abad Gonzales, Manila, P. I.; University of California Medical School, San Francisco, 1927; member of the Philippine Islands Medical Association; aged 45; died, October 7.

Henry Leo Doherty, Stoughton, Mass.; Harvard Medical School, Boston, 1920; member of the Massachusetts Medical Society; on the staff of the Norwood (Mass.) Hospital; aged 44; died, October 9.

Maurice Hirsch Grossberg ♂ Cleveland; Western Reserve University School of Medicine, Cleveland, 1922; on the staff of the Mount Sinai Hospital; aged 43; died, October 22, at University Heights.

Alvin Burkett Waite, Huntingdon, Pa.; Medico-Chirurgical College of Philadelphia, 1902; formerly medical director of the Pennsylvania Industrial School; aged 63; died, October 3, of lobar pneumonia.

Hubert Hawthorne London, Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1920; aged 46; died, October 3, in the Broadlawns General Hospital of gunshot wounds.

Adam Bert Fair, Ottumwa, Iowa; State University of Iowa College of Medicine, Iowa City, 1895; member of the Iowa State Medical Society; aged 68; died, October 21, of carcinoma of the prostate.

Hubert Haldane Lee Casselman, Chesterville, Ont., Canada; McGill University Faculty of Medicine, Montreal, 1920; aged 45; died, October 2, at the Royal Victoria Hospital, Montreal, Que.

John Gibbs Lovell, Spokane, Wash.; Northwestern University Medical School, Chicago, 1904; aged 60; died, October 13, in the Santa Monica (Calif.) Hospital of heart disease and hypertension.

DEATHS

JOUR. A. M. A.
DEC. 23, 1939

- Charles Worthington Vishno**, New Haven, Conn.; Yale University School of Medicine, New Haven, 1885; on the staff of the Grace Hospital; aged 78; died, October 2, of bronchopneumonia.
- James Blenkhorn**, Stoneham, Mass.; University of the City of New York Medical Department, 1893; member of the Massachusetts Medical Society; aged 75; died, October 8, of carcinoma.
- Bartholomew Charles Pasuth** ♂ Bridgeport, Conn.; University of Maryland School of Medicine, Baltimore, 1916; served during the World War; aged 48; died, October 6, of coronary occlusion.
- Benjamin Franklin Noland**, Bassett, Va.; College of Physicians and Surgeons, Baltimore, 1881; formerly member of the state legislature; aged 86; died, October 20, of angina pectoris.
- Charles N. Davis**, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1889; member of the American Laryngological Association; aged 78; died, October 21.
- Frank A. Maxwell**, Austin, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1881; University of Nashville Medical Department, 1882; aged 83; died in October.
- Owen Meredith Waller** ♂ Brooklyn; Howard University College of Medicine, Washington, D. C., 1903; formerly a clergyman; aged 71; died, October 12, of cerebral thrombosis.
- Roy John Boynton**, Miami, Fla.; College of Physicians and Surgeons, Boston, 1905; aged 58; died, October 21, in the Dade County Hospital of cerebral hemorrhage and hypertension.
- Madison McCarty McKee**, Bridgeville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; on the staff of the Canonsburg General Hospital; aged 62; died, October 9.
- Thomas C. Neece**, Walnut Ridge, Ark.; Kentucky School of Medicine, Louisville, 1894; member of the Arkansas Medical Society; aged 71; died, October 17, of cerebral hemorrhage.
- Walter John Daly**, Philadelphia; Medico-Chirurgical College of Philadelphia, 1909; served during the World War; police surgeon; aged 52; died, October 17, of coronary thrombosis.
- Kenneth Raymond Parmenter**, Colorado Springs, Colo.; Boston University School of Medicine, 1896; aged 65; died, October 16, in Sudbury, Mass., of carcinoma of the rectum.
- Preston Worley**, San Antonio, Texas; Gate City Medical College, Dallas, 1903; member of the State Medical Association of Texas; aged 67; died, October 8, in New York.
- Albert A. Ogle**, Indianapolis; Chicago Homeopathic Medical College, 1898; member of the Indiana State Medical Association; aged 71; died, October 31, of coronary occlusion.
- Lewis Edward Davis**, Centralia, Pa.; Medico-Chirurgical College of Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; aged 64; died, October 14.
- Ira Robertson Teitworth**, Kingston, Pa.; Medico-Chirurgical College of Philadelphia, 1904; on the staff of the Nesbitt Memorial Hospital; aged 62; died, October 21.
- Charles Otto Schoier**, Jasper, Ind.; University of Louisville (Ky.) Medical Department, 1921; aged 63; died, October 25, in the Daviess County Hospital, Washington.
- William Joseph Hutchinson**, San Antonio, Texas; University of Southern California School of Medicine, Los Angeles, 1909; aged 73; died, October 30, of tuberculosis.
- George M. Brockway** ♂ Phoenix, Ariz.; University of Buffalo School of Medicine, 1890; for many years on the staff of St. Joseph's Hospital; aged 75; died, October 17.
- Wilbur Martin Pearce** ♂ Baltimore; University of Pennsylvania Department of Medicine, Philadelphia, 1893; aged 72; died, October 5, of carcinoma of the right lung.
- Meleatus Bruce**, Richmonddville, N. Y.; Albany (N. Y.) Medical College, 1898; member of the Medical Society of the State of New York; aged 70; died, October 25.
- Willis Adam Turnbull**, Tampa, Fla.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890; aged 71; died, October 23.
- Henry Martin McLaurine**, Lynnville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1876; aged 85; died, October 1, of bilateral bronchopneumonia.
- John A. Beck**, Salinas, Calif.; Hahnemann Hospital College of San Francisco, 1897; member of the California Medical Association; aged 78; died, October 28.
- Theodore Franklin Johnson**, Perry, Iowa; Homeopathic Hospital College, Cleveland, 1876; aged 90; died, October 10, of osteo-arthritis and bronchopneumonia.
- Charles F. Ryan**, Fletcher, Ohio; Medical College of Ohio, Cincinnati, 1885; member of the Ohio State Medical Association, aged 79; died, October 29, in Columbus.
- Howard Jay Westney**, Atlantic City, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1907; aged 54; died, October 18, of arteriosclerosis.
- Arne Wilbur Clouse**, Geneva, Pa.; Rush Medical College, Chicago, 1900; served during the World War; aged 67; died, October 30, of cerebral hemorrhage.
- Avery Constantine Wilkins**, Shreveport, La.; Eclectic Medical Institute, Cincinnati, 1896; aged 68; died, October 26, of malignancy of the biliary tract.
- Rose Marie Merrill-Hyde**, Miles City, Mont.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1896; aged 74; died, October 3.
- Alden Otis Davis**, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1897; aged 67; died, October 11, in the Allegheny General Hospital.
- Aaron D. Sanders**, Corsicana, Texas; Gate City Medical College, Dallas, 1907; aged 68; died, October 21, of cerebral hemorrhage and arteriosclerosis.
- George Adrien Poux**, Guys Mills, Pa.; Jefferson Medical College of Philadelphia, 1915; aged 45; died, October 24, in St. Luke's Hospital, St. Louis.
- James T. M. Lindsay**, Houston, Texas; Meharry Medical College, Nashville, Tenn., 1894; aged 76; died, October 5, in the Houston Negro Hospital.
- William Edward Conlan**, San Francisco; University of California Medical Department, San Francisco, 1886; aged 77; was found dead, October 20.
- Edwin C. Brinkerhoff** ♂ Bicknell, Utah; Washington University School of Medicine, St. Louis, 1928; aged 41; died, October 24, of uremia.
- George W. Fockler**, Delavan, Ill.; Jefferson Medical College of Philadelphia, 1887; aged 76; died, October 28, of carcinoma of the prostate.
- Edwin Harvey Durgin**, Cupertino, Calif.; Boston University School of Medicine, 1889; aged 75; died, October 14, of coronary occlusion.
- Franklin Schaufelberger**, Hastings, Neb.; Jefferson Medical College of Philadelphia, 1894; aged 72; died, October 9, of coronary occlusion.
- Francis M. Martin**, East St. Louis, Ill. (licensed in Indiana in 1898); aged 85; died, October 23, in Belleville of bronchopneumonia.
- Rufus Charles Harris** ♂ St. Louis; Missouri Medical College, St. Louis, 1898; aged 63; died, October 10, in St. Mary's Hospital.
- Margaret White Cutting**, Agnew, Calif.; University of California Medical Department, San Francisco, 1909; aged 60; died, October 8.
- Michael Baker**, Denver; Gross Medical College, Denver, 1889; formerly postmaster of Evergreen; aged 85; died, October 25.
- George R. Ford**, Trinidad, Colo.; Kansas City (Mo.) Hahnemann Medical College, 1905; aged 77; died, October 28.
- Frederick John Walker**, Wheatley, Ont., Canada; University of Toronto Faculty of Medicine, 1905; died, October 14.
- Edwin Forrest Moore**, Vista, Calif.; Kansas City (Mo.) Medical College, 1886; aged 83; died, October 13, in San Diego.
- Earl Leslie Bennett**, Long Beach, Calif.; Jefferson Medical College of Philadelphia, 1914; aged 54; died, October 12.
- Cicero Fain Peck**, Somerville, Ala.; Memphis (Tenn.) Hospital Medical College, 1890; aged 76; died, October 4.
- Ira Carleton Ratterree**, Los Angeles; College of Physicians and Surgeons, Little Rock, 1910; aged 53; died, October 17.
- William M. Lottridge**, Littleton, Ill.; Columbus Medical College, 1880; aged 89; died, October 21, of heart disease.
- Jacob Louis Brower** ♂ New York; Long Island College Hospital, Brooklyn, 1905; aged 66; died, October 15.
- John L. Bradley**, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1894; aged 70; died, October 14.
- Robert S. Magee**, Long Beach, Calif.; Kansas City (Mo.) Medical College, 1890; aged 78; died, October 14.
- John W. Barnes**, Cato, N. Y.; Chicago Homeopathic Medical College, 1887; aged 82; died, October 8.
- Joseph J. Stewart**, Lamar, Ark. (licensed in Arkansas in 1903); aged 83; died, October 15.

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States
Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Alkalade.—De Pree Co., Holland, Mich. Composition: Chiefly baking soda, sodium phosphate and citric and tartaric acids. Fraudulently represented to "alkalinize" the system, dispel fatigue and "lack of pep" and to be "safe and harmless."—[N. J. 29793; March 1939.]

Astone Tablets.—Astone Products Co., Lansdale, Pa. Composition: Essentially corn starch, sugar, and plant material, including ephedrine. Fraudulently represented as a remedy for asthma, bronchitis, chronic coughs, la grippe and whooping cough.—[N. J. 30009; May 1939.]

Barbetigo.—Barbetigo Co., Salt Lake City. Composition: Water and zinc sulfate (18.2 Gm. per hundred cubic centimeters). Fraudulently represented as a germicide and a remedy for pyorrhea, tonsillitis, athlete's foot and some other conditions.—[N. J. 30005; May 1939.]

Bromo-Ease.—Honoroff Laboratories, Inc., Chicago, and Better Products Co., Marion, Ind. Composition: Acetanilid (6.33 grains per ounce) and small amounts of caffeine, citric acid and baking soda. Fraudulently represented as giving relief in stomach disorders.—[N. J. 29798; March 1939.]

Gayola.—D. R. C. Devine, Philadelphia. Composition: Chiefly epsom salt, baking soda and tartaric acid, with small amounts of salicylic acid and aspirin. For indigestion, arthritis and neuritis. Fraudulent therapeutic claims.—[N. J. 29785; March 1939.]

Etola.—Aryan Herb-an-Tonics Co., Gary, Ind. Composition: Chiefly extracts of plant drugs including hydrastis, volatile oils, including sandalwood and cubeb, with balsam copaiba and water. Fraudulently represented to cure gonorrhea, stricture, prostate trouble, bladder infections and "weak manhood."—[N. J. 30015; May 1939.]

Effervescent Alkaline Tablets.—Honoroff Laboratories, Chicago. Composition: Chiefly baking soda, cream of tartar, citric acid, acetanilid (1.1 grains per tablet) and aspirin. Misbranded because amount or proportion of acetanilid not declared on label and because fraudulently represented to be a remedy for rheumatism.—[N. J. 29798; March 1939.]

Effervescent for Headaches.—Honoroff Laboratories, Inc., Chicago, and Better Products Co., Marion, Ind. Composition: 14.24 to 14.91 grains of acetanilid per ounce in different consignments. Declared adulterated and misbranded because of false labeling of acetanilid content.—[N. J. 29798; March 1939.]

George's Compound.—Nick A. George, Casper, Wyo. Composition: Essentially sodium salicylate, extracts of plant drugs (including hops), sugar and water. Fraudulently represented as virtually a cure-all.—[N. J. 29781; March 1939.]

Hessel's Oil.—Vita Laboratories, Philadelphia. Composition: Essentially peppermint oil. Fraudulently represented as a remedy for asthma, diarrhea, hay fever, heart trouble, paralytic stroke and many other conditions.—[N. J. 30004; May 1939.]

Hetone.—Astone Products Co., Lansdale, Pa. Composition: Chiefly boric acid, ephedrine, and a small amount of chlorbutanol dissolved in water. For hay fever, catarrh, sinus trouble, bloodshot, smarting or watery eyes, etc. Fraudulent therapeutic claims.—[N. J. 30009; May 1939.]

Juvenol.—Himalayan Research Laboratories, Santa Monica, Calif. Composition: Essentially mineral oil (about 27 per cent) and fatty oils including castor oil. Declared adulterated because not wholly composed of vegetable oils as represented; misbranded because fraudulently represented as a "rejuvenator" and as a remedy for kidney stones, gallstones, obesity, rheumatism and some other disorders.—[N. J. 30002; May 1939.]

Kane's Gen-Sen.—Kane Laboratories, Portland, Ore. Composition: Essentially senna leaves, saffrair bark, licorice root and baking soda. Fraudulently represented as a "general tonic" and a remedy for kidney, liver, stomach and blood disorders.—[N. J. 30008; May 1939.]

McCane's (Dr.) Pep Tonic.—Queen Ann Co., Atlanta, Ga. Composition: Essentially an aqueous solution of iron chloride, epsom salt and sodium lactate, with small amounts of plant material and an unidentified alkaloid. For kidney, liver, stomach, blood and heart disorders, etc. Fraudulent therapeutic claims.—[N. J. 29794; March 1939.]

Trainer's Famous Oil.—Kane Laboratories, Portland, Ore. Composition: Chiefly gasoline, menthol, and oils of mustard and turpentine. Misbranded because falsely represented as a "rattlesnake oil" and because fraudulently exploited as useful in paralysis, deafness, rheumatism, pleurisy, hay fever, asthma, etc.—[N. J. 30006; May 1939.]

Correspondence

"TIME MARCHES ON"

To the Editor:—I had another check made on the facts in *Time's* "Misery Harbor" story of December 4. Since then you have published an editorial "Time Marches On" in the December 9 issue of *THE JOURNAL*. Your telegram will appear in the "Letters" column of the current issue of *Time* (December 18) with editorial comment. Your editorial is such an abusive attack that I want to answer it in detail.

It says:

The article in *Time* is mentioned here because it is replete with absolute misstatements of fact beyond anything of a similar character published in the field of medicine even in that periodical during recent years.

And then adds:

Indeed the article betrays a carelessness almost incomprehensible in a periodical which has in the past frequently gone to extended lengths to secure accuracy.

The "extended lengths" to which *Time* went to secure accuracy in the "Misery Harbor" story are as follows: Material on the situation in Cook County Hospital had been gathered since October 1938. Before *Time's* story was written, an editorial assistant personally interviewed in Chicago the principal persons involved. They were Dr. Karl A. Meyer (former medical superintendent of the hospital), Dr. Marshall Davison (present superintendent), Dr. Irving S. Cutter (chairman of the special committee which investigated the hospital in 1937). These were supplemented by telephone interviews with Dr. J. Roscoe Miller (assistant dean of Northwestern University Medical School, of which Dr. Irving S. Cutter is dean); Dr. Raymond W. McNally (chief of staff at Cook County Hospital and the hospital's representative at various committee meetings); an assistant in A. M. A. Education Secretary William D. Cutter's office; the secretary to Dr. Malcolm T. MacEachern (associate director of the American College of Surgeons and director of its hospital activities). In addition, we consulted, of course, the "Report of Committee on Survey of Cook County Hospital," September 1937, which outlines in detail the unfortunate conditions then prevailing at the hospital, newspaper articles on the situation (particularly those appearing in the *Chicago Tribune*) and *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. We did not, as you recommended in your editorial, secure the facts "merely by the use of the telephone." If we had gotten our facts by telephone from you, our story—judging by your editorial—would not have given a very enlightening account of what happened at Cook County Hospital. And incidentally, when one of our editorial assistants telephoned you in the fall of 1938 to discuss Cook County Hospital, you declined to discuss the matter and referred the question to Dr. Irving S. Cutter.

Now let's take up the eleven "errors" which you listed in your editorial. Italicized are the points as published by you (first the statement made by *Time* and then what you call the "correct statement"). My comment follows each:

1. "During the last four years Cook County Hospital has been a battleground for two warring medical factions." There has been no battle between two warring medical factions.

You leave the entirely false impression that there actually has been no real controversy. What would you call the situation? It has long been a matter of common knowledge. The *Chicago Tribune* (whose medical adviser, as you stated in your telegram, is Dr. Irving S. Cutter) quoted (Oct. 18, 1938) Dr. Meyer as saying in connection with the removal of the hospital from the approved list by the College of Surgeons:

The doctors at this hospital have taken this sandbagging just about as long as they are going to. There is less politics in the County Hospital than in any other institution in the city.

We'd be glad to have a comparative study made, banking our institution against any or all of them in the city. But they (American College of Surgeons and American Medical Association) won't tell us what they think is wrong—they just keep on making indirect attacks.

On Nov. 18, 1939, the *Tribune* said:

County commissioners, hospital officials and A. M. A. officials said the appointment will end the long controversy over administration of the county hospital.

2. "Last week a compromise ended the fight." There has been no compromise.

What do you call it when each side gets something and a settlement is reached? Early in 1939 the citizens' committee urged the ouster of Dr. Meyer but the Board of Commissioners of Cook County refused to comply. In May the committee made a concession: it suggested that Meyer be made superintendent of all county institutions and a new medical superintendent be appointed. This is what the board finally did, as well as adjusting a number of other differences.

3. "Dr. Meyer never required the hospital's army of interns to attend postgraduate classes or lectures." Lectures and conferences for interns have been held for at least ten years.

As put by you, *Time's* statement appears incorrect. It was not. Lectures have been held but Dr. Meyer never required the interns to attend, believing, as he did, that experience was what interns needed. The element of compulsion, not the existence of lectures, was the point of difference.

4. "The American Medical Association . . . believes that all interns should taper off into actual practice with at least eighty hours of medical lectures during internships." No specific number of hours of instruction has ever been mentioned, much less required, by the Council on Medical Education and Hospitals.

Our reporter was given to understand that the hospital has agreed to require eighty hours of lectures during eighteen months' internship. This would conform with the "Essentials in a Hospital Approved for Training Interns," set forth in *THE JOURNAL* (Aug. 26, 1939, p. 793): "At least a weekly period should be arranged for conducting clinical-pathological conferences, x-ray lectures or other special lectures or clinics for the interns."

5. "Consequently, four years ago, the A. M. A. dropped Cook County Hospital from its list of approved hospitals." Obviously the number of lecture hours was in no wise involved.

Considering that the American Medical Association sets a "weekly period" for lectures as standard for training interns, it is by no means obvious that the number of lecture hours is not involved. To *Time's* reporter the participants in the controversy spoke of it as a major issue.

6. "Over this point Cook County's Dr. Meyer and A. M. A.'s education secretary, Dr. Irving Samuel Cutter . . ." Dr. Irving S. Cutter is not the A. M. A.'s education secretary; he is Dean of Northwestern University School of Medicine.

We referred to the right man; I admit we gave him the wrong title. Dr. Irving S. Cutter, dean of Northwestern University Medical School, was chairman of the Committee on Survey of Cook County Hospital, has long been interested in the hospital's affairs, but his relative, Dr. William D. Cutter, is actually secretary of the A. M. A. Council on Medical Education and Hospitals. He too has been closely connected with Cook County Hospital. Both scrapped with Dr. Meyer. Hence the confusion and slip, which we are correcting in our "Letters" column this week.

7. ". . . thus automatically cutting off Dr. Meyer's supply of interns from topflight medical schools." At no time has the County Hospital failed to obtain interns from the four recognized medical schools of Chicago. No others are eligible for appointment.

Time would have stated the situation more precisely by saying "topflight interns from Chicago medical schools." Any promising medical school graduate who had a choice of internships would think twice before choosing a hospital without A. M. A. approval—for obvious reasons.

8. ". . . A. M. A. last spring brought public opinion to bear." At no time has the A. M. A. made any attempt to influence public opinion concerning the County Hospital. It has studiously refrained from comment upon the situation.

Public opinion was brought to bear by the citizens' committee, which represented the attitude of the A. M. A. (see

point 11). As to A. M. A. comments, have you forgotten the article in *THE JOURNAL* (Dec. 3, 1938, p. 2127) stating that the A. M. A. Council on Medical Education and Hospitals "found itself in fullest accord" with the recommendations of the Committee on Survey of Cook County Hospital and in which the Council urged the appointment of a physician experienced in hospital management as assistant to Warden Brigadier General Manus McCloskey? Also, has not the A. M. A. made various recommendations with respect to the hospital? Dr. Malcolm T. MacEachern (Associate Director of the American College of Surgeons) stated in the *Hospital Council Bulletin* (September 1938):

And finally the public is asking another question, "What is to be the future of the Cook County Hospital?" This remains undetermined but one can safely say that if the content of the Cutter report, backed up by recommendations made in reports submitted by the American College of Surgeons and the American Medical Association, were carried out to the fullest extent and in the truest spirit, without interference politically or otherwise, the County Hospital would attain the highest pinnacle of respect, success, and efficiency.

9. "An A. M. A.-inspired citizens' committee . . ." The A. M. A. had nothing whatever to do with the "Citizens' Committee" which was appointed by the Board of County Commissioners upon the recommendation of a committee of hospital experts previously employed by the County Board to investigate and report upon conditions at the County Hospital.

The A. M. A. Council on Medical Education and Hospitals (*THE JOURNAL*, Dec. 3, 1938, p. 2127) expressed approval of the report recommending that the citizens' committee be formed. Dr. Irving S. Cutter made himself "available" to the citizens' committee as adviser. The A. M. A. and the citizens' committee were spoken of interchangeably by the participants.

In 1938 hospital officials were reported seeking an A. M. A. survey of the hospital. The *Chicago Times* (Oct. 20, 1938) stated:

The American Medical Association will be asked to make a survey of the Cook County hospital, Dr. R. W. McNealy, president of the hospital medical staff, said yesterday. . . . Clayton F. Smith, president of the county board, said he favored Dr. McNealy's request to the A. M. A. . . .

And Dr. William D. Cutter (secretary of the A. M. A. Council on Medical Education and Hospitals) was quoted in the *Chicago Tribune* (Nov. 18, 1939) as saying:

The appointment of Dr. Davison is evidently an effort to fulfil the recommendation of the American Medical Association and the citizens' committee. No action (on the hospital's reinstatement) can be taken by the council until its meeting December 10.

10. Said committee " . . . hinted that the hospital might be reinstated on the A. M. A.'s list if a new director acceptable to the A. M. A. were chosen." As stated above, the Citizens' Committee had no connection whatever with the A. M. A. and therefore could not and did not claim to represent it.

Time did not say that the citizens' committee claimed to represent the A. M. A. But the committee hinted broadly, as appeared in the *Chicago American* (March 15, 1939):

Both Charles H. Schweppe, chairman of the committee and Dr. (W. D.) Cutter said replacement of Dr. Meyer by a medical head devoted full time to the hospital would help restore the institution to the accredited list.

11. "(2) Cook County was promised reinstatement on the A. M. A.'s list same time around Jan. 1; . . ." No such promise was given.

Yesterday, December 11, Cook County Hospital went back on A. M. A.'s approved list. If A. M. A. did not promise to restore the hospital to its approved list the coincidence is remarkable. But *Time* was not alone in finding that the hospital reorganization plan and A. M. A. approval were interwoven. Apparently most of the reporters in Chicago also found it out. Examples:

The *Chicago Times* (Nov. 19, 1939):

The A. M. A. announced, the Cook County Hospital will be returned to its list of hospitals approved for internship. The announcement followed appointment of Dr. Marshall Davison as medical director of the institution.

The *Chicago Tribune* (Nov. 18, 1939):

The American Medical Association soon will restore the Cook County Hospital to its list of hospitals approved for internship. This became certain yesterday with the county board's appointment of Dr. Marshall Davison to succeed Dr. Karl A. Meyer as hospital medical director.

The Chicago American (Nov. 17, 1939):

In announcing the appointment, Clayton F. Smith, president of the County Board, said it had the approval of the American Medical Association. Smith was hopeful that Dr. Davison could restore the hospital to the A. M. A.'s approved list, from which it was dropped a year ago.

Obviously, *Time* did not let A. M. A.'s cat out of the bag, but apparently you decided that you would like to bag a cat that has been running around free—and your method of doing so is to attack *Time*. As an unfair attack, I believe THE JOURNAL editorial goes "beyond anything of a similar character published even in that periodical during recent years."

MANFRED GOTTFRIED, New York.

Managing Editor of *Time*.

COMMENT.—1. *Time's* answer is to quote Karl Meyer and the Chicago Tribune as though they were infallible.

2. The Citizens' Committee, the Council and the College of Surgeons asked for the appointment of a "medical director." They got what they asked for.

3. Technically, *Time's* answer is correct, but its original statement conveyed the implication that there were no lectures, which was incorrect.

4. *Time's* answer is irrelevant.

5. Same as No. 4.

6. *Time* has admitted its error.

7. Same as No. 6.

8. The American Medical Association has at no time attempted to influence public opinion on this question. No statement about the Cook County Hospital situation has appeared in the editorial columns of THE JOURNAL; merely an official statement by the Council regarding the hospital's removal from the accredited list.

9. The fact that the Citizens' Committee arrived at the same conclusion as the Council surely does not justify the statement that the committee was "inspired" by the Council.

10. *Time* relies on a quotation from the Chicago American, March 15, 1939, which had no basis in fact.

11. The claim that the Council promised approval to the County Hospital is based on the fact that the hospital actually was approved. Such fallacious reasoning needs no further comment.—ED.

DOCTORS ON STAMPS

To the Editor:—Do you not feel that the opportunity is at hand to give a small measure of recognition to a group which has thus far been sadly neglected?

I refer to your editorial to the effect that two physicians are to be honored by an issue of postage stamps.

No one, I am sure, would wish to detract from the recognition and honors that Reed and Gorgas have received for their part in the yellow fever work. But some of us have long wondered, down through the forty years that has elapsed, why the acting assistant surgeons who served on the Yellow Fever Board, in comparison, have received such scant attention.

Agramonte, writing in 1915, stated that the definite promise was made when this board assembled that any credits or honors accruing from the board's labors would be shared by all alike. Comment on this aspect of the case is unnecessary.

Now, in all earnestness, Mr. Editor, might not that curtain which hangs before the eyes of justice be lifted a little so that occasionally it might be remembered that Lazear, Carroll and Agramonte were members of this board, all of whom were picked for their accomplishments and all of whom performed to their utmost?

Would it not be a gesture of human appreciation for the American Medical Association to suggest that one of these three receive this contemplated honor?

HARPER PEDDICORD, M.D., Redwood City, Calif.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

UNEXPLAINED FEVER AND AIR CONDITIONING

To the Editor:—Recently a patient consulted me because of recurrent bouts of unexplained fever. They occurred once every one or two months and came on around 6 p. m. and lasted until about 10 p. m. The maximum elevation of temperature has been 103 F. The next morning the patient feels completely well. Interesting enough is the fact that, at the time the patient has his bout of fever, fourteen or fifteen of his co-workers have a similar experience. All of these men are employed in an air conditioned office. Careful physical and laboratory examinations have been completely negative. Food poisoning cannot be a factor because most of these people take their meals at different places. Quinine given as a therapeutic test according to the Ross standard treatment for malaria has been of no value in preventing recurrences. I have been wondering whether it is not possible that, after these men have worked in an office at a temperature of 78 F., going abruptly into a temperature of around 100 might not in some way derange the mechanism that regulates the body temperature and produce this fever. If there are any available reports on such a possibility I would appreciate a reference.

Morgan W. Matthews, M.D., Shreveport, La.

ANSWER.—These occurrences of occasional but synchronous evening fevers in a group of workers in an air conditioned office are difficult to account for from known facts in the matter of the body temperature regulating mechanisms. Were all the fifteen workers in that office checked by competent physicians as carefully as this one patient or did they just report "feeling feverish" or "uncomfortably hot" the previous evening, after hearing the recital of this patient's evening experience on the following morning? The time 6-10 p. m. is in general the high peak of the daily body temperature curve. It is also a fact that the speed of adjustment to external temperature variations varies somewhat in apparently normal persons, the extremes being the rare individuals with a greatly reduced quantity of sweat glands. But it does not seem probable that all the fifteen workers in the office could fall in this one group. Were any of the workers free from the disturbance? And did the incidence of fever occur only on days of exceptionally high humidity? The fact that the fever appeared only once every thirty or sixty days shows clearly that the lag in the body temperature regulatory machinery in persons adjusted to 78 F., when passing suddenly into 100 F., cannot be the only controlling factor. This lag does occur. The degree and duration probably vary somewhat with the individual. In the writer, who has experienced it, the elevation of the body temperature never exceeded 1.5 degrees F. and never lasted as long as four hours. Air conditioning is now so common that if the incidents described were effects of merely a sudden change of environmental temperature from 78 F. to 100 F. there should be millions of such cases by this time. But it is a fact that such sudden temperature changes, in either direction, make one "feel" excessively hot or cold, more so than one can account for on the basis of actual changes in the body temperature. The vasomotor mechanism of the skin appears to adjust itself rather promptly to external temperature changes. The sweat secretion mechanism seems more variable and its efficiency is, of course, largely a matter of the humidity of the air. There is in all probability some lag in the adjustment to external temperature of the heat production in the skeletal musculature (variations in "tone").

EATING GLASS

To the Editor:—Would the inclusion of ground glass in ingested food be fatal to the individual who took it, or is it possible for the average person to chew up and swallow glass from an electric light bulb without injury, as is said to have occurred in a recent court trial?

M.D., Conn.

ANSWER.—The ingestion of glass may or may not be fatal. The nature and extent of the harm done, if any, depends on the size, shape and number of particles ingested and on the presence or absence of food in the mouth with the glass or in the gastrointestinal tract at the time the glass is swallowed. The danger lies in perforation of the wall of the stomach or the intestine and in acute or subacute gastro-enteritis. It would hardly be safe to say that the average person can chew up and swallow glass without suffering immediate injury, but it seems to be beyond question that some persons can do so. Dr. Walter S. Haines (Death from Pounded Glass and Other Mechanical Irritants, in Legal Medicine and Toxicology, by Many Specialists, ed. 2, vol. II, edited by Frederick Peterson, Walter S. Haines

and Ralph W. Webster, Philadelphia, W. B. Saunders Company, 1923, pp. 888-897) reported a case in which "a professional glass eater," in the presence of Dr. Haines and of Dr. E. F. Ingals, ate half a dozen 6 inch test tubes, two good sized lamp chimneys, an ordinary 4 ounce medicine bottle, two pieces of window glass, each 4 inches square, and three slips of colored glass each 1 inch wide and 3 inches long, biting the glass off the pieces offered him, chewing it up, and swallowing it much as if it had been an ordinary article of food. The glass eater had eaten a hearty meal before submitting to the test, as was his custom before each exhibition. He was kept under observation for several hours after eating the articles named but at no time did he show any unfavorable symptoms. He died, however, two or three years later, from a subacute gastro-enteritis, presumably, Dr. Haines says, from the irritation produced by his long continued glass eating. There are other well authenticated reports of similar purport.

ATTACKS OF ABDOMINAL CRAMPS

To the Editor:—A white man 33 years of age is in comfortable financial and social status and is in a profession that does not require physical activity but does entail great mental strain. He was in his usual state of health until seven years ago, when he sustained a "contused" right kidney in an automobile accident. For several weeks following the accident he had red cells in the urine, but this cleared up under treatment. From then until three years ago he was well. At this time (three years ago) he began to have bouts of abdominal cramps, generalized and severe. These come on with a regularity and follow no dietary indiscretions, nor do they follow the ingestion of any particular foods, although they have a direct relationship to mental strain and worry. The pains last from eighteen to thirty-six hours and then pass away. At the peak of the pain, sedation is sometimes necessary. The attacks have become more frequent in the last year. He has been examined during the attacks by a competent surgeon who states that no surgical condition is present. The temperature, pulse, respiration and blood pressure are normal even during the attack, although there is a slight rise in blood pressure. The white count and the differential count are normal also. A complete gastrointestinal study including many x-ray plates reveals a retrocecal appendix and evidence of a spastic colon. Proctoscopic and sigmoidoscopic examinations as well as fecal examinations have yielded negative results. Can there be any relationship between the injury and these attacks? Will spastic colitis cause such a history? If we can assume such a diagnosis can you suggest a regimen which will cause relief? If the disease is spastic colitis, can you refer me to some literature on the condition?

M.D., Pennsylvania.

ANSWER.—The present trouble is probably not associated with the injury, although careful x-ray studies with intravenous pyelograms should be done. In a patient of this type functional disturbances of the colon are common and are capable of causing severe abdominal pain. It is unusual, however, for it to appear in isolated attacks, and the bowel function is usually disturbed. Before the diagnosis of spastic colitis is made, duodenal stasis must be considered as well as partial obstruction in the small intestine. These may not be discovered by fluoroscopic study except during the attack. It is also of great importance to note whether the pains are rhythmic. If the examinations fail to reveal any organic trouble, it seems fair to assume that the patient has a functional disturbance. In treatment it is necessary to have the complete confidence of the patient and suitable diet to relieve the spasticity of the colon. The chapter on irritable colon in Oxford Medicine gives valuable information and may be of help in this case.

FOLLICULITIS OF SCALP: DIFFERENTIAL DIAGNOSIS

To the Editor:—I have on several occasions had cases in which small "shot-like" places under the scalp were complained of which later seem to come to the surface and break down, discharging a small amount of puslike fluid. These elevations seem to be found on areas having some hair and seem to "shun" bald spots. There is considerable itching, but outside of that patients do not seem to complain. I have tried painting with iodine, silver nitrate and phenol, and while these substances give relief there are new crops of the elevations at other areas of the scalp. Will you also tell me the etiology of this condition? I have been unable to find it described in the books at my disposal.

M.D., Chicago.

ANSWER.—It is difficult to make an unequivocal diagnosis in this case without more definite information about the character of the individual lesions, the course of events once they appear and the final result of their presence. Several entities come to mind for consideration. Perifolliculitis capitis abscedens et suffodiens is characterized by nodules and abscesses occurring on the scalp and terminating in scars. The nodules may be up to the size of a walnut. They are solid or fluctuant, colorless, yellow or livid. The lesions may be connected by sinuses and are devoid of hair. They exude a thin pus that dries into crusts. X-rays, vaccines and a sulfur paste have been employed with benefit. It is doubtful whether this is the correct diagnosis, because mention is not made of resulting bald spots, nor do the lesions in this patient seem to be large enough, nor do they burrow.

Acne varioliformis or necrotica should be considered. This is characterized by the occurrence over the brow, scalp or other regions of discrete, exceedingly indolent, reddish brown, papulopustular, often umbilicated, lesions which become covered with crusts and eventually leave depressed, superficial scars resembling those of smallpox. There may be few or many lesions. There is commonly a well marked coincident seborrhea. Many of the lesions are traversed by lanugo hairs. The subjective sensations are slight; at times there is itching. The disease tends to recur and is exceedingly chronic in its course. The treatment is with antiseptic lotions or ointments containing ammoniated mercury, resorcinol, sulfur, mercury bichloride and staphylococcus toxoid. Since this entity affects nonhairy portions as well as hairy ones, it may not be the fitting diagnosis in this case.

Acne necrotica miliaris of the scalp, described by Lane and also by Montgomery, is a more likely diagnosis, a folliculitis affecting the scalp of adults. The pustules are minute and usually few. There are rarely more than three or four present at a given time. They are always situated in the hair follicle and are of yellowish tinge. They soon rupture or are scratched and become capped with a crust which is not infrequently hemorrhagic. The disorder is persistent, lasting indefinitely when untreated. It is accompanied by subjective sensations of variable degree. Often the itching is severe.

Some form of folliculitis is undoubtedly present. This probably is on a seborrheic basis. Mercurials such as metaphen 1:25,000 may be used locally even after no lesions remain. Bacteriophage has been used locally with benefit in some cases of folliculitis of the scalp.

LUENBACH-KOEPPE PREGNANCY TEST

To the Editor:—Would you please tell me of what value is the Luenbach-Koeppel test for pregnancy?

Hymel Fishkin, M.D., Creighton, Pa.

ANSWER.—The Visscher-Bowman test has been definitely discarded by even its original proponents. Because of the great difficulty in reading an end point the test must be considered of no great value, and it is recommended that it be not used in the interest of accuracy and scientific medicine. The Luenbach-Koeppel test is definitely a modification of the Visscher-Bowman test and therefore must be considered in the same category.

ULCERATIVE COLITIS AND PREGNANCY

To the Editor:—A woman, aged 36, who has had chronic ulcerative colitis for the past four years, is anxious to have another baby. She has had three normal spontaneous deliveries. The three children are in good health. She has had several complete and thorough work-ups and regimens of treatment by several capable physicians. On one occasion they isolated a specific micro-organism. However, this was never found again. On and off she has had spontaneous periods of relief, and then she would get recurrences. Her medical history is negative and she has no other sicknesses. In the past few months she has been treated by a proctologist for pruritus ani with relief. She is the nervous and active type. Is it advisable for her to become pregnant, and is there any contraindication?

M.D., New York.

ANSWER.—The problem of pregnancy and its association with the diseases known as chronic ulcerative colitis has been discussed in an article on this subject by J. Arnold Bargen, Calisto Jose Nunez and Robert D. Mussey in the *American Journal of Obstetrics and Gynecology* (38:146 [July] 1939). While no exact answer can be given to the question because of the fact that no one's experience with this combination of circumstances has been large, these authors have made an attempt to find the answer in a review of the case histories of seventeen women who had eighteen deliveries and four miscarriages. They found that nine of the patients who had active ulcerative colitis were improved after delivery. In five the symptoms of the disease became worse. Three of the patients who had miscarriages were improved. The disease started after delivery of one patient. In three the symptoms were unchanged and in one case after miscarriage the symptoms were unchanged. In general it can be said that the combination of circumstances, namely pregnancy in an individual with ulcerative colitis, while it can become serious, does not present unsurmountable difficulties. Why some should be improved after pregnancy is a question that has not been answered. The fact that some became much worse has led these authors to feel that it is probably best in cases of chronic ulcerative colitis to try to avoid pregnancy. If, however, pregnancy occurs, a number of patients have been carried through an uneventful pregnancy by careful management of the colitis. It would seem reasonable for women who have had the disease and who have become free from symptoms to consider freedom from symptoms for two years as a minimal time before becoming pregnant.

NO LOSS OF LIBIDO FROM HYPERTYREXIA
To the Editor:—A man of 65, with long-standing central nervous system syphilis, had to have a series of hypertyrexia treatments about six months ago for a neuritis. He states that his sexual power diminished abruptly following these treatments, in which the fever was induced by short wave diathermy. He insists that his erections were good and his libido normal prior to the treatments. Is this a common sequel of the short wave treatment or has the treatment probably nothing to do with the lost libido, considering the man's age and affliction?
M.D., California.

ANSWER.—There have been no cases reported in which properly administered fever therapy produced a loss of libido. Patients commonly carry on normal sex activity between their fever treatments. The fact that advancing age and neurosyphilis are both important causes of decreased sex power would seem to be sufficient explanation in this case.
The symptom of neuritis, for which the fever was administered, would suggest that the patient was showing an advance of the process prior to the hypertyrexia.

CHRONIC CYSTIC MASTITIS
To the Editor:—What form of glandular therapy is advocated for adenofibroma of the breast, diffuse and bilateral? This condition has been found in a woman aged 22. Can you tell me what she may expect should she become pregnant? Would the breast which seems to be entirely involved now start to function, or would the condition persist through pregnancy?
Thomas J. Murphy, M.D., Decatur, Ill.

ANSWER.—The diagnosis in this case is probably chronic cystic mastitis, or Schimmelbusch's disease. Generally no treatment is necessary because the only way to cure this condition is to remove the breasts. This surely is inadvisable for a 22 year old woman. In some cases during pregnancy the breasts enlarge considerably and hurt appreciably but in other instances only the physiologic enlargement and engorgement of the breasts take place. These breasts can function during the puerperium, that is secrete milk in spite of the disturbance.
Androgen may be tried. Testosterone propionate in doses of 10 to 25 mg. may be administered intramuscularly three times a week for four weeks. Sometimes there is relief from pain and some improvement in the condition of the breasts. Usually the relief is temporary and lasts only as long as treatment is carried out, but in some cases the relief persists even after all glandular treatment has been stopped.

NASAL SECRETION WHEN EATING
To the Editor:—A young man otherwise in good health complains of nasal secretion when eating and when exposed to cold weather. He is embarrassed over the necessity of using a handkerchief frequently. Advice in this problem will be appreciated.
M.D., Massachusetts.

ANSWER.—The symptoms described suggest the possibility of heat and cold sensitivity as a cause of the trouble. Cold sensitivity is more common than heat sensitivity as a cause of allergic symptoms. In many cases, however, this type of reaction to thermal changes is secondary to or associated with a true atopy to inhalants, foods or drugs. It would be advisable to investigate such a case completely from this point of view, including adequate tests for thermal sensitivity. Such tests will be found in any of the recent textbooks dealing with allergy.

ANTI-ANEMIC POTENCY OF LIVER AND AGE OF ANIMAL
To the Editor:—Is there any difference in the anti-anemic activity of the livers of young and adult animals? It would seem to me that the liver of adult animals that have had green fodder would be better for the patient than that of the milk fed young. I would appreciate this information, as the price of the two types of liver here is quite on economic factor with many people.
M.D., California.

ANSWER.—The anti-anemic activity of livers can be satisfactorily assayed only on patients with pernicious anemia and the errors of the method are considerable. No convincing reports have been found that the anti-anemic activity of the livers of young animals is superior to that of adult animals.

DIPHTHERIA IMMUNIZATION
To the Editor:—What kind of diphtheria inoculation is recommended for mass immunization of school children today? The literature is contradictory and confusing.
M.D., Montana.

ANSWER.—Three doses of plain diphtheria toxoid, 1 cc. each, injected subcutaneously three weeks apart is regarded as an efficient method for active immunization against diphtheria. Sometimes 0.5 cc. is given for the first dose.

Diphtheria toxoid, alum precipitated, in two doses of 1 cc. each injected subcutaneously with an interval of four weeks is given preference by some. Advantages in using this preparation are that (1) only two doses are injected and (2) in a certain proportion of individuals a single dose establishes immunity. Therefore if there is failure, for any reason, to complete the two dose treatment a number of those who received this first injection will probably be immunized. The alum tends to retard rapid absorption of the toxoid and consequently the antigenic response is more prolonged than when plain toxoid is administered.
The choice of procedure for mass protection of school children against diphtheria is usually determined by the department of health or the health officer.

SULFANILAMIDE FOR TYPHOID CARRIERS
To the Editor:—In Queries and Minor Notes (The Journal, Oct. 14, 1939, p. 1510) you discuss the use of sulfanilamide in the control of the typhoid carrier state and remark that the only reference in the literature up to this time seems to be the article of Bazin (Canad. M. A. J. 38:559 [June] 1938), who employed sulfanilamide for a biliary paratyphoid carrier. In view of the lack of published reports on the use of the drug in the typhoid carrier state, I should like to place on record the following observation:
The carrier studied was a woman aged 58, who in 1901 suffered on illness resembling typhoid, although it was not diagnosed as such at that time. From 1901 to 1936 she was at different times employed as cook, nursemaid and general housekeeper, and during this period at least three cases of typhoid are believed attributable to her. In 1936, on application for the position of cook in a large tuberculosis hospital, fecal specimens were secured from her, from which typhoid bacilli were cultured. Typhoid bacilli having also been demonstrated in specimens of bile aspirated from the duodenum, the carrier underwent cholecystectomy in 1936 in the hope of being cured of the carrier condition. The removal of a chronically inflamed gallbladder containing stones, and the appendix, both of which yielded typhoid bacilli on culture, failed to relieve the carrier condition. Subsequent positive cultures of duodenal contents, as well as feces, suggested that the infection was located in the biliary tract.
Through the courtesy of Dr. William S. McConnell, who undertook the medical supervision of the case, the carrier was admitted to the medical service of Strong Memorial Hospital, Rochester, N. Y., in March 1939 for treatment with sulfanilamide in an attempt to cure the carrier condition. The treatment and results are summarized in the accompanying table.

Observation Prior to, During and After the Administration of Sulfanilamide to a Chronic Biliary Typhoid Carrier

Date	Sulfanilamide Administered Orally, Gm.	Blood Level of Sulfanilamide, Mg. per 100 Cc.	Blood Studies			Cultures for B. Typhosus		Comment
			Red Cells, Mil-lions	Hemo-globin, Gm.	White Cells	Bile	Feces	
1936	..	....	....	....	....	+	+
1937	..	....	....	....	....	..	+
1938	..	....	....	....	....	..	+
3/ 6/39	..	....	4.36	12.6	7,930	..	+	Admitted to the hospital
3/ 8/39	..	....	....	....	....	..	+
3/ 9/39	..	....	....	....	....	..	+
3/10/39	8	....	....	....	....	..	+
3/11/39	8	....	....	12.8	8,550	..	+	
3/12/39	6	....	....	....	....	..	+
3/13/39	6	9.5	....	....	....	..	+
3/14/39	6	....	....	....	....	..	+
3/15/39	6	10.0	....	11.5	5,000	..	+	
3/16/39	5	....	....	....	....	..	+
3/17/39	5	....	....	....	....	..	+
3/18/39	..	7.3	....	13.0	5,500	+	+	
3/19/39	..	....	....	....	....	..	..	Maculopapular rash, left cheek
3/20/39	..	....	....	....	....	+	..	Discharged from hospital
5/ 8/39	..	....	....	....	....	..	+
5/ 9/39	..	....	....	....	....	..	+
5/10/39	..	....	....	....	....	..	+

The drug seems to have been tolerated well, the only untoward effect being the development of reddish maculopapular lesions on the left cheek March 19; these disappeared in a few days. The adequacy of the dosage may best be judged by reference to the sulfanilamide blood levels, which suggest that a concentration of approximately 10 mg. per hundred cubic centimeters was maintained for several days. The bacteriologic examinations show that typhoid bacilli did not disappear from the duodenal contents or feces during or following treatment with sulfanilamide. Perhaps other individuals might prove more responsive, or perhaps more intensive treatment with sulfanilamide would produce the desired effect. The typhoid carrier state is sufficiently important to carriers and to health officials to warrant continued research into the possibility of medical cure.
Paul A. Lembcke, M.D., Albany, N. Y.
Epidemiologist, New York State Department of Health.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examination of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, December 16, page 2261.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 826 Security Building, Phoenix.

ARKANSAS: *Basic Science*. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical*. Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Jan. 17. *Written examination*. Los Angeles, Feb. 26-29. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: *Endorsement*. Denver, Jan. 2. *Examination*. Denver, Jan. 3-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science*. New Haven, Feb. 10. Chairman, Dr. Charles M. Bakewell, State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical*. Hartford, March 12-13. Sec., Dr. T. P. Murdock, 147 W. Main St., Meriden. *Homeopathic*. Derby, March 12-13. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science*. Washington, April 22-23. *Medical*. Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, III State Capitol, Atlanta.

IDAHO: Boise, April 2. Dir., Bureau of Occupational Licenses, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 23-25. Acting Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science*. Des Moines, Jan. 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, State Department of Health, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science*. Minneapolis, Jan. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical*. Minneapolis, Jan. 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity*. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity*. Helena, April 1. *Examination*. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: *Basic Science*. Omaha, Jan. 9-10. *Applications must be on file not later than Dec. 26*. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination*. Carson City, Feb. 5. Sec., Dr. Frederick M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 29-Feb. 1. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 2-3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OREGON: *Basic Science*. Portland, Feb. 24. *Applications must be on file not later than Feb. 7*. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: *Written*. Philadelphia, Jan. 2-4. *Bedside*. Philadelphia, Jan. 5-6. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

PUERTO RICO: Santurce, March 5. Sec., Dr. O. Costa Mandry, Box 3854, Santurce.

RHODE ISLAND: Providence, Jan. 4-5. Sec., Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: June 20-22. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

WASHINGTON: *Basic Science*. Seattle, Jan. 11-12. *Medical*. Seattle, Jan. 15-17. Acting Dir., Mr. Dave S. Cohn, Olympia.

WISCONSIN: Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

WYOMING: Cheyenne, Feb. 5. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

Iowa June Examination

Mr. H. W. Grefe, director, Iowa State Board of Medical Examiners, reports the written examination held at Iowa City, June 6-8, 1939. The examination covered eight subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-seven candidates were examined, ninety-five of whom passed and two failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College.....	(1937) 79.6, 90.4,	(1939)*	84.3
State University of Iowa College of Medicine.....	(1938)	(1938)	77.9
	82.1, 84.3, (1939)* 77.9, 79.6, 80.3, 80.5, 80.8, 80.9, 81.3, 82, 82.3, 82.3, 82.3, 82.4, 82.4, 83.4, 83.6, 83.8, 84, 84, 84.1, 84.3, 84.6, 84.6, 84.6, 84.8, 84.8, 84.8, 85.1, 85.3, 85.3, 85.4, 85.5, 85.5, 85.5, 85.8, 85.9, 85.9, 85.9, 85.9, 86, 86.1, 86.3, 86.4, 86.6, 86.6, 86.8, 86.8, 87, 87, 87.1, 87.4, 87.4, 87.4, 87.5, 87.5, 87.8, 87.9, 88.1, 88.1, 88.1, 88.4, 88.4, 88.4, 88.5, 88.6, 88.9, 89.1, 89.1, 89.3, 89.4, 89.8, 89.8, 89.9, 89.9, 90, 90.3, 90.3, 90.3, 90.4, 90.4, 91.5, 91.6, 91.9		92.8
Creighton University School of Medicine..	(1937) 89.1,	(1938)	81.4
Medizinische Fakultät der Universität Wien..	(1917)* 77,	(1935)	81.4

School	FAILED	Year Grad.	Number Failed
State University of Iowa College of Medicine.....	(1939)		1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1936)		1

* Licenses withheld pending completion of internship.

New Mexico Endorsement Report

Dr. Le Grand Ward, secretary, New Mexico Board of Medical Examiners, reports twenty-six physicians licensed by endorsement October 10. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....	(1939) N. B. M. Ex.		New York
Stanford University School of Medicine.....	(1936)		California
University of California Medical School.....	(1922)		California
University of Colorado School of Medicine.....	(1911)		Colorado
(1938) N. B. M. Ex.			
Yale University School of Medicine.....			New York
George Washington University.....			Maryland
Northwestern University.....			Colorado
Rush Medical College.....			New York
State University of Iowa.....			Iowa
University of Kansas.....			Kansas
University of Louisville Medical.....			Oklahoma
Washington University School of Medicine.....			New York
University of Nebraska College of Medicine.....			Nebraska
University of Oklahoma School of Medicine..	(1931), (1933)		Oklahoma
Jefferson Medical College of Philadelphia.....	(1918)		Penn.
Baylor Univ. College of Medicine.....	(1930), (1937), (1938)		Texas
University of Texas School of Medicine.....	(1927), (1937), (1938)		Texas
University of Bristol Faculty of Medicine.....	(1934)		New Jersey
Université de Genève Faculté de Médecine.....	(1935)		New York

Tennessee September Examination

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held at Memphis, Sept. 27-28, 1939. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-one candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Wayne University College of Medicine.....	(1939)		87.5
St. Louis University School of Medicine.....	(1939)		87.1
University of Tennessee College of Medicine.....	(1939)		82.1, 82.9, 83, 83.3, 83.6, 83.8, 84.1, 84.4, 84.6, 85.3, 85.9, 86, 86.4, 86.8, 86.8, 87.4, 89.3, 90.1

Colorado October Examination

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination held at Denver, Oct. 4-6, 1939. The examination covered eight subjects and included sixty questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College.....	(1938) 84.5,	(1939) 85,	87
Osteopaths	75, 77, 78, 78.5,	80, 81,	82

* Licensed to practice medicine and surgery.

Book Notices

Pulmonary Tuberculosis in Adults and Children. By James Alexander Miller, A.M., M.D., D.P.H., Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University, New York, and Arvid Wallgren, M.D., Head of the Children's Hospital, Gothenburg, Sweden. 10th. Price, \$3.50. Pp. 193, with illustrations. New York & Edinburgh: Thomas Nelson & Sons, 1939.

As pointed out in both prefaces of this book, the work is a "fusion" of two monographs, each of which was prepared for a current system of medicine. Naturally, there are imperfections in such an artificial union. Repetitious statements, slight incongruities and lack of liaison are therefore more or less unavoidable, irrespective of the recognized ability and standing of both authors. Perhaps the most important incongruity is that the "cart is before the horse" when the "adult part" is placed ahead of that devoted to "tuberculosis of childhood."

Taking up Dr. Wallgren's part first (the logical order) there is little to say in a way of criticism and much to praise in the clinical field. It represents largely an essence of his own numerous studies. With regard to morbidity he tends to emphasize his own observations—an incidence of about 80 per cent infection by 20 years of age—but does not mention the fact that certain sections of the world have a much lower incidence. The mortality is highest in the first year (5 per thousand) and decreases to 2 per thousand for the second year and then less and less each year until between 9 and 12 years it is 0.5 per thousand with a slight rise again in puberty. The type of micro-organism, the modes and routes of infection, and portals of entry are described correctly and clearly. A point not commonly appreciated is that an incubation period exists from three to nine weeks, with a majority between four and six weeks. A conservative position is taken with regard to the relation of allergy and immunity. Although they are usually linked together, "tuberculin sensitivity is not in all cases a proof of the existence of immunity and the absence of tuberculin sensitivity is not in all cases evidence of the absence of a specific acquired immunity." He is emphatic with regard to the protection afforded by an infection to subsequent superinfections and reinfections.

The tuberculin reaction (with methods and types) is well covered. The author points out that a positive reaction represents the presence of an infection and that the reaction may diminish or disappear in malignant forms of the disease, in certain associated diseases, during the incubation period of primary tuberculous infection and on rare occasions when no cause can be found.

In the primary infection attention is directed to an important feature, the "initial fever" beginning at the appearance of allergy and lasting one or two weeks. It may rise to from 39 to 40 C. (102.2 to 104 F.). While other workers claim only about 30 per cent of such "invasion fevers," he finds it more frequently.

Erythema nodosum is considered as a nonspecific effect of tuberculosis (and more rarely other conditions) but the fever that accompanies erythema nodosum is like the fever that usually follows the primary tuberculous infection. When fever is present under such circumstances, it is a part of the initial fever.

Other symptoms of first infection are drowsiness, fatigue, headache, expiratory stridor and "bilateral cough." The latter is usually due to pressure of lymph nodes on bronchi. The patients usually lose appetite and weight and become anemic. There is almost a complete absence of physical signs and almost a universal presence of x-ray shadows of lesions either in the parenchyma or in the lymph nodes. The sedimentation reaction is recommended as a sensitive indicator to control progress. Bacilli are found in the stomach contents of 78.6 per cent of infants and about 50 per cent of older children having tuberculosis, and the more recent the infection the higher the percentage of bacilli. The lesions begin as a nonspecific pneumonia, then a specific infiltration, and then encapsulation, caseation and calcification follow in turn. Calcification begins at about a year and continues for many years. The lesion gradually shrinks for many years, some lesions disappearing altogether.

The Ranke classification of tuberculosis according to three stages (which both authors have adopted), although it has many attractive features, is not accepted by everybody and is not used by the Diagnostic Standards Committee of the National Tuberculosis Association.

For the first stage of Ranke with the primary complex and secondary hematogenous dissemination, most pathologists will agree. But when the "secondary tuberculosis" following the primary is placed in the same category with a late miliary tuberculosis or "protracted multiform miliary tuberculosis" or following an "exogenous infection" it doesn't make for simplification—the only real motive for the use of such a classification in the absence of the real facts. There are many controversial points. In the last analysis it resolves itself into a question of whether the lesions are encapsulated (secondary) or become open (tertiary) into some of the bronchial, gastrointestinal or urinary channels. Thus far, however, there is no anatomic basis for distinguishing between the two, outside of a communication or lack of it, with the exterior through these main channels. It is an attempt to explain too many phenomena by one method of classification. There hasn't yet appeared a logical system or classification that will adequately explain all immunologic and pathologic phenomena at one time, let alone the attendant clinical phenomena.

The author's handling of diagnosis, prognosis and treatment reveals the touch of one who knows his field. He recommends rest treatment during the fever stage and until the sedimentation becomes normal. It is usually from four to six weeks after the fever has subsided. The child should then be allowed up for short intervals and gradually return to normal and school work; all the while the temperature and sedimentation rate are watched. The question of hospitalization is not only medical but also a social problem. Primary tuberculosis does not necessarily need hospitalization, but if the home conditions are poor it is indicated. Children who have benign lesions without cough may be treated as noninfectious. Children with ulcerative lesions should be treated as any other patient with open tuberculosis.

Dr. Miller's part of the book is well presented as to the text, but the reproductions of pathologic conditions are indistinct and many of the x-ray reproductions do not show the changes at all. Furthermore, they do not harmonize with those in the second part. Both should have been either positive or negative. The paragraphs on infection, allergy, immunity, pathogenesis and prevention are well done, but there is no need for two different descriptions under one cover, with varying emphasis here and there but in general paralleling each other.

The development of an immunity as a result of allergy is rationally presented as well as the dangers of a hyperallergy with large dosage. The attempt to visualize the disease as an evolutionary pathogenic process is also to be commended, but as with Dr. Wallgren's part there is a question whether the classification of tuberculosis into three stages is as simple as it is intended to be.

The tendency to reject the term "reinfection type" in the sense that an exogenous reinfection is more important than an endogenous progression is justified, but there does not seem to be any need for calling it "second and third stages."

From a clinical standpoint the three groups primary, pre-phthisical and phthisical is a firm step in an attempt to correlate pathologic, x-ray and clinical observations and is perhaps better than any grouping yet proposed, although not free from objections.

The rest of the work is about as well presented as could be condensed into such a chapter in a system of medicine. The symptoms, modern methods of following subclinical phases (red cell sedimentation, leukocytic index, stomach lavage) are down to date. The physical manifestations, clinical course, diagnosis, differential diagnosis, complications, prognosis and treatment are all drawn along a modernization of classic concepts in an excellent manner. The author points out the limitations of physical examination and the importance of the x-rays, but unfortunately does not give all the important features of x-ray appearance of early lesions, nor does he show many simple lesions so important for beginners. This is more or less excusable, however, because of a lack of space. The surgical methods are brief but well presented. The part on prevention, overlapping considerably with Dr. Wallgren's part, includes education, pasteurization of milk, clinics, preventoriums, public health nursing, hospitals, sanatoriums, surveys, rehabilitation centers and vaccination. Lastly there is emphasized the important fact that the general practitioner is in the driver's seat in finding

tuberculosis and should be made to realize his importance and at the same time be instructed in the modern means of case finding.

In spite of the imperfections, this "hybrid" textbook possesses genuine value, is interesting and easy to read, and is perhaps as good as any similar work in the English language today. It is especially to be recommended for students of tuberculosis.

Atlas clinique d'ophtalmoscopie photographique: Syndromes cliniques du fond de l'œil. (Clinical Atlas of Fundus Photographies.) Par Henri Thilé, médecin-chef du laboratoire d'ophtalmologie, et A. Couadon, correspondant national de la Société d'ophtalmologie de Paris. Cloth. Price, 280 francs. Pp. 193, with 202 illustrations. Paris: Masson & Cie 1933.

For the past ten years the authors have been collecting photographs of the fundus of the eye. From their collection of 2,000, 202 were selected for publication. The preface, written by Mawas, fails to give credit to many of those most actively engaged in the field of fundus photography. This volume, the third photographic atlas to be published in the world, must necessarily be subjected to comparison with the previous two, the one by Dimmer and Pillat and the other by Bedell. In the former the reproductions are excellent and show no disfiguring arc image, while the second consists of the actual photographs and includes a great number of stereoscopic illustrations with the arc image. In the atlas under discussion there are black carbon spots. Some of these are so small as to suggest artefacts. The volume is logically arranged into the normal fundi, traumatic changes in the choroid, retina and optic nerve, inflammations of the optic nerve, inflammatory changes in the choroid and retina, congenital alterations, degenerations of the retina, degenerations of the macular area, changes in myopia, separation of the retina, hypertensive disease, diabetic changes, detachment of the retina, angioid streaks, blood states, cyanosis, intracranial pressure and tumors. The concise clinical descriptions aid the student in appreciating the fundus changes; in fact, without them diagnosis would often be impossible, for the authors write into the pictures things that are not in the prints. Several of the illustrations are noteworthy. These include some macular changes, especially the one called gliosis, myopic fundi, retinal folds, albuminuric retinitis, diabetic retinitis, and that which the authors call "stase papillaire," commonly referred to in English literature as papilledema, or choked disk. Attention is especially drawn to the illustrations of von Hippel's disease, which are among the finest ever published. The volume reflects credit on the authors for their technical skill, their selection of cases and the beautiful way in which these have been presented. It is recommended to all students of clinical ophthalmoscopy, for, although it is written in French, an English diagnosis is printed beneath each picture. The publishers have used clean type and a high grade of paper.

Arbeit und Gesundheit: Sozialmedizinische Schriftenreihe aus dem Gebiete des Reichsarbeitsministeriums. Herausgegeben von Professor Dr. Martineck, Ministerialdirigent im Reichsarbeitsministerium. Heft 36: Die Endangitis obliterans. Von Dr. Hans Karl von Hasselbach, Oberarzt der Chirurgischen Universitätsklinik München. Paper. Price, 6.70 marks. Pp. 168, with one illustration. Leipzig: Georg Thieme, 1933.

This monograph on Buerger's disease is interesting for the American reader for two reasons. In the first place it contains an excellent review of the literature on the subject, although obviously the English and American papers must have been read in abstract because their subject matter is often misquoted. Second, it contains for the first time an attempt to evaluate service connected disability on the basis of 193 cases, the files of which the author received from the Military Compensation Board. The difficulties of passing judgment in cases which the author did not have an opportunity to examine are obvious. Nevertheless, interesting case histories are presented. In the opinion of the author, prolonged exposure to cold or trauma may act as sensitizing factors for a person whose vascular tree is already hypersensitive to injury. With this working hypothesis in mind he presents a vague and indecisive outline as to how to evaluate disability from Buerger's disease in its relation to military service. He acknowledges liability if the disease occurs for the first time during active service or shortly after the completion of active service, including all late sequelae and recurrences. Nothing new is offered in the line of treatment. If anything the monograph depicts our present ignorance of the etiology and logical treatment of the disease.

Public Speaking for Technical Men. By S. Marion Tucker. Cloth. Price, \$3. Pp. 397. New York & London: McGraw-Hill Book Company, Inc., 1933.

Now that there are innumerable scientific societies in every branch of scientific learning which hold regular meetings at which topics are freely discussed, it becomes almost incumbent on the scientist who wishes to make progress in his field to be able to present his work suitably to his colleagues, to defend his thesis in open discussion—in a word, to understand how to influence people. This does not depreciate in any way the scientific value of his work; it merely recognizes the fact that elucidation is necessary for comprehension.

There are, however, many aspects in a scientific presentation which are quite separate from presentation before other bodies. The book by S. Marion Tucker gives a great deal of useful information and advice but unfortunately includes a mass of irrelevant data planned primarily to make the book readable. There is much discussion on the proper use of the voice, on the appearance on the public platform, on the use of vocabulary, on a study of the audience and on similar topics. Because of the technic of presentation of this book it is twice too long, much too long indeed for the amount of time that the average scientist would be willing to give to a work of this character. In certain aspects of the subject there is some doubt as to the author's capacity to recommend. This applies particularly to the use of humor. There are few, if any, occasions when humor is needed before a technical audience by a technical speaker. If there is such an occasion, it must be quite spontaneous and apropos. The story of "Pat and Mike" for the purpose simply will not do. There is no audience that can be so coldly silent and disapproving as a technical audience which happens to feel that the speaker is not taking with sufficient seriousness the problem of the day.

Gynecologic Operations and Their Topographic-Anatomic Fundamentals. By Prof. Dr. Med. Heinrich Martius, Director of the University Women's Clinic, Göttingen. Authorized English translation under the editorial supervision of W. A. Newman Dorland, A.M., M.D., F.A.C.S., Diplomate of the American Board of Obstetrics and Gynecology. Cloth. Price, \$10. Pp. 486, with 404 illustrations. Chicago: S. B. Debour, Publishers, 1933.

This is an English translation of what has been considered the best book of its type. In translating Martius into English, nothing has been lost, the text having become more understandable for the average American. The drawings, diagrams, anatomic sketches and technical details are exactly the same as in the German original, with nothing having been omitted. A study of this book will make one familiar with the surgical anatomy, relations and technic for all gynecologic procedures. The operative work is described from the incision of the skin to closure. Particularly interesting is the study of the operations for repair of relaxations of the urethral sphincter and for the repairs of fistulas. All in all, this is the best textbook of gynecologic surgical technic that it has been the fortune of the reviewer to study. It is a book that should be in the hands of all serious students of gynecology as well as the occasional pelvic operator.

The Treatment of Rheumatism in General Practice. By W. S. C. Copeman, M.A., M.D., B.Ch., Physician in Charge, Dept. of Chronic Rheumatic Diseases, West London Hospital, London. Third edition. Cloth. Price, \$4. Pp. 276. Baltimore: William Wood & Company, 1932.

A chapter on gout, one on focal sepsis and details of new methods of treatment have been added to this edition. The reviewer, however, is unable to share the enthusiasm expressed by others for the book. It is notably lacking in that critical discrimination between modes of treatment which is so highly desirable at the present time. A considerable number of proprietary remedies is recommended, some of them fortunately practically unknown in this country, including Kia-uma, Amysal, Balmosa, Aspirodine, Alasil and Kalmopyrin. A chapter is devoted to colonic therapy, with no new evidence added as to its efficacy, if any. There is also a chapter on osteopathy as "nature cures" in which, as in previous editions, osteopathy is far too favorably considered. The author would do well to consult the report of the select committee of the house of lords on the Osteopaths Bill in 1935 in his own country. Although there is a definite need for a volume on therapy for the general practitioner, the hope that this one would be developed along sound lines has not been fulfilled.

Les occlusions artérielles aiguës des membres: Formes cliniques, indications, physiopathologiques et thérapeutiques. Par H. Halmovici, assistant à la Faculté de médecine de Marseille, Marseille. Préface du Pr J. Floucl. Paper. Price, 26 francs. Pp. 124. Paris: Masson & Cie, 1939.

As one of a group of surgical and medical monographs written as a review and instruction for the general practitioner, the author describes the acute arterial occlusions in general, the perversions of physiology, the symptoms, various clinical forms, the diagnosis, prognosis and treatment. This review is entirely up to date and its main conclusions can only be reemphasized; namely, the difficulty of differentiation between arterial embolism and thrombosis; the utmost urgency in the treatment of arterial occlusion; the transportation of all such cases to surgical centers, where experienced surgical help can be secured; the place of antispasmodics, procaine hydrochloride block, sympathectomy, embolectomy, arteriectomy and amputation in the various stages of arterial embolism. The presentation is brief, concise and quite didactic. The American reader would welcome a few illustrations and case reports. The teaching value of this monograph to students and the general practitioner is unquestionable.

The Natural History of Population. By Raymond Pearl. University of London Heath Clark Lectures 1937. Delivered at the London School of Hygiene and Tropical Medicine. Cloth. Price, \$3.50. Pp. 416, with 40 illustrations. New York: Oxford University Press, 1939.

In this book the author has collected and summarized the results of his studies of human reproduction and fertility as gathered over a long period of years, and their apparent effects on world population. Altogether the factual data are impressive, but the author also has not hesitated to express his personal views of the significance and implications of the observed facts. Regardless of the ultimate corroboration or disproval of Pearl's excursions into speculation, the facts presented alone are of great importance. This book may be considered as required reading for those who wish to speak authoritatively on problems of human reproductivity and population trends.

Maternal Care and Some Complications: The Principles of Antepartum, Intrapartum, and Postpartum Care and of the Management of Some Serious Complications. Approved by the American Committee on Maternal Welfare, Inc. Prepared by W. C. Dantworth, M.D., et al. F. L. Adair, M.D., editor. Cloth. Price, \$1.50. Pp. 194. Chicago, Illinois: University of Chicago Press, 1939.

This book is a combination of two books previously published under the names "Maternal Care" and "Maternal Care Complications." These books have been reviewed in *THE JOURNAL* (Oct. 16, 1937, p. 1301, and Oct. 1, 1938, p. 1322). It is worth emphasizing that if most general practitioners of this country would acquaint themselves with the contents of this book there would be a marked improvement in antepartum, intrapartum and postpartum care, with a consequent sudden and dramatic decrease in the maternal and fetal mortality and morbidity.

Diseases of the Ear, Nose and Throat: Principles and Practice of Otorhinolaryngology. By Francis L. Lederer, B.Sc., M.D., F.A.C.S., Professor and Head of the Department of Laryngology, Rhinology and Otology, University of Illinois College of Medicine, Chicago. Second edition. Cloth. Price, \$10. Pp. 840, with 781 illustrations. Philadelphia: F. A. Davis Company, 1939.

The first edition of this volume appeared last year. Now appears a revised edition with numerous corrections and additions, particularly in the field of anatomy and in the illustrative material. The work continues to be an exceedingly practical and useful volume, especially for medical students.

Nutrition and Diet in Health and Disease. By James S. McLester, M.D., Professor of Medicine, University of Alabama, Birmingham. Third edition. Cloth. Price, \$8. Pp. 838. Philadelphia & London: W. B. Saunders Company, 1939.

This is the third edition of the book, which appeared first in 1927 and was reprinted in 1931. The present volume has been entirely rewritten and newly printed. An occasional paragraph from the earlier editions has been retained. The present volume places most of its emphasis on physiology. There have been added a chapter on the feeding of infants written by Dr. P. C. Jeans and one on feeding of the surgical patient by Dr. Deau Lewis. Here is a scientific and practical work on nutrition, discussing each of the dietary constituents fully, concerning necessary normal nutrition, and finally devoting a chapter to the

various nutritional diseases as they affect special organs or systems of the body. A large appendix provides tabular data quite complete. In the individual chapters there are numerous menus and other information of great practical value in the development of dietary advice in the practice of medicine.

Attaining Womanhood: A Doctor Talks to Girls About Sex. By George W. Corner, M.D., Professor of Anatomy, The University of Rochester School of Medicine and Dentistry, Rochester, N. Y. Cloth. Price, \$1. Pp. 92, with 15 illustrations. New York & London: Harper & Brothers, 1939.

This is a companion volume to the author's book entitled "Attaining Manhood," recently published. It provides a brief discussion of the human reproductive system and the reproductive cycle, followed by considerations of sex attraction and sex conduct. It is a book which will be found somewhat advanced for younger girls but which will, at the same time, be exceedingly useful for parents who wish to discuss these matters suitably with their children.

A List of Schools of Nursing Meeting Minimum Requirements Set by Law in the Various States. [Correct to January 1, 1939.] Paper. Price, \$1.75. Pp. 34. New York: National League of Nursing Education, 1939.

This is the first complete list of schools which has been published since 1935. It includes most of the information about individual schools which appeared in the previous edition and contains also data about the type of hospital in which the school is located and other pertinent items concerning the work of the school.

Diseases of the Foot. By Emil D. W. Hauser, M.S., M.D., Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School, Chicago. With a foreword by Sumner L. Koch, M.D. Cloth. Price, \$8. Pp. 472, with 263 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

This book on the foot is mostly concerned with the practical aspects of the care of the feet, including hygiene as well as the various diseases and deformities from which human beings suffer. The illustrations, which are numerous, add greatly to the value of the text, which is simple and direct. The author reflects here considerable experience both in this country and abroad, covering more than 2,000 cases seen in the author's private practice. While the volume is entitled "Diseases of the Foot," it is concerned equally with fractures and dislocations involving the foot and ankle. The work is one of the best monographs available on the subject with which it is concerned.

Diseases of the Skin. By Richard L. Sutton, M.D., Sc.D., LL.D., Professor of Dermatology, University of Kansas School of Medicine, Kansas City, and Richard L. Sutton Jr., A.M., M.D., L.R.C.P., Associate in Dermatology, University of Kansas School of Medicine. Tenth edition. Cloth. Price, \$15. Pp. 1549, with 1473 illustrations. St. Louis: C. V. Mosby Company, 1939.

The tenth edition of Sutton's well established textbook appears four years after the previous edition. The progress in dermatology in the intervening period has been considerable. Not only from the point of view of description of new entities but also from the establishment of new concepts, the various chapters of the book appear to include these discoveries. Moreover, there are ten color plates and 340 new illustrations. The authors point out that there have been a 100 per cent increment in the number of words and at least 7,000 bibliographic entries since the ninth edition. The book is marked by the authors' own opinions and observations. There are an excellent chapter on serologic diagnosis of syphilis and new material on the identification of the fungi. In their work the authors have consulted many other leaders in the field, so that this volume now constitutes one of the most timely, dependable works in the field that it concerns.

La recherche de la paternité par les groupes sanguins: Étude technique et juridique. Par Louis Christiaens. Préface du Pr Leclercq. Paper. Price, 26 francs. Pp. 108. Paris: Masson & Cie, 1939.

As the title indicates, this small volume is not another presentation covering the entire field of blood groups and other individual blood differences but is concerned principally with the application of blood tests for disputed parentage. Emphasis is placed on the legal aspects in civil and criminal court actions and on the standing of the matter in various countries, statistics being given on the number of court trials in which blood tests were introduced as evidence. Of interest is the discussion of

the possibility of applying Schiff's discovery that the appearance of group specific substances in secretions is governed by a single pair of genes. Also the tabulation of special cases in which conclusions can be drawn as to a child's parentage from the examination of the grandparents deserves mentioning. The book will serve less as a guide to medicolegal experts than to physicians and members of the legal profession, for whom it will provide informative reading. A few obvious errors in the formulas of table VII (lines 1 and 3), table IX (line 1) and in the last line of table X should be corrected.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Pharmacists: Liability for Substitution in Compounding Prescription.—In May 1936, in the course of treatment in the Wisconsin General Hospital at Madison, the plaintiff was found to be allergic to mercury. On a form that bore the name of the hospital, he was given a prescription reading as follows: "Calamine Lotion c Phenol (1%) Quantity as desired. Sig. Apply as directed." Six months later the defendant's wife had this prescription filled at a store kept by the defendant at Spooner, Wis. The defendant did not dispense the lotion prescribed but without notice to the wife substituted for it a commercial compound marketed as calazine lotion. He knew that calazine lotion contained mercury, but he did not know that it was to be used on a patient allergic to mercury.

When the lotion dispensed by the pharmacist was applied to the patient, new areas of inflammation appeared. The patient's family physician was thereupon consulted. Apparently he knew that the patient was allergic to mercury or was informed of it at that time, for he inquired of the defendant pharmacist whether the compound dispensed by him contained mercury. The pharmacist replied that it did not. On advice of the patient's family physician a more liberal application of the lotion was made. The defendant druggist, however, got word to the patient's physician later that the lotion did contain mercury but not in time to prevent the application that the physician had recommended. Such of it as had been applied was removed as speedily as possible, but the patient's body was blistered and for two months he was unable to wear clothing. He thereupon brought this suit, alleging negligence on the part of the defendant.

Instead of being called on to render a general verdict as to whether the defendant pharmacist had or had not been negligent and to determine the extent, if any, to which the plaintiff had been damaged, the jury was required to render a special verdict, answering several questions of fact propounded to it, leaving the question of negligence to be determined by the court as a matter of law on the basis of the jury's answers. The jury found from the evidence that the defendant pharmacist had failed to use proper care in filling the prescription and that the sickness and disability of the plaintiff was a natural and probable result of such negligence. It found, however, that the defendant could not reasonably have foreseen that injury or damage to the patient would probably follow from his failure to use proper care in filling the prescription. The plaintiff moved for a new trial.

The issue turned apparently on the finding of the jury that the defendant pharmacist could not reasonably have foreseen the injury or damage that would probably result from his failure to use proper care in filling the prescription. A negative answer by the jury to this question might be justified when only the filling of the prescription was concerned, said the trial court, but if it had considered that the plaintiff's family physician made specific inquiry of the defendant as to the presence of mercury in the lotion he had dispensed, it might have concluded that the defendant should have realized that the presence or absence of mercury was important. This matter, the trial court said, should have been submitted to the jury, either by way of question or by appropriate instruction, and this was not done. The court therefore granted a new trial and the defendant appealed to the Supreme Court of Wisconsin.

What the trial court said was held by the Supreme Court to justify fully the order for a new trial. It was clear that the defendant misrepresented a fact when he delivered to the plaintiff's wife a proprietary compound containing mercury, instead of calamine with phenol as described in the National Formulary. There was ample testimony that druggists are expected to fill prescriptions according to the National Formulary or the United States Pharmacopeia, unless the contrary is indicated. There was some testimony that variations from the standard formula were followed by local custom, but it was clear that if such a custom could ever be an excuse it was not so in the present case, for the prescription came from a distant hospital, where the prescribing physician could not be expected to know of local custom prevailing in the city where the prescription was filled. The patient's wife relied on the defendant's unspoken representation that the medicine dispensed was exactly what the physician at Madison had ordered. Later, when the defendant repeated the representation by telling the physician that there was no mercury in the lotion, she, as agent for her husband, the plaintiff, again relied on the truth of the representation. One who makes a representation of fact or law is liable for any bodily harm that results to another person from an act done by that other person, or by a third person, in reliance on the truth of the representation, if the person who makes that misrepresentation knows that his statement is false and intends to induce action, or should realize that it may induce action, by the other or by some third person which involves unreasonable risk of bodily harm. A pharmacist may have had reason to suppose that the medicine which he supplied was just as good as what the physician prescribed, but it must be held that the risk of harm from the substitution without informing the purchaser outweighs any possible utility that the substitution may have had. It is even more apparent that an unreasonable risk was involved in this case in misinforming the physician. In explanation of his falsely answering the inquiry made by the plaintiff's physician, the defendant pharmacist testified that he believed that it was his duty not to disclose to one physician the ingredients in a prescription written by another. The Supreme Court pointed out, however, that he could easily have refused to answer at all. Either of the defendant's acts, in the judgment of the Supreme Court, constituted actionable misrepresentation.

The circumstances of a pharmacist's calling demand the exercise of a high degree of care and skill, the highest degree consistent with the reasonable conduct of the business. The effect of a mistake may be swift and disastrous. There are many cases in which pharmacists have been held liable for injuries resulting from negligence in filling a prescription or supplying a remedy. In the present case the liability is more apparent than in most cases, because the substitution was deliberately made under the mistaken impression that the prescription could be changed in accordance with the pharmacist's judgment.

The order of the trial court granting a new trial was affirmed. —*Hoar v. Rasmussen (Wis.)*, 282 N. W. 652.

Society Proceedings

COMING MEETINGS

- American Academy of Orthopedic Surgeons, Boston, Jan. 21-25. Dr. Carl E. Badgley, 1313 East Ann St., Ann Arbor, Mich., Secretary.
- American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, Feb. 12-13. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otolological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Society of Surgeons of New Jersey, Camden, Jan. 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Western Section, American Laryngological, Rhinological and Otolological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

96: 255-516 (Sept.) 1939. Partial Index

- Cortical Spread of Epileptic Discharge and Conditioning Effect of Habitual Seizures. W. Penfield and E. Boldrey, Montreal.—p. 255.
- Study of Accidents in a Mental Hospital. C. A. Bonner and Lois E. Taylor, Hathorne, Mass.—p. 283.
- Review of Results of Pharmacologic Shock Therapy and Metrazol Convulsive Therapy in New York State. J. R. Ross, Wingdale, N. Y., and B. Malzberg, Albany, N. Y.—p. 297.
- Results and Observations on Insulin Shock Treatment of Schizophrenia. E. D. Bond, J. Hughes and J. A. Flaberty, Philadelphia.—p. 317.
- *Regarding Sodium Amytal as Prognostic Aid in Insulin and Metrazol Shock Therapy of Mental Patients (Dementia Praecox). M. M. Harris, W. A. Horwitz and E. A. Milch, New York.—p. 327.
- *Irreversible or Hyperglycemic Insulin Coma: Its Cause and Its Response to Blood Transfusion. J. Wortis and R. H. Lambert, Baltimore.—p. 335.
- Evaluation of Therapeutic Factors in Pharmacologic Shock. L. S. Lipschutz, R. W. Cavell, R. Leiser, E. N. Hinko and S. H. Rnskin, Eloise, Mich.—p. 347.
- Observations of Insulin Sensitivity. S. J. Tillim, Amityville, N. Y.—p. 361.
- Significance of Babinski Sign During Hypoglycemic Treatment of Schizophrenia. M. Heiman, Fulton, Mo.—p. 387.
- Central Nervous System Changes Produced by Insulin. K. E. Appel, B. J. Alpers, D. W. Hastings and J. Hughes, Philadelphia.—p. 397.
- Phantom Limb: Its Origin and Its Relationship to Hallucinations of Psychotic States. A. Gallinek, New York.—p. 413.

Sodium Amytal in Dementia Praecox.—According to Harris and his colleagues, in some earlier studies it was found that the intravenous injection of a freshly prepared 10 per cent solution of sodium amytal in preanarcotic doses produced transient ameliorating effects on some psychotic patients. Since such an ameliorating response indicated that the disturbed cerebral functions of these patients could be influenced favorably by a chemical agent, this reaction to the intravenous injection of sodium amytal was compared with the subsequent therapeutic effect of insulin hypoglycemic shock and metrazol convulsant therapy. The preanarcotic doses of sodium amytal were given fifty-five patients with dementia praecox prior to insulin hypoglycemic therapy. Thirty patients gave an ameliorating response to the sodium amytal and twenty-three of these a favorable response to insulin hypoglycemic treatment. The remaining twenty-five patients did not give an ameliorating response to sodium amytal and sixteen of these failed to respond to insulin treatment. The response to the sodium amytal test appears to be of prognostic value in insulin hypoglycemic shock therapy. Further studies are indicated.

Irreversible or Hyperglycemic Insulin Coma.—Wortis and Lambert point out that irreversible or hyperglycemic insulin coma presents a typical picture consisting of a sustained high blood sugar (following intravenous dextrose), fever, rapid pulse and respiration and frequently fits, vomiting or diarrhea. It is a serious complication occurring not only in shock treatment but no doubt in the management of diabetes as well. It may result in death or in permanent cerebral damage, but psychiatric persons who recover often show dramatic improvement in their mental state. Hyperglycemic coma is probably due to a therapeutic coma that has been prolonged beyond an hour or an hour and a half. Such prolongation is often unintentionally allowed, because the presence of gastric retention makes termination by tube feeding ineffective. As a practical consequence coma should generally not be allowed to last more than an hour or an hour and a half, especially when patients tend to rouse slowly, and sugar should be given intravenously to all those who do not begin to rouse fifteen or twenty minutes after tube feeding. In the authors' three cases of irreversible coma intravenous dextrose and the transfusion of 500 cc. of citrated blood

appeared effective. It would appear that the whole blood contains substances, other than oxygen or sugar, essential for cerebral metabolism, which have been destroyed or depleted by protracted coma. The dramatic psychiatric improvement in certain cases following prolonged coma suggests that if a safe method for such prolongation could be devised, it would further extend the value of shock treatment.

Annals of Internal Medicine, Lancaster, Pa.

13: 563-748 (Oct.) 1939

- Culture of Human Marrow: Studies of Effects of Roentgen Rays. E. E. Osgood and G. J. Bracher, Portland, Ore.—p. 563.
- *Sulfanilamide and Meningitis. S. W. Sappington and G. O. Favorite, Philadelphia.—p. 576.
- Five Years' Experience (1933-1937) with Mortality from Acute Coronary Occlusion in Philadelphia. O. F. Hedley, Philadelphia.—p. 598.
- Observations on Experimental and Clinical Use of Sulfapyridine: III. Mechanism of Recovery from Pneumococcal Pneumonia in Patients Treated with Sulfapyridine. W. B. Wood Jr. and P. H. Long, Baltimore.—p. 612.
- Observations on Toxicity and Clinical Value of Strophanthin. W. A. Brams, J. S. Golden, A. Sanders and L. Kaplan, Chicago.—p. 618.
- Choice of Ovarian or Pituitary Therapy for Menstrual Disturbances. E. L. Sevringshans, Madison, Wis.—p. 629.
- New Mathematical Method for Evaluation of Endogenous Insulin Secretion. M. M. Miller and O. P. Allen, Akron, Ohio.—p. 636.
- *Clinical Pictures Associated with Increased Blood Pressure: Study of 100 Patients. J. R. Williams Jr. and T. R. Harrison, Nashville, Tenn.—p. 650.
- Cutaneous Xanthomatosis. H. Montgomery, Rochester, Minn.—p. 671.
- Mechanism of Psychoneuroses. T. Klingmann, Ann Arbor, Mich.—p. 677.
- Plasma Lipoids in Arteriosclerosis Obliterans. N. W. Barker, Rochester, Minn.—p. 685.
- Mucosal Changes Accompanying Gastric Ulcer: Gastroscopic Study. R. Schindler, Chicago, and R. I. Baxmeier, Pittsburgh.—p. 693.
- *Neoprontosil (Oral) in Treatment of Chronic Ulcerative Colitis. A. E. Brown, W. E. Herrell and J. A. Bargen, Rochester, Minn.—p. 700.

Sulfanilamide and Meningitis.—Sappington and Favorite present twenty-two cases of various types of meningitis treated with sulfanilamide and review the 205 cases reported in the literature. The matter is viewed almost solely as a clinical experiment analogous to experimental work in animals in which the death or survival of the animal is the criterion of the success or failure of the therapy. This is feasible because of the almost certain fatal outcome of all forms of acute meningitis, so that recovery under sulfanilamide of any large group of cases may be reasonably attributed to the drug (except in meningococcal and gonococcal meningitis, in which recovery does occur at times and the therapeutic value of the drug must be correspondingly modified). No definite conclusions can be drawn as to the value of sulfanilamide in meningitis as an entity owing to the variation in results in the different types of meningeal infection. Final opinions cannot be given in most instances until more cases accumulate in the literature. However, it may be said that the value of sulfanilamide in beta hemolytic streptococcus meningitis has been established beyond dispute. A reduction of the mortality from 95 per cent and above to about 20 per cent speaks for itself. Infections due to *Streptococcus viridans*, the tubercle bacillus or the gonococcus treated with sulfanilamide are too few in number for appraisal. The results so far in influenzal meningeal infections are discouraging. In pneumococcal meningitis with its terrific mortality, the outcome, nine recoveries in thirty-nine cases, at least warrants further trial and seems to offer possibilities. There were eleven deaths in eighty-four cases of meningococcal meningitis, a mortality of only 13 per cent, which appears remarkable. However, Hoyme reports only a mortality of 16 per cent in serum treated cases, and as in many of the drug cases serum also was given, conclusions should be withheld. However, if results are equal, sulfanilamide seems preferable. The necessity for specific serums in addition to the drug, as suggested by experimental work, has yet to be proved. As satisfactory concentrations of the drug in the blood and spinal fluid are easily attained by the oral route, it might be better to do away with intrathecal treatment and avoid the possible irritating influence of spinal taps for drainage and injection purposes.

Increased Blood Pressure.—Williams and Harrison studied 100 patients with increased blood pressures. Persons displaying elevation of only the systolic pressure and individuals with acute or chronic glomerulonephritis have been excluded. Certain patients presenting unusual types of hypertension have been

deliberately included for illustrative purposes. All the patients have had complete histories and physical examinations, urinalyses, blood counts and determination of the nonprotein nitrogen of the blood, and other laboratory tests. After the observations of each patient had been summarized and tabulated an attempt was made to separate the cases into various syndromes. However, in the present state of inadequate knowledge such separation is not entirely justifiable. Although it has not been possible to distinguish with certainty between the underlying and the aggravating causes of hypertension, and although in many instances more than one factor has seemed to be of importance, most of the individuals have displayed one major condition which appeared to be the most significant cause of the increased blood pressure. By recognizing and treating the underlying and contributing factors much can be accomplished in the alleviation of the disorders which are characterized by hypertension. The authors' classification of hypertension into six groups is suggested as representing a working approach toward an etiologic concept of the disorder: 1. Hypertension of neurogenic origin may be due to psychogenic, medullary, increased intracranial pressure and reflex causes. 2. That due to endocrine causes can be initiated by pituitary, adrenal and ovarian disorders. 3. The causes of renal hypertension are acute and chronic glomerular nephritis, obstruction to urine flow, infection of the urinary tract, diseases of the renal arteries and renal tumors. 4. Hypercholesterolemia (renal atheroma) and gout (uric acid deposits in the kidneys) are causes of metabolic hypertension. 5. In this group the hypertension is brought about by congestive heart failure. 6. The sixth classification includes mixed and unclassified causes of hypertension. No attempt has been made to distinguish between underlying and aggravating causes of hypertension. Thus, glomerular nephritis is clearly an underlying cause, while mental stress and strain is in all probability an aggravating or precipitating cause. Many of the conditions which have been listed seem to produce hypertension only when they occur in predisposed subjects. However, until more is known about this question it seems wise to include in an etiologic classification all factors which seem to produce hypertension, even though they may not initiate the disorder but serve only to intensify it. It makes little difference whether a given condition is underlying or aggravating, provided treatment directed toward it will produce benefit.

Neoprontosil for Chronic Ulcerative Colitis.—Brown and his co-workers used neoprontosil (oral) for the treatment of forty-eight patients with chronic ulcerative colitis. For further evaluation of the drug twenty-nine of these patients were treated with neoprontosil alone (group A). The remaining nineteen were given serum or vaccine in conjunction with neoprontosil (group B). In 44.8 per cent of the patients in group A the clinical results were considered excellent, in 44.8 per cent the results were fair and failure of treatment or poor results occurred in only 10 per cent. Analysis indicates that in 42 per cent of the patients in group B the results were excellent, whereas in 32 per cent they were fair and the treatment failed or poor results occurred in 26 per cent of this group. The authors state that the clinical response to neoprontosil is not predictable on the basis of the amount of intestine involved by the disease so long as its destruction is not too great. Obviously, all that any drug can be expected to accomplish is the control of symptoms that are due to active infection; those symptoms which result from altered function of a deformed intestine must be expected to continue to cause disturbances. If neoprontosil is used early in the course of chronic ulcerative colitis it seems that the maximal effect from the drug will be obtained. The prompt improvement of these lesions which has occurred so frequently and uniformly after the use of neoprontosil, the authors believe, justifies the conclusion that the drug is of definite benefit in this disease. However, the tendency of the disease to recur must be appreciated fully. Therefore they continued to give intermittent courses of treatment even when the disease has been symptomatically and objectively inactive for some months. The lack of toxic manifestations associated with the use of neoprontosil in general makes it especially adaptable to the treatment of chronic ulcerative colitis.

Archives of Internal Medicine, Chicago

64: 897-1132 (Nov.) 1939

- Optimal Time for Administration of Protamine Zinc Insulin. M. F. Mark, New York.—p. 897.
- Deleterious Effects of Experimental Protamine Insulin Shock. J. W. Sherrill and E. M. MacKay, San Diego, Calif.—p. 907.
- Transport of Air Along Sheaths of Pulmonic Blood Vessels from Alveoli to Mediastinum: Clinical Implications. C. C. Macklin, London, Ont.—p. 913.
- *Studies on "Essential" Hypertension: I. Classification. H. A. Schroeder and J. M. Steele, New York.—p. 927.
- Shock. L. Meyler, Groningen, The Netherlands.—p. 952.
- Incidence of Fatal Cardiovascular Disease in Charleston, S. C., with Particular Reference to Hypertension. T. M. Peery, Washington, D. C., and S. M. Langsam, New York.—p. 971.
- Blood "Guanidine": Further Observations. R. H. Major, C. J. Weter and M. J. Rumold, Kansas City, Kan.—p. 988.
- Multiple Myeloma. H. Ulrich, Boston.—p. 994.
- Lipoeic and Fatty Infiltration of Liver in Pancreatic Diabetes. L. R. Dragstedt, C. Vermeulen, W. C. Goodpasture, P. B. Donovan and W. A. Geer, Chicago.—p. 1017.
- *Structural Changes in Lungs of Drug Addicts. G. C. Cole, New York.—p. 1039.
- Syphilis: Review of Recent Literature. J. E. Moore and C. F. Mohr, Baltimore.—p. 1053.

Classification of Essential Hypertension.—In an attempt to classify the contributing causes of essential hypertension, Schroeder and Steele review the 218 cases encountered at their hospital during the last ten years. At present ninety of the patients are dead, there is no information about eleven and 117 are living. Of the latter, 114 continue to be observed. All were referred as having typical "essential" hypertension and either exhibit or have exhibited elevation of diastolic pressure without failure of renal function. In most cases the time of the onset of hypertension is known within two years. Although essential hypertension has been regarded as a primary disease, the question is raised again whether it is not merely a syndrome common to a number of maladies. If so, some or all of the contributing mechanisms (renal disease, disorders of the nervous system, endocrine dysfunction and vascular disease) would be better understood if viewed in association with coexistent disturbances. The adoption of this attitude has been useful in understanding and in classifying cases in which hypertension has been considered essential and in which the underlying abnormal processes of the four systems set forth have been unsuspected. 1. Renal disease can be regarded as causally related to hypertension only in cases in which the diastolic pressure has fallen after a diseased kidney has been removed. Certain renal abnormalities seem to occasion hypertension, although they occur also in its absence. The condition is designated "renal hypertension with failure." In these patients a rapid course is not unusual (35 per cent), hemorrhagic and exudative lesions of the retina are common (65 per cent) and death from renal failure is often the outcome (76 per cent). 2. In the group suggesting derangement of certain functions of the nervous system (nervous hypertension) the arterial hypertension is benign. It occurs in younger persons and occasions few of the signs commonly associated with hypertension at this age. Changes in the retina, cardiac enlargement and failure of renal function are unusual. The lability of the blood pressure is noteworthy. The progress of the disease appears to be extremely slow even when the blood pressure is definitely elevated. The predominance of symptoms is of the nervous system. 3. It is still not clear whether dysfunction of the endocrines can be responsible for elevation of arterial pressure except in cases of pronounced endocrine dyscrasia (e. g., cases of Cushing's syndrome). However, endocrine dysfunction of less pronounced form is undoubtedly associated with essential hypertension in some cases, as it was present in 19 per cent of the authors' cases. They have called such a condition "endocrine hypertension." The patients in this category frequently complain of severe headache. In cases of "nongitrous thyrotoxic hypertension" the illness progresses rapidly, symptoms are severe, and hemorrhagic and exudative lesions are seen in the retina. If the hypertension begins at the menopause and after recovery from hyperthyroidism, it runs a benign course. While in ten of forty-three patients the course was consistent with the diagnosis of malignant hypertension, thirteen lived more than ten years. 4. Arterial hypertension is now believed to follow lesions of the blood vessels only when these lesions involve the arteries supplying the kidney. A constrictive mechanism of these arteries is believed to be operative when they are narrowed by arteriosclerosis. The course is usually benign (87 per cent),

arteriosclerosis of the vessels of the retina (but not retinitis) is common (97 per cent) and the terminal event is often apoplexy (64 per cent). Hypertension of this type is designated "arteriosclerotic hypertension." The authors believe that their study suggests that essential hypertension is not a primary disease. The fact that this diagnosis is made by exclusion should indicate multiple causes. Associated disturbances may be significant. A new classification is obvious. The present one cannot be regarded as more than tentative. However, it has been of advantage in facilitating diagnosis, in making prognosis more accurate and in indicating a more reasonable therapy. It is desirable that other means of differentiation be utilized to establish what is essential in this condition.

Structural Changes in Lungs of Drug Addicts.—During the last fifteen months Cole examined roentgenograms of the chest of 674 male drug addicts. In most instances they were taken after and in a few during the height of withdrawal symptoms. The status of the upper respiratory tract of 100 ambulatory drug addicts was determined. The investigation consisted of routine examinations of the sinuses by transillumination, and the sinuses of fifty were examined roentgenologically. The teeth, tonsils, pharynxes and nasal septums were inspected. In eighty other cases the changes were observed accidentally in the hospital after the development of acute illness. The 674 addicts were divided into two classes: those who entered the hospital voluntarily and those who were imprisoned for crimes not necessarily connected with the use of drugs. The youngest addict was 17 and the oldest 62 years of age; the average age was 39. The average duration of addiction was eighteen years, with a range from three months to thirty-nine years. Almost all the patients had taken more than one drug at some time. Heroin (diacetylmorphine) was the drug most commonly employed. Opium and its derivative morphine were next in order. Cocaine, contrary to popular conception, was used comparatively less than the others. Most of the drugs were taken subcutaneously. The addicts represented every stratum in the social scale. The withdrawal treatment, lasting six days, to which the addicts were subjected consisted of subcutaneous injections of progressively diminished quantities of morphine sulfate. The roentgenograms of the chest of only ninety-two of the 674 addicts, 13.5 per cent, were entirely normal. The commonest abnormality (207 cases) consisted of pulmonary changes characteristic of hypertrophic emphysema, i. e. voluminous lung fields, prominent hilar shadows, diffuse, increased vascular markings, obliteration of one or both costophrenic sinuses, and tenting and occasionally distortion of one or both diaphragmatic domes. Most of these patients used drugs for from fifteen to twenty years. Ninety-four patients merely showed signs of emphysema without generalized increase in pulmonary markings. Thirty-two addicts, according to whom there was only a short period of addiction, from three months to five years, showed increased markings with slight signs or no signs of emphysema. The remaining 249 addicts displayed, in addition to emphysema, some of the following changes: fibro-indurative tuberculosis of one or both apexes and occasionally of the subapical regions, minimal apical scarring, fibrocaceous pneumonic tuberculosis, calcified tuberculosis of one or both upper lobes, bronchiectasis, calcareous pleuritis (one case), interlobar effusion (one case) and emphysema bullosum (one case). About 30 per cent of the addicts with abnormal x-ray changes showed foci of infection of the upper part of the respiratory tract on routine physical examination. The author concurs with other workers that infections of the upper part of the respiratory tract play an important part in the production of structural changes in the lungs. However, in the 70 per cent of cases in which there were abnormal pulmonary changes but no apparent etiologic factor the age range itself (average 39 years) tends to explain these changes without an etiologic factor. Of the diseases which coexisted or developed during the period of incarceration, only tuberculosis is considered. Tuberculosis in all its forms constituted only 7 per cent. This is not without clinical significance. The experimental work of Brunelli and Luisida lends strong support to the conception that morphine sulfate when used in large doses over a prolonged period will produce definite structural pulmonary changes as well as alteration in the pulmonary circulation.

Archives of Surgery, Chicago

39: 691-900 (Nov.) 1939

- Etiology of Gallstones: Critical Survey of Literature and Study of Applicability of Various Theories in 239 Operative Cases.** R. F. Carter, C. H. Greene, J. R. Twiss and R. Hotz, New York.—p. 691.
- Treatment of Varicose Veins.** G. O. Dean and J. W. Dulin, Iowa City.—p. 711.
- Nerve Action Potentials in Experimental Traumatic Shock.** R. D. Cressman and E. W. Benz, Nashville, Tenn.—p. 720.
- Surgical Excision of Material for Biopsy in Lymphomatous Diseases.** J. S. Binkley, New York.—p. 728.
- Muscular and Skeletal Changes in Arachnodactyly.** J. J. Fahey, Chicago.—p. 741.
- Reactions of Peritoneum to Trauma and Infection: Further Experimental Studies.** F. A. Coller, H. K. Ransom and C. S. Rife, Ann Arbor, Mich.—p. 761.
- Stages in Peritonitis Based on Defense Mechanism in Relation to Treatment.** B. Steinberg, Toledo, Ohio.—p. 770.
- Peritonitis in Cats Produced by Intraperitoneal Injection of Bacillus Coli Suspended in Mucin.** G. P. Seley, New York.—p. 783.
- Tumor of Thalamus: Ventriculographic Entity.** O. R. Hyndman and C. Van Epps, Iowa City.—p. 792.
- Scoliosis Following Empyema.** S. Selig and E. Arnheim, New York.—p. 798.
- Multiple Myeloma: Review of Forty Cases.** M. Batts Jr., Ann Arbor, Mich.—p. 807.
- Causal Significance to Traumatic Ossification of Fibrocartilage in Tendon Insertions.** E. F. Hirsch and R. H. Morgan, Chicago.—p. 824.
- Review of Urologic Surgery.** A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Connor, Chicago.—p. 838.

Scoliosis Following Empyema.—Because it was thought that scoliosis occasionally followed operation for empyema, Selig and Arnheim studied the records of sixty-five patients with nontuberculous empyema who were operated on at the Mount Sinai Hospital during the years 1932 to 1936 inclusive. An explanation was sought why some patients had persistent scoliosis after empyema while others, with apparently similar involvement, recovered without any permanent spinal deformity. The sixty-five patients examined from one to six years after operation for empyema are unselected and represent one third of all those operated on and they are a representative sample. Five had clinical evidence of scoliosis, but the curve of only two was severe. Of these two patients with chronic empyema beginning at the ages of 11 and of 2½ the primary curves were respectively 97 and 44 degrees. The curvatures were of contrasting types; the first had its convexity on the side of an extensive rib resection (thoracoplasty scoliosis); the second was concave on the side of the empyema, a typical postempyemic curve. Of the three patients presenting slight curves, two began to have chronic empyema at the age of 12 and multiple short rib resections had been performed. When observed eighteen years later, both had high dorsal curves, of 17 and 12 degrees respectively, with the concavity on the side of the empyema and compensatory dorsolumbar curves in the opposite direction. The remaining patient, a boy, began to have the chronic empyema at the age of 4. A partial thoracoplasty was done at 10 and when he was observed four years after the operation there was a curve of 9 degrees with the convexity on the diseased side. An analysis of the sixty cases in which empyema was not followed by lasting scoliosis shows that persistent scoliosis did not occur in any of the fifty-two in which there was acute empyema (with onset between less than 1 and more than 20 years of age) and in which wounds healed permanently in the mean time of four months or less. In the eight in which chronic empyema was present, scoliosis did not develop despite multiple operations, rib resections and excisions of the soft parts, whereas in the five in which persistent scoliosis did develop it followed thoracoplasties or multiple rib resections. Therefore the reasons for the appearance or nonappearance of persistent scoliosis following chronic empyema are not apparent, though clearly it does not follow acute empyema.

Multiple Myeloma.—Batts reports that the incidence of multiple myeloma at the University Hospital is at variance with its incidence as reported by other sources. Life insurance tables give its incidence as 0.03 per cent of all malignant growths or 3 per cent of all sarcomas of bone. In the American Registry of Bone Tumors, in proportion to osteogenic sarcoma it is in the ratio of approximately 1:12, and to Ewing's sarcoma of approximately 1:3. Of the 200 primary malignant tumors of bone seen at the University Hospital since 1925, forty have been diagnosed as multiple myeloma, an incidence of 20 per cent. The

Johns Hopkins Hospital reports an incidence of only 3 per cent of 400 sarcomas of bone. The forty cases of multiple myeloma discussed by the author were encountered in 298,546 admissions to the hospital, a ratio of 1:7,464. The average age of the patients in the series was 53 years. Multiple myeloma occurs almost twice as frequently in men as in women. Etiologically it is not related to trauma. Its chief symptom is pain, which may occur in any location and is not characteristic except that there is usually a single period of remission. Palpable soft tumors are found in half of the patients, usually on the skull or on the trunk. Pathologic fractures are common. Deformities of the thoracic cage and of the spine are not unusual. Paraplegia and nerve involvement referable to the spinal cord are frequent complications. Multiple myeloma occurs most frequently in the skull, spine, ribs and pelvis, in this order. X-ray examination shows multiple punched-out areas of osseous destruction with no evidence of osseous reaction. Secondary anemia and, in half of the cases, Bence Jones protein in the urine are present. The lesions show masses of round cells that resemble plasma cells, with little or no intercellular substance. At necropsy in about half of the cases the soft tissues, particularly the liver, spleen and kidneys, are invaded by myeloma. Arteriosclerotic nephropathy is present in most cases. Roentgen therapy gives relief from pain and prolongs life. Laminectomy and decompression of the spinal cord are indicated in cases of paraplegia due to multiple myeloma. Multiple myeloma is invariably fatal. The average duration of life from the onset of symptoms of the disease until death is about two and one half years. The longest survival on record in a proved case is fourteen years and four months. The prognosis is more favorable for relatively young patients and for those with initial solitary involvement, which usually became multiple before death.

Endocrinology, Los Angeles

25: 661-844 (Nov.) 1939. Partial Index

- *Treatment of Hypogonadism in the Male with Gonadotropic Principle of Pregnant Mare's Serum. R. H. Kunstadter, Chicago.—p. 661.
- Comparison of Four Methods of Bio-Assay for Gonadotropic Factors. R. T. Frank and Rose L. Berman, New York.—p. 683.
- *Relief of Myxedema with Proteins of Extrathyroidal Origin. J. Lerman and W. T. Salter, Boston.—p. 712.
- Somatic Growth Depressing Effect of Testosterone Propionate. H. S. Rubinstein, A. A. Kurland and M. Goodwin, Baltimore.—p. 724.
- Responses of Female to Male Hormone Substances: Notes on Behavior of Hens and Newly Hatched Female Chicks. J. B. Hamilton and W. R. C. Golden, New Haven, Conn.—p. 737.
- Urinary Excretion of Estrogens, Androgens and Follicle Stimulating Hormone Following Administration of Testosterone to Human Female Castrates. F. T. Nathanson and Lois E. Towne, Boston.—p. 754.
- Influence of Anterior Pituitary Extracts on Proteins of Liver. O. B. Houchin, Columbia, Mo.—p. 759.
- Further Studies on Antagonist to Adrenalin Hyperglycemia in Pituitary Extracts. A. H. Neufeld and J. B. Collip, Montreal.—p. 775.
- Properties of Ovarian Extracts. H. W. Marlow, Manhattan, Kan.—p. 793.

Treatment of Male Hypogonadism with Mare's Serum.

—According to Kunstadter, it is now generally agreed that the anterior pituitary-like hormone from pregnancy urine and placenta are of definite value in the treatment of some types of hypogonadism and cryptorchidism. In view of the remarkable gonad stimulating properties of pregnant mare's serum (resembling in biologic effects those of the anterior lobe extract) in experimental and domestic animals and because of the convenient source of the hormone, it seemed justifiable to demonstrate the clinical effects of the hormone on patients with hypogonadism and cryptorchidism. Fourteen boys between the ages of 6½ and 14¼ years, who presented hypogonadism, cryptorchidism or both, were treated by the intramuscular administration of pregnant mare's serum. Definite improvement as evidenced by growth of the genitalia, the appearance of secondary sex characteristics or descent, partial or complete, of undescended testes occurred in eight, or 66½ per cent. Cryptorchidism was present in eleven of the fourteen patients, pseudocryptorchidism in four, and true cryptorchidism in seven. In the latter group complete descent of the testes occurred in one or both testes of three and partial descent in two patients. Two cryptorchids did not respond to treatment. There was no change in the distribution of fat or weight loss of any of the patients. It is believed that mare's serum is of definite value in the treatment of certain cases of hypogonadism and cryptorchidism. As yet the optimal effective dose has not been established, but the author believes

that from 50 to 100 rat units intramuscularly three times a week probably will be more effective than the 10 to 20 three times a week administered to his patients. With the higher dosage, results would probably be obtained in a shorter time.

Proteins of Extrathyroidal Origin in Myxedema.—Lerman and Salter say that the isolation of thyroxine by Kendall led to the conception that the prime function of the thyroid is the manufacture of this substance in toto. These studies, however, show that the simple incorporation of iodine into non-descript protein leads to thyroidal activity. When blood serum protein, in ammoniacal solution, is treated with compound solution of iodine according to the procedure of Wormald, within a short time there results an iodoprotein. The iodoprotein was administered to patients with athyreosis, and rapid and complete recovery occurred with proper dosage. Control patients who were given noniodinated serum protein showed no effect. In terms of total mass, the activity of the iodoprotein was about one fifth that of whole thyroid; in terms of iodine the activity was about one four hundredth. This discrepancy in activity is due partly to the presence of iodine in inert combination in the iodoprotein and in its derivatives. The low potency in terms of iodine is probably due also to the fact that the effective iodine-containing group is an iodothyronine derivative, which has lower potency than thyroxine. The iodinated protein can be fractionated by enzymes or alkaline hydrolysis into thyroxine-like (T) and into diiodotyrosine-like (D) fractions. The latter were inert; the former possessed all the activity present in the original iodoprotein. As with the enzymatic split products of thyroglobulin, the D fraction yielded no thyroxine-like amino acid after drastic treatment with hot barium hydroxide solution, whereas the T fraction yielded, under such treatment, material which resembled iodothyronine derivatives (related to thyroxine). The latter can likewise be recovered from the original iodoprotein by drastic alkaline hydrolysis without previous separation into component peptones. Such a procedure is the standard method for obtaining thyroxine from thyroglobulin. The observations reported here show that simple iodoprotein as well as its hydrolysates are effective in relieving human myxedema. This evidence that thyroidal activity can arise in a colloidal molecule through simple iodination throws some doubt on the prevailing concept that the thyroid gland manufactures thyroxine in toto and then builds it into a protein for storage. Perhaps in the iodinated colloid itself may be found the beginning of thyroidal activity.

Johns Hopkins Hospital Bulletin, Baltimore

65: 353-430 (Nov.) 1939

- Arteriosclerosis and Partial Obstruction of Main Renal Arteries in Association with "Essential" Hypertension in Man. S. S. Blackman Jr., Baltimore.—p. 353.
- *Four Cases of Gonococcal Endocarditis Treated with Sulfanilamide, with Recovery of One. P. H. Fletcher and V. C. Scott, Baltimore.—p. 377.
- Experimental Studies on Cultural Behavior and Infectivity of Lymphopathia Venereum Virus Maintained in Tissue Culture. G. O. Ger and F. B. Bang, Baltimore.—p. 393.
- Factors Influencing Plasma Prothrombin in Newborn Infant: II. Antepartum and Neonatal Ingestion of Vitamin K Concentrate. L. B. Shettles, Eleanor Delfs and L. M. Hellman, Baltimore.—p. 419.

Sulfanilamide in Gonococcal Endocarditis.—Fletcher and Scott state that four patients at the Johns Hopkins Hospital with gonococcal endocarditis received a seemingly adequate course of treatment with sulfanilamide. Three of them died and the diagnosis was subsequently corroborated at necropsy; the fourth patient recovered. After presenting detailed histories, the authors point out that the patient who recovered from her illness does not completely fulfil the most rigid criteria for establishing the presence of bacterial endocarditis. The regularity of the temperature curve, the cardiac symptoms in the presence of a positive blood culture and the nephritis make it seem likely that she suffered from a gonococcal endocarditis, probably involving the pulmonic valve. However, in view of the previous history of dyspnea on exertion, it is impossible to exclude the possibility that the patient may have had either a long-standing rheumatic lesion of the aortic valve or a patent ductus arteriosus, to explain the precordial murmurs, and that the present illness was merely a bacteremia without acute endocardial involvement. It is of interest that the patient showed two peaks of fever daily, a symptom noted by Horder and recently emphasized by Williams and Fletcher as common in

gonococcal endocarditis. Further, she showed the jaundice reported as complicating the latter disease. Finally, the patient had diffuse glomerular nephritis, which is frequently associated with gonococcal endocarditis. In evaluating the role of sulfanilamide in the improvement of this case, it should be recalled that recovery from proved gonococcal endocarditis itself has occurred following supportive therapy alone. The three patients who died despite treatment with sulfanilamide all received the drug more or less continuously for periods of from seven to fifty-four days. Blood levels of unacetylated sulfanilamide of 10 mg. or more per hundred cubic centimeters were attained, though not always constantly maintained, by each of the three patients. One of the patients died following a hemiplegia presumably due to a cerebral embolus. Another succumbed to myocardial failure apparently due to the hypertension accompanying a severe nephritis that complicated his endocarditis. In the valvular vegetation of neither of these patients were gonococci demonstrated. Since gonococci are notoriously difficult to cultivate, it cannot be stated with any certainty that no gonococci remained in the vegetations. It is possible, however, that the endocardial infection had been eradicated and that, had the processes complicating the endocarditis not occurred, these two patients might have survived. Treatment of a fourth patient with sulfanilamide proved ineffectual. Despite treatment with the drug over a period of twenty-five days and the attaining of blood levels of from 9.7 to 18.1 mg. per hundred cubic centimeters, viable gonococci were present in the endocardial vegetations at necropsy. Whether the responsible organism represented a strain of gonococcus peculiarly resistant to the influence of sulfanilamide was not determined experimentally.

Journal of Immunology, Baltimore

37: 305-412 (Oct.) 1939

- Pneumococcus Capsular Polysaccharide in Urine: Detection by Precipitation and Centrifugation. P. F. de Gara, S. C. Bukantz and J. G. M. Bullowa, New York.—p. 305.
- Experiments on Histamine Refractoriness: II. Nonspecific "Desensitization" Through Oral Application of Histamine. L. Farmer, New York.—p. 321.
- Equine Encephalomyelitis in Monkeys. R. W. G. Wyckoff and W. C. Tesar, Pearl River, N. Y.—p. 329.
- Bacterial Effect of Sulfanilamide on Pathogenic and Nonpathogenic Staphylococci. W. W. Spink, Minneapolis.—p. 345.
- Serologic Variants of Pneumococcus Types IX and X. B. Vanumen, Copenhagen, Denmark.—p. 359.
- Effect of Temperature on Combination and Aggregation and on Equilibrium in Reaction Between Antigen and Antibody. Edna M. Follensby and S. B. Hooker, with assistance of Elizabeth T. Leach, Boston.—p. 367.

Activity of Virus of Herpes Simplex for of Chick Embryo, Together with Observations on Virus by Its Specific Antiserum. M. F. Shaffer and J. F. Enders, Boston.—p. 383.

Effect of Sulfanilamide on Staphylococci.—While sulfanilamide appears to be capable of sterilizing human urine containing staphylococci, it is of doubtful therapeutic value in the treatment of bacteremia and in conditions in which the deeper tissues have been invaded by the organisms, according to Spink. This discrepancy in therapeutic effectiveness prompted him to study the bactericidal effect in vitro of sulfanilamide on various strains of staphylococci. The influence of each of the following factors on this bactericidal effect has been observed: the culture mediums, with special reference to their ingredients; the strain of staphylococcus; the number of organisms in the original inoculation; the concentration of sulfanilamide; the temperature at which the suspensions of organisms and the drug were incubated, and the initial pH of the substrate. Nineteen strains of staphylococci have been included in this study. Twelve strains belonged to the pathogenic group, and seven were considered nonpathogenic. Sulfanilamide in high concentrations had little or no bactericidal effect on organisms suspended in peptone broth and incubated at 37 C. When the mixtures of organisms and the drug were incubated at 40 C., the bactericidal effect was more pronounced. Sulfanilamide was bactericidal for the strains when the organisms were suspended in urine. The maximum effect took place at an incubation of 40 C. and was not dependent on the initial pH of the urine. The presence of small quantities of added peptone in urine completely interfered with the bactericidal action of the drug. Discussing the

significance of this action of peptone the author points out that, although peptone appears to interfere with the action of sulfanilamide on the hemolytic streptococcus, this interference seems more marked for the staphylococcus. This may account in part for the failure of sulfanilamide in the treatment of staphylococcal sepsis. The author has treated persons with sulfanilamide whose tissues were invaded by both beta hemolytic streptococcus and Staphylococcus aureus. After a period of therapy, bacteriologic studies of material from the invaded areas revealed the absence of the streptococcus, but staphylococci were still present. He suggests that in staphylococcal sepsis in which tissue necrosis is a feature of this type of sepsis, peptone-like substances are formed as the result of the breakdown of protein material and this interferes with the action of sulfanilamide on the organisms. He shows that recent studies by several investigators (Lockwood, Larson, Shaffer), although not fully explaining the relationship of peptone to the activity of sulfanilamide, throw some light on this important problem.

Journal of Lab. and Clinical Medicine, St. Louis

25: 1-112 (Oct.) 1939. Partial Index

- *Effect of Fever Therapy on Carbohydrate Metabolism. M. B. Kirstein and L. Bromberg, St. Louis.—p. 7.
- Is There a Platelet-Reducing Substance in the Spleen of Thrombocytopenic Purpura? R. H. Major and C. J. Weber, Kansas City, Kan.—p. 10.
- Effect of Gastric Mucin on Hemoglobin Regeneration in Anemic Dogs. H. S. Wigodsky, R. A. Bussabarger and S. J. Fogelson, Chicago.—p. 13.
- Effect of Sodium Bromide on Nutrition and Gastrointestinal Tract of Epileptic Patients. A. J. Arieff, Chicago.—p. 19.
- Correlation of Clinical, Electrocardiographic and Circulation Time Findings in Determining Cardiac Status in Infectious Diseases. L. H. Sigler, P. I. Nash, I. Stein and S. Epstein, Brooklyn.—p. 24.
- Frequency of Syphilis in Office Practice. H. G. Hadley, Washington, D. C.—p. 45.
- Dental Cooperation in Diabetes Mellitus. S. Blaustein and E. Ferguson, Brooklyn.—p. 47.
- Experimental Study of Rectal Administration of Mercurial Diuretics. I. J. Brightman and R. A. Lehman, New York.—p. 56.
- Routine Laboratory Examinations for Corynebacterium Diphtheriae. C. A. Perry and Elizabeth Petran, Baltimore.—p. 71.
- Rapid Technique for Syphilis Testing with Finger Blood. P. L. Kirk and C. Bennett, Berkeley, Calif.—p. 86.
- *Clinical Demonstration of Iron in Skin in Hemochromatosis. H. R. Fishback, Chicago.—p. 98.
- A Ring Test for Urine Bromides. A. Blumstein, Minneapolis, P. M. Zoll and J. J. Mayer, New York.—p. 99.

Fever Therapy and Carbohydrate Metabolism.—Kirstein and Bromberg declare that hyperglycemia during fever therapy is not due to blood concentration but to disturbances in carbohydrate metabolism. This concept may have an important bearing on the preparation of patients for hyperpyrexia, especially diabetic persons. One of the important pathologic factors in diabetes is the tendency toward an increased rate of glycogenolysis in the liver. If any factor which stimulates glycogenolysis (such as artificial fever) is superimposed on this, the result may be excessive hyperglycemia, glycosuria and frequently ketosis. (This may also explain the response of persons with diabetes to infectious fevers.) The vicious process can be combated by means of adequate administration of carbohydrates and by inhibiting the rate of glycogenolysis with insulin.

Iron in Skin in Hemochromatosis.—Fishback outlines a simple test for demonstrating cutaneous iron in hemochromatosis. He mixes equal parts of sterile solutions of 0.5 per cent potassium ferrocyanide and hundredth normal hydrochloric acid and injects the resultant solution intradermally so as to form a wheal. A slight blueness is evident almost immediately, which darkens to a deep blue within five minutes. A narrow red zone appears at the periphery of the wheal in about two days. This persists throughout the slow contraction of the blue test spot until it disappears in about two weeks. The negative test shows a white wheal in which the peripheral red zone develops later and disappears in about the same time as a positive test. There is a sharp stinging sensation with the injection, but it ceases within a few seconds. There is no pain or itching afterward. The skin remains intact without peeling or necrosis. Since diffuse iron deposit occurs only in hemochromatosis, this test would appear to be specific for the disease. In hemochromatosis the test is also positive after death.

Journal of Neurophysiology, Springfield, Ill.

2: 473-578 (Nov.) 1939. Partial Index

- Effects of Acoustic Stimuli on Waking Human Brain. P. A. Davis, Boston.—p. 494.
- Electrical Reactions of Human Brain to Auditory Stimulation During Sleep. H. Davis; P. A. Davis, Boston; A. L. Loomis, E. N. Harvey and G. Hobart.—p. 500.
- Conditioning of Afferent Impulses by Reflex Discharges Over Dorsal Roots. J. F. Toennies, New York.—p. 515.
- Vagal Inhibition of Inspiration and Accompanying Changes of Respiratory Rhythm. T. E. Boyd and C. A. Maaske, Chicago.—p. 533.
- Cerebellar Action Potentials in Response to Stimulation of Various Afferent Connections. R. S. Dow, New York.—p. 543.
- Effect of Eserine on Spinal Reflexes in Dog. J. K. Merlis and H. Lawson, Louisville, Ky.—p. 566.

Kansas Medical Society Journal, Topeka

40: 405-448 (Oct.) 1939

- Injection Treatment of Hernia Based on Study of 528 Cases. A. S. Jackson, Madison, Wis.—p. 405.
- Diagnosing Disease Without Instruments of Precision. R. H. Major, Kansas City.—p. 408.
- Subjective Cardiac Symptoms and Their Interpretation. J. M. Porter, Concordia.—p. 412.
- Superficial Cancer: Skin and Lip. M. Trueheart, Sterling.—p. 419.

Kentucky Medical Journal, Bowling Green

37: 423-462 (Oct.) 1939

- Complications of Treatment of Syphilis. F. B. Zimmerman, Greenup.—p. 446.
- Extrinsic Antenatal Intestinal Obstruction at Ileum, with Peritonitis. Margaret Hatfield, Louisville.—p. 451.
- Pathogenesis of Anemias: Anemia as a Problem for the Internist. H. Gordon, Louisville.—p. 455.

Mental Hygiene, Albany, N. Y.

23: 529-712 (Oct.) 1939. Partial Index

- Reorientation of Education to Promotion of Mental Hygiene. L. K. Frank, New York.—p. 529.
- Common Emotional Problems Encountered in a College Mental Hygiene Service. H. D. Palmer, Philadelphia.—p. 544.
- Psychotherapy for the Poor: State-City Cooperative Enterprise in Field of Mental Hygiene. J. Watson, Worcester, Mass.—p. 558.
- Some Comments on Psychopathology of Drug Addiction. R. H. Felix, Lexington, Ky.—p. 567.
- Music as Therapeutic Aid in Hospital for Mental Diseases. A. H. Harrington, Howard, R. I.—p. 601.
- Selective Mating as Factor in Socio-Economic Inferiority: Study of 3,296 Persons Related by Blood or Marriage to One Institutionalized Individual. W. E. Southwick, Washington, D. C.—p. 620.
- *Follow-Up Study of Patients with Dementia Praecox Treated with Insulin in the New York Civil State Hospitals. B. Malzberg, Albany, N. Y.—p. 641.

Dementia Praecox and Insulin.—The condition of 1,039 patients with dementia praecox who received insulin shocks prior to March 1938 is given by Malzberg, who asserts that 134 were reported as recovered after the completion of treatment, 282 were much improved and 263 improved. This makes a total of 679, or 65.4 per cent, who showed some degree of improvement following treatment with insulin. Compared with a corresponding group of patients who received no specific shock therapy, the results obtained were remarkably favorable. Thirteen patients died during the course of treatment. After much shifting in the results of the 134 patients described as recovered at the termination of treatment, only seventy-three were so described at the time of the follow-up (14.4 months after completion of treatment). Of the remainder, twenty-one were much improved, seventeen improved and twenty unimproved. Of the 282 much improved patients, 111 remained in this category; however, forty-three improved to such a degree that they were considered as being recovered. On the other hand, 162 had deteriorated and fifty-five were described as merely improved and sixty-seven as unimproved. Of the 263 who had originally been considered as improved, 116 had deteriorated during the ensuing year. But thirty-eight showed further improvement, eleven of whom were considered recovered. Finally, of the 347 originally deemed as unimproved, five later showed a complete recovery, eleven were much improved and twenty-one were improved. Though some patients showed various degrees of deterioration in their mental status following the termination of insulin therapy, an appreciable total continued to improve, a phenomenon that was observed also by Sakel, who likened it to a process of ripening. Approximately an average of fourteen months after the termination of insulin therapy, 12.9 per cent of the patients were described as recovered and 49 per cent as improved to some degree. There was thus a significant reduction in the percentage of

patients who maintained their improved status. Nevertheless the author declares that this percentage is in significant excess of corresponding results among similar patients who did not receive specific shock therapy. Paranoid and catatonic types of patients showed better results than hebephrenic individuals. Patients with a short duration of the disease prior to treatment showed the highest rates of recovery and improvement. Those regarded as recovered and much improved showed the highest rates of discharge and parole and the lowest rates of relapse. Therefore it is evident that to secure the best results it is necessary to institute treatment in the early periods of the disease.

Missouri State Medical Assn. Journal, St. Louis

36: 427-470 (Nov.) 1939

- The Male Sex Hormone. W. M. Ketcham, Kansas City.—p. 427.
- Pneumoperitoneum, with Unusual Complication. C. J. Mellies, Mount Vernon.—p. 430.
- Fibrositis. O. Abel Jr., W. J. Siebert and R. Earp, St. Louis.—p. 435.
- Missouri Cancer Survey. P. F. Cole, Springfield.—p. 437.
- Removal of Portion of Stomach Tube from Stomach Through Esophagoscope: Report of Case. M. F. Arbuckle and A. C. Stutsman, St. Louis.—p. 441.
- Ectopic Decidual Cells. J. G. Sheldon, Kansas City.—p. 441.
- Infant Feeding. A. Bleyer, St. Louis.—p. 442.
- Common Sense in Pediatric Practice. C. B. Summers, Kansas City.—p. 444.
- Sulfanilamide and Complications of Scarlet Fever. H. J. Ulrich and T. R. Young, St. Louis.—p. 445.
- Prevention of Pulmonary Tuberculosis. H. L. Mantz, Kansas City.—p. 447.
- Symptoms, Signs and Diagnosis of Pulmonary Tuberculosis. J. A. Stocker, Mount Vernon.—p. 450.
- Differential Diagnosis of Chronic Pulmonary Diseases. D. W. Myers, St. Louis.—p. 451.
- Sanitarium Treatment of Tuberculosis. G. D. Kettelkamp, Koch.—p. 453.
- Home Treatment of Pulmonary Tuberculosis. W. M. Kinney, Joplin.—p. 455.
- Surgical Procedures in Treatment of Pulmonary Tuberculosis. J. L. Mudd, St. Louis.—p. 457.
- Missouri Tuberculosis Association. D. E. Pratt, St. Louis.—p. 459.

New England Journal of Medicine, Boston

221: 635-678 (Oct. 26) 1939

- Anterior Pituitary Gland and Diabetes Mellitus. F. G. Young, London, England.—p. 635.
- *Gas Bacillus Infection of Abdominal Wall. H. M. Clute and T. J. Anglem, Boston.—p. 647.
- Primary Streptococcal Peritonitis: Report of Case Which Developed While the Patient Was Undergoing Sulfanilamide Therapy. T. W. Botsford and T. H. Lannan, Boston.—p. 651.
- Laboratory Diagnosis of Encephalitis Due to Equine Virus. P. J. Jakmaul and R. F. Feemster, Boston.—p. 653.
- Contagious Diseases. C. Wesselhoef, Boston.—p. 655.

Gas Bacillus Infection of Abdominal Wall.—Clute and Anglem report two cases of gas bacillus infection of the abdominal wall complicating cecostomy done for obstructing carcinoma of the colon. Both patients recovered after treatment with polyvalent gas bacillus antitoxin. In the first case the simultaneous occurrence of a constricting annular carcinoma of the splenic flexure and a volvulus of the sigmoid were the most significant feature. It constituted virtually a closed intestinal loop, which has been shown to provide optimal conditions for the proliferation of *Clostridium welchii*. The diagnosis in the fulminating type of infection represented by this case is usually made without difficulty. The process develops with lightning-like rapidity and usually occurs within twenty-four to thirty-six hours after operation. The pulse and temperature rise abruptly and the patient is in a state of severe shock which appears out of proportion to the local observations. There is generally delirium and there is severe pain referred to the wound. The local observations, the coppery red discoloration of the skin, the crepitation and the marked tenderness on palpation are classic. The second patient, who had a carcinoma of the transverse colon, underwent a purse-string type of cecostomy. The patient's convalescence was entirely without incident until the seventh postoperative day, when the temperature rose to 102 F. and the pulse to 115. On the following morning the discoloration had taken on the coppery red color characteristic of *Clostridium welchii* infection. Crepitus, which could be heard with a stethoscope, was present in the tissues all about the incision. The report on the culture was somewhat equivocal. Nevertheless the clinical features of the disease, while not so fulminant as in the first

case, were so clearcut and definite that the authors had no doubt whatever that it represented a gas bacillus infection of the abdominal wall. The successful treatment of gas bacillus infection is dependent on early recognition and immediate institution of therapeutic measures. The rarity of this type of infection as a complication of abdominal surgery may lead to confusion and failure to establish the diagnosis. Delay may be fatal. If there is suspicion of gas bacillus infection, smears and cultures should be made at once. While waiting for culture reports, however, active treatment should be instituted at once of any patient who is suspected of having gas bacillus infection. The wound must be widely and freely opened by removing the skin and fascial sutures. In each of the reported cases only the peritoneal suture line was left intact after the wounds were opened. Dressings wet with hydrogen peroxide may be applied to the wounds and should be kept saturated with this solution. The authors relied almost entirely on the use of large amounts of polyvalent gas bacillus antitoxin with excellent results. In early 1937 sulfanilamide had not been proved beneficial in gas bacillus infection and it was not used. Today it would be used but the authors think that the antitoxin should be used as well. In the fulminating type of infection they administer daily by intravenous injection from three to four ampules (from 90 to 120 cc.) of antitoxin. This is continued until the infection is under control. It may be necessary to continue treatment for seven days or longer. In the milder cases the dosage of antitoxin may be from two to three ampules (60 to 90 cc.) daily.

Southwestern Medicine, El Paso, Texas

23: 319-352 (Oct.) 1939

Carcinoma of Colon (Other Than the Rectum). E. P. Palmer, Phoenix, Ariz.—p. 319.

Recent Advances in Medicine. C. D. Awe, El Paso, Texas.—p. 322.

Allergy and Pseudoallergy in General Practice. R. W. Lamson, Los Angeles.—p. 325.

*Sulfapyridine in Treatment of Thirty Cases of Pneumonia. J. M. Rawlings, El Paso, Texas, and L. Hamilton, Artesia, N. M.—p. 329.

Impaired Nasal Ventilation in the Adult. L. F. Morrison, San Francisco.—p. 333.

Common Dermatoses. N. P. Anderson, Los Angeles.—p. 336.

Sulfapyridine for Pneumonia.—Rawlings and Hamilton report the results obtained in six cases of bronchial and twenty-four cases of lobar pneumonia following treatment with sulfapyridine. There were two deaths; in both, tuberculosis was a complication. Other aids in addition to sulfapyridine were used when it was felt that they would be of value. In addition to the drug, oxygen was given to seventeen patients, transfusions to seven and serum to four. Four fifths of the patients had complications of varying grades. The average dose of sulfapyridine was 39.19 Gm., but for the mild cases showing minimal complications it was 22.11 Gm. Leukocyte counts were extremely helpful in following the condition of the patients, and when there was any indication that the counts were low and the patient's condition not otherwise good, transfusions and serum were used. One danger resulting from the use of the drug, in addition to the gastric disturbance, is seemingly an evident depression of the formation of erythrocytes or their destruction. By blood culture or sputum typing, twenty-eight of the thirty cases of pneumococcic pneumonia were proved. Of these proved cases recovery occurred in all but one, giving a final mortality of but 3.93 per cent of the proved cases. The authors state that the only untoward result in their cases was the presence of a definite anemia in seven. They conclude that patients with lobar or bronchial pneumonia whose prognosis has heretofore been considered completely hopeless by older methods of treatment can, by the combined use of their six measures, have a much greater likelihood of living. These measures consist of early use of sulfapyridine, oxygen when the temperature is 101.5 F. or more, a pulse of more than 120 and respirations over twenty-four per minute, adequate use of dextrose and saline solution when indicated, digitalization of all heart failures, serum in large amounts in all critical cases, and adequate use of transfusions when anemia is present. Two other general procedures that should not be neglected are the use of liver extract in cases of leukopenia and ascorbic acid, thiamin chloride, riboflavin and small amounts of nicotinic acid in many of the borderline avitaminoses or when general bodily metabolism is not optimal.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

23: 649-696 (Oct.) 1939

*Familial Primary Glaucoma in Adults. A. H. Briggs.—p. 649.

Iritis (White Eye) in Fowls. J. E. R. McDonagh, account of histologic changes by E. Wolff.—p. 659.

Note on Phlyctenular Ophthalmia. J. Barrett.—p. 669.

Resection of Anterior Staphyloma of Cornea by Means of Gradual Incisions. N. I. Shimkin.—p. 671.

Familial Primary Glaucoma in Adults.—Briggs has encountered two families in which simple glaucoma appears to be a familial condition. The mechanism by which the hereditary influence acts is unknown; defective development of the angle of the anterior chamber seems to be the most probable cause, but statistics suggest that the causes of buphthalmia, hereditary glaucoma and nonhereditary glaucoma are separate and distinct. There seems to be no association between hereditary primary glaucoma and buphthalmia. There is little evidence to support the suggestion that hereditary glaucoma is due to some degree of congenital microphthalmia with a disproportionately large lens. The first family that the author describes was probably affected through three generations, but no cases have yet been discovered in the fourth, although, curiously enough, several members of the fourth generation have defective sight. The three patients of the fourth generation who have come under observation have been found to be suffering from quite unrelated disorders of the eyes and to show no sign of glaucoma. Of eleven legitimate children of the third generation, two died in infancy; of the remaining nine, three were certainly glaucomatous and two more suffered from optic defects which were probably glaucoma; two more had defective sight which may have been due to glaucoma, and two were unaffected. One of the two unaffected members died at the age of 24, too early for the condition to be ascertained. In one member of this family a spontaneous choroidal detachment developed about three months after sclerocorneal trephining, and this persisted unchanged for a year. It was (unsuccessfully) treated by a cautery puncture and is still present. The second family comprises ten siblings, one of whom died in infancy. Of the nine living siblings, eight are said to be glaucomatous and six have been examined. Of these, five were glaucomatous and one was unaffected.

British Journal of Radiology, London

12: 569-600 (Oct.) 1939

Radiology of Third and Fourth Ventricles: Part II. E. W. Twining.—p. 569.

British Medical Journal, London

2: 795-840 (Oct. 21) 1939

Treatment of Closed Fractures of Radius and Ulna. St. J. D. Buxton.—p. 795.

Clinical Significance of Tubercle Bacilli in Urine. C. E. Dukes.—p. 799.

Psychologic Aspect of Rearmament Program. S. B. Hall.—p. 801.

*Does Poliomyelitis Affect Intellectual Capacity? Investigation on Ninety-Eight Cases. R. G. Gordon, J. A. F. Roberts and Ruth Griffiths.—p. 803.

Prevention of Defaulting from Venereal Disease Treatment Centers. C. H. Wilkie.—p. 805.

Poliomyelitis and Intellectual Capacity.—Gordon and his colleagues determined the intelligence quotients, by the Stanford-Binet scale, of ninety-eight children from 4 to 16 years of age under treatment for acute anterior poliomyelitis or its residual effects. In some of these children the onset of the disease occurred several years before the tests were applied. The mean intelligence quotient of the group was 103.91, with a standard deviation of 15.89. In comparison with a random group of normal school children whose mean intelligence quotient was 98.8 and standard deviation 15.2 it is seen that the mean performance of children who are suffering or have suffered from poliomyelitis does not fall below the performance of a random group of normal children drawn from the general population. A more precise examination showed that the distribution of intelligence quotients did not show any significant departure from what would be expected on the basis of the normal curve. The result was what would be obtained from a sample of similar size drawn from the general population. Therefore it can be concluded that children who suffer from poliomyelitis give just the same average results as do ordinary normal children and

that the variability of the results also (their spread and range) is that of a normal group. The mean intelligence quotient of the forty-six girls was 102.1 and of the fifty-two boys 105.5. The difference is not statistically significant. Neither was there any association between the intelligence quotient and the age of onset of the disease, the interval between onset of the disease and the performance of the test or the occurrence of clinically recognizable cerebral symptoms at the onset of the disease.

Edinburgh Medical Journal

46: 613-668 (Oct.) 1939

- Care and Cure of the Crippled Child in the Southeast of Scotland. W. A. Cochrane.—p. 613.
 *Microscopic Inquiry into Etiology of Poliomyelitis with Note on Chronic Encephalitis Lethargica. A. C. Coles.—p. 627.
 Cancer of Mouth and Jaws. J. J. M. Shaw.—p. 639.
 Occurrence of Different Groups of Hemolytic Streptococci in Human Infections. Helen M. Gardner.—p. 648.

Poliomyelitis and Chronic Lethargic Encephalitis.—In examining microscopic films of the cord, brain, lymph glands, spleen and other organs of human beings and monkeys with acute poliomyelitis, Coles found certain microscopic structures which are not normally present. Small sporelike organisms staining blue with Giemsa stain and varying in size from almost invisible bodies to those from 3 to 5 microns or more in diameter were found in the cord, brain, lymph glands and heart blood of infected monkeys and in the cord and brain of human subjects. Many of the larger forms have more deeply stained spots in their interior as if they were undergoing development. Somewhat similar blue-stained spores were found in films from the nasopharynx. The same bodies were present in many of the capillaries of the cord and brain of human and animal subjects. Cystlike bodies, staining red with Giemsa stain, measured on an average from 3 to 6 microns and showed evidence of some internal structure. Intracellular Negri-like bodies measuring from 1 to 14 microns were found in the cord and brain of human beings and monkeys. Films of the cord and brain of two subjects with acute poliomyelitis showed all the forms seen in acute poliomyelitis, but in comparatively smaller numbers. In preparations from the brain of a subject with chronic lethargic encephalitis, all these structures were present and the blue-stained sporelike bodies, both free and intracapillary, were numerous. These films were practically indistinguishable, from a morphologic point of view, from those of poliomyelitis. In films of the infective filtrates of the cord suspension of three monkeys with poliomyelitis, extremely small, round or oval, well defined elementary bodies measuring from 0.15 to 0.2 or 0.3 micron were present. These stained a reddish color and occurred in almost pure cultures. It seems highly probable to the author that these elementary bodies are the actual causal virus of poliomyelitis. It is possible that the sporelike, cystlike and intracellular bodies are stages in the development of an organism which in its final stage is a filtrable body.

Lancet, London

2: 817-864 (Oct. 14) 1939

- Bacteriology of Rheumatic Fever. W. R. F. Collis.—p. 817.
 *Testosterone Propionate in Chronic Mastitis. A. W. Spence.—p. 820.
 Dissemination of Infection in School Dormitories. F. G. Hobson.—p. 823.
 Stomatitis of Dietary Origin. W. R. Aykroyd, B. G. Krishnan and R. Passmore.—p. 825.
 *Effect of Prolactin on Lactation in Nursing Women. M. Kenny and E. King, with notes on preparation of prolactin by N. Evers and W. J. Hurran.—p. 828.
 Blood Grouping Technic with Test for Syphilis. A. H. Walters.—p. 831.

Testosterone Propionate in Chronic Mastitis.—Spence reports observations on twenty-four patients with painful breasts and so-called chronic mastitis. In view of the pronounced psychologic element in the genesis of mammary pain, all patients were first treated with intramuscular injections of sterile olive oil as a placebo twice a week for several weeks. Thirteen patients had a dramatic improvement in the pain, whether it was continuous or not. Four patients thus improved had a fairly large lump in the breast. A large nodular mass in the right breast of one patient disappeared during the control period of three months. Had she been receiving testosterone, the improvement in the breast would have been ascribed to this. To eight patients with no lumps whose pain was completely or greatly relieved with olive oil, no further treatment was given. To sixteen patients whose breasts contained a lump or whose pain was not relieved

by olive oil, intramuscular injections of testosterone propionate were given twice or three times a week. The dose employed for most patients at first was 25 mg. twice a week. If the response to this after a few weeks was unsatisfactory, the dose was increased to 50 mg. twice a week and later for some to 100 mg. twice or three times a week. Treatment was continued for various periods, depending on the response. There was thus a considerable variation in the total dosage, some patients receiving only from 100 to 500 mg. and others as much as from 2,000 to nearly 3,000 mg. Fourteen of the sixteen patients had relief from pain. Twelve patients treated had lumps in the breast; the lumps of three disappeared, but for two of these spontaneous disappearance could not be excluded, and for one 2,925 mg. in five months was required, resulting in hypertrophy of the clitoris and extreme atrophy of the endometrium. Five patients had some reduction in the size of the nodules. Of two who were not improved, fresh nodules appeared in the breast during treatment. Menstruation of seven patients receiving the larger doses was suppressed. Five of the younger patients had and increased growth of hair, four with comparatively small doses, but this was not observed in older patients receiving much larger doses. It is emphasized that because of this complication and the undesirability of prolonged atrophy of the endometrium, testosterone propionate should be used with caution for women.

Prolactin for Nursing Women.—In the experiments described by Kenny and King two preparations of prolactin, one from ox pituitary and the other from sheep, were administered to forty-three women during the period of lactation. The women were selected as deficient in milk secretion at different stages of this period up to the third month. In three cases milk secretion was absent until administration of prolactin was begun on the ninth or tenth day after delivery. All cases were followed up for at least three months and most for six or seven months. The response to administration was classified as positive, partial or negative. A positive response indicated that the increase in milk secretion was maintained at over 3 ounces (100 cc.) a day. A partial response indicated an increased yield of from 1½ to 3 ounces (50 to 100 cc.) of milk a day, or a larger yield which was not maintained when the injections of prolactin were stopped. An increase of less than 1½ ounces (50 cc.) was classified as a negative response, a failure. Prolactin was given in the early stages of the period of lactation, when clinical experience or the past history indicated that the patient would probably not have sufficient milk. In the later weeks deficiency or decrease in lactation was treated. At present it is the practice of the authors to begin treatment as early as possible, so that efficient nursing may be established before discharge from the hospital. They employed a total dosage of 15 cc. (900 Riddle units) of prolactin in each case, spread over five days, thus: first and second days 5 cc. daily, third and fourth days 2 cc. daily, and fifth day 1 cc. The quantity was given by the intramuscular route into the buttock or arm. To a few neurotic women an injection of sterile saline solution 2 cc. was given forty-eight hours before the start of treatment with prolactin. This suggestion therapy did not evoke a response in any case. In the dosage described, the extracts appear to have no systemic or local ill effect. Dextrose tolerance tests have not shown any departures from those of control lactating women. Depression of the gonadotropic function has not been observed. The quality of the milk secreted after administration of the extracts is essentially the same as that of control samples. About the effect on the lactation, the authors say that in three fourths of the women with deficient lactation in the first eight weeks of the lactation period satisfactory nursing was induced with prolactin. A further few cases showed only a temporary or moderate increase of milk secretion after the administration of prolactin and in 19 per cent there was either a small increase or none at all.

Medical Journal of Australia, Sydney

2: 491-528 (Sept. 30) 1939

- Pathology of Coronary Ischemia. T. E. Lowe.—p. 491.
 Some Practical Considerations in Coronary Occlusion. G. A. Penington.—p. 501.

2: 529-560 (Oct. 7) 1939

- Wounds of the Hand. A. Aspinall.—p. 529.
 Treatment of Wounds of the Hand. L. Teece.—p. 532.
 Anatomy in Surgery. H. R. G. Poate.—p. 534.
 Gallstones and Their Complications. H. Bullock.—p. 541.

Presse Médicale, Paris

47: 1413-1436 (Oct. 18) 1939

- Treatment of Open Diaphyseal Fractures from War Wounds. P. Mathieu.—p. 1413.
Symptoms of Ordinary Aseities. J. P. Urioste, R. A. Caimi and R. A. Piaggio Blanco.—p. 1414.
Roentgen Therapy in Infectious Diseases. J. Surmont and P. le Goff.—p. 1417.
*Therapies Employed in Hemogenia: Value of Roentgen Therapy. M. Lévy and L. Gally.—p. 1420.

Roentgen Therapy of Spleen in Hemogenia.—Lévy and Gally appraise the therapeutic managements at present employed in hemogenia, such as splenectomy and various treatments of a nonsurgical character. They select four of their twenty-eight cases, in which roentgen treatment was successfully instituted, for special discussion. The four women with age level between 26 and 49 manifested a hemorrhagic diathesis in epistaxis and menorrhagias, accompanied with ecchymosis in one case. The bleeding time indicated was between four and one half and forty-five minutes, the clotting time between eighteen and twenty-six minutes. The treatments varied from a total of 870 roentgens to a total of 4,500. The curative results achieved included hemostasis at the nose, gums and skin, reduction of the bleeding time from eight to one and one half minutes in one case and clotting time from eighteen minutes to six minutes in another and normalization of the menstrual flow in one case after the first application of 250 roentgens. One patient, examined after two years, had had a normal pregnancy and delivery. The authors think that the negative results reported by others for roentgen therapy are due to several factors: (1) insufficient dosage (in one case a total of 200 roentgens was reported), (2) inattention to individual sensitivity variations (in one case a cure may be effected by 250 roentgens whereas another may require 1,500 and more) and (3) failure to recognize that the whole reticulo-endothelial system may be involved, not merely the spleen. The authors consider their clinical results satisfactory. In their most serious case hemostasis persisted after five years. The erythrocytic counts became normal without antianemic medication. They reject splenectomy in benign and acute cases because of the high immediate or delayed mortality and the recidivations due to surgery, some brilliant operative achievements notwithstanding. They recommend the application of roentgen therapy not only to the spleen but to the whole reticulo-endothelial system, especially the areas rich in ganglions, such as the inguinal and axillary, since hyperfunction of the spleen may be secondary to hyperfunction of the reticulo-endothelial system. The systematic use of roentgen therapy in benign cases may constitute a prophylaxis against further evolution and make operation unnecessary.

Gastroenterologia, Basel

64: 177-258 (Sept.) 1939

- Case of Sprue. R. M. Teecon.—p. 177.
Roentgenogram of Small Intestine in Nontropical Sprue. M. Lüdin.—p. 191.
Criticism of Internal Therapy of Uleer. H. Stalder.—p. 198.
*Hyperazotemia in Digestive Hemorrhages. M. Demole and J. Neeser.—p. 208.
Reasons for Employment of Electromagnetic Waves in Gastro-Enterologic Surgery. H. Paschoud.—p. 226.

Hyperazotemia in Digestive Hemorrhages.—Demole and Neeser say that it was Sanguinetti who in 1933 first called attention to the appearance of uremia following gastrointestinal hemorrhages. In view of the fact that the increase in the urea content of the blood is slight after intestinal hemorrhages, the authors prefer the term "hyperazotemia" to uremia. They investigated this condition in a series of fifty cases. They found that digestive hemorrhages provoke an elevation in the urea content of the blood in three of four cases. This hyperazotemia is mild; it appears early and is not lasting. It is accompanied by a strong augmentation of the urinary secretion of urea and by hypochloruria, whereas the chlorides of the blood vary hardly at all. It does not seem to have an unfavorable clinical significance. It does not indicate an unfavorable prognosis. It has no direct relationship to the abundance of the loss of blood, the degree of anemia or the nature of the causal lesion. Among the factors that have been invoked to explain the hyperazotemia that follows digestive hemorrhages, chloropenia can be excluded. The tissular disintegration consecutive to fasting for one part and purely functional renal disturbances for another

part assume an occasional or a supporting role but are always secondary. The resorption of the blood poured into the intestine is certainly the chief cause of the hyperazotemia. The authors show that the arguments in opposition to this theory are refuted by clinical and experimental evidence. In hematemesis, when nearly all the blood is expelled through the mouth, the urea content of the blood is rarely elevated; however, in melena, when the blood remains for some time in the intestine, hyperazotemia develops in five of six cases.

Bullettino delle Scienze Mediche, Bologna

111: 313-436 (Sept.) 1939. Partial Index

- Passage of Action of Local Anesthesia from Reversibility to Functional Irreversibility: Therapeutic Study. A. Donaggio.—p. 363.
*Pyelography in Diagnosis of Extrarenal Abdominal Tumors. L. Guardabassi.—p. 384.
Treatment of Pneumonia and Bronchopneumonia by 2-(Para-Amino-phenylsulfamide) Pyridine. I. Cugnini.—p. 387.

Pyelography in Extrarenal Abdominal Tumors.—Guardabassi discusses the value of pyelography in the diagnosis of extrarenal abdominal tumors in twenty-seven cases. Outward lateral displacements of the kidney are caused by paravertebral tumors (abscess, aneurysm of the aorta and tumors of the lumbotracheal lymph nodes) as well as by tumors of the adrenal capsule. Medial displacements of the structure are rare. Only one case was observed in the group of cases reported. It was a case of metastasis of the renal region from cancer of the uterus. Downward displacements of the kidney are caused by tumors which are located in structures near the upper zone of the renal cavity, namely adrenal tumors or echinococcal cysts, retroperitoneal or at the root of the mesentery. They may also be caused by tumors of the spleen and the liver, if acute splenomegaly or hepatomegaly exists. Upward displacements of the kidney are rare. They may be caused by certain retroperitoneal tumors. Backward displacements are caused by large abdominal tumors (paravertebral cystofibrosarcoma, dermoid cysts of the ovary and large tumors of the liver). Outward frontal displacement is rare. No case of the type was seen in the group reported by the author. The ureters may be displaced by retroperitoneal tumors only, which are those displacing either the structure or the kidney more frequently than any other extrarenal abdominal tumor. Intraperitoneal tumors compress the ureters without displacing them. Displacement of the pelvis is rare. It was observed in only one case of twelve cases of intraperitoneal abdominal tumors in the group of cases reported by the author. It was a case of retroperitoneal metastases from a large ovarian cystosarcoma. The most frequent morphologic alteration of the urinary tract from extrarenal abdominal tumors is a more or less acute dilatation of the pelvis and ureters from tumoral compression or else by propagation of the tumor or by metastases.

Lattante, Parma

10: 519-566 (Sept.) 1939. Partial Index

- *Pathogenesis of Infantile Tetany. A. Dordi.—p. 527.
Medical Treatment of Acute Anterior Poliomyelitis. P. Tolentino.—p. 536.

Infantile Tetany.—Dordi discusses the pathogenesis of infantile tetany, with especial reference to the role of increased guanidinemia. Because of the fact that infantile tetany is often associated with spasmophilia, the author followed the behavior of guanidine in the blood of nine infants who were suffering from infantile tetany with or without rickets but uncomplicated by any other disease. He also followed the behavior of the electrolytes in the blood. The diagnosis of spasmophilia in the cases reported by the author was made by (1) the clinical symptoms, (2) the results of the electrical stimulation of the median nerve and (3) the verification of the presence of hypocalcemia. The author found that when the determinations of the substances in the blood were made during actual tetany the amount of guanidine in the blood was normal, that of calcium was diminished and that of potassium was moderately increased. When the determinations were made after recovery of the patients, the amount of guanidine in the blood had remained unchanged, whereas those of calcium and potassium had returned to normal. The author believes that an increased amount of guanidine in the blood in the course of certain diseases in chil-

dren may be the cause of tetanoid symptoms complicating the disease. However, it is not the pathogenic agent of infantile tetany which is caused by a rupture of the equilibrium of the electrolytes in the blood (hypocalcemia in infantile tetany and hyperpotassemia in experimental guanidine tetany).

Deutsches Archiv für klinische Medizin, Berlin

184: 489-636 (Aug. 30) 1939. Partial Index

- Late Effects of Amputations on Whole Organism: 1. Amputations and Body Weight. C. E. Schuntermann.—p. 489.
*Hereditary Fibrinopenia. G. Schönholzer.—p. 496.
Casuistics of Spontaneous Hypoglycemia. K. T. Tenner.—p. 511.
Eosinophilia in Splenomegaly. J. Cremer.—p. 519.
Granulocytopenia. S. Tbaddea and D. Bakalos.—p. 530.
Elimination of Ascorbic Acid in Thyrotoxicosis. L. Norviit.—p. 562.
Movements of Diaphragm and Thorax After Deepest Inspiration and Expiration. A. J. Anthony and M. Broglie.—p. 627.

Hereditary Fibrinopenia.—Schönholzer's patient, a boy of clinically healthy parents, was first hospitalized for serious epistaxis when about 12 years of age. He was rehospitalized twice during a period extending over more than three and one-half years and finally died of a severe pulmonary edema. Anamnesis disclosed umbilical hemorrhage at birth lasting twelve days, a fall when 2 years old that injured his head and caused an enormous subcutaneous hematoma and since then a persistent tendency to bleeding, especially at the gums on tooth extraction. At his first hospitalization, tamponage and a blood transfusion of 600 cc. were immediately effective and his recovery from serious anemia, as the result of appropriate medication, rapid. He was rehospitalized one and one-half years after for pronounced anemia and severe pain in the left side of the thorax and in the stomach. A large blood effusion in the left pleura was discovered. A blood transfusion of 350 cc. was at once made. A subsequent pleural puncture showed almost pure sterile blood. Treatments for anemia were resumed and made possible his discharge. Several months later a special hematologic analysis was undertaken. No trace of fibrin formation was discoverable even after forty-eight hours and neither blood nor plasma would clot in the test tube. The patient was hospitalized for the third time about two years subsequently. Increasing fatigue, pallor, slight nasal and pharyngeal hemorrhages and a comatose condition were noted. The analysis of the blood albumin indicated the complete absence of fibrinogen in spite of various tests. Blood clotting was attained only on heating at 165.2 F. Sternal puncture performed immediately after the patient's death revealed a large decrease of plasma cells and a large increase of reticular cells. Necropsy showed a clinical picture of extensive intracranial bleedings and a huge epidural hematoma. Among the thirty-nine family members traced by the author, the following familial facts are brought out: A sister of the patient died seventeen days after birth from uncontrollable umbilical hemorrhage; another sister aged 15, while clinically healthy, was found to have a blood clotting time of twenty-one minutes and a fibrinogen level of 0.13; a maternal grandfather had a lifelong hemorrhagic diathesis, especially of the gums, and, like his sister, died of apoplexy. The other blood relatives examined were normal; for those who could not be examined a normal anamnesis was reported. In his discussion of hereditary fibrinopenia, the author distinguishes between fibrinogen deficiency (fibrinopenia) and fibrinogen absence (afibrinemia), the latter represented by this case. The former disease is compatible with a normal life. Predisposition to bleeding is slight and clotting time nearly or altogether normal. A congenital tendency to fibrinopenia, however, is recognizable on further examination as hereditary. The second disease, an exacerbation of the former, invariably occurs in children and its prognosis is unfavorable. The disease is characterized by a complete absence of fibrinogens in the plasma and the consequent incoagulability of the blood. Etiologically the author considers the bone marrow chiefly, though not exclusively, implicated. The significance of plasma cell involvement needs, he says, further investigation. Activation of congenital hemorrhagic diathesis is attributable chiefly to traumas that need only be slight. However, multiple bleedings suggest the implication of the vascular system, perhaps under the influence of intercurrent infections. The author thinks that the facts point to a recessive heredity of an intermediate kind that is not sex limited.

Wiener klinische Wochenschrift, Vienna

52: 825-856 (Sept. 3) 1939. Partial Index

- Prevention of Tuberculosis from Standpoint of Pediatrician. K. Diehl.—p. 827.
Fate of Prematurely Born Children. T. Kernau.—p. 834.
Diagnosis of Acute Appendicitis in Children. H. Koch.—p. 836.
Cirrhosis of Liver in Early Childhood. R. Priesel and F. Schuler.—p. 840.
*Protective Inoculations Against Diphtheria and Schick Test. Thea Steinhardt.—p. 843.

Diphtheria Inoculations and the Schick Test.—Steinhardt reports the results of several years' experiments with protective inoculations against diphtheria and the reliability of the Schick test. The experiments were carried out in several series. Of 151 Schick positive children injected with 1 cc. of alum toxoid, seventy (46 per cent) became Schick negative, fifty-five in from two to five and fifteen in from six to eight weeks. During this period, eighty-one (54 per cent) remained Schick positive. Reexamination by the Jensen method of forty-six of the seventy Schick negative children from eight to ten months later disclosed that 80 per cent had an antitoxin titer of over 0.01 and 20 per cent a titer under this figure. Simultaneous examination of the eighty-one children remaining Schick positive disclosed that 47 per cent became Schick negative without having diphtheria or becoming immunized in the meantime. In another series of experiments, sixty-eight Schick positive children with titer under 0.0005 were injected with 1 cc. of alum toxoid. Eighty-three per cent showed increase over this figure in from four to five weeks, but only 67 per cent showed increase over the figure of 0.01. Examination of twenty-one of the sixty-eight children from eight to ten months later disclosed that only two of the children had a decreased titer to under 0.01 and in eleven children there was a further increase of titer. Children with titers over 0.0005 displayed enormous increase of titer following the injection. The antitoxin titer of twenty-eight of these children was again examined from one and a half to two years later, this time according to the intracutaneous method of Römer on guinea pigs, and in only fourteen cases (50 per cent) was the Schick standard set at 0.01 attained. In all, 301 Schick reactions were carried out and the percentage of error was about 7 per cent. Schick tests with decreased doses of toxin gave no practicable results. The author is in favor of immunization and recommends it at the age of from 10 to 11 months at the time of vaccination against smallpox. He likewise recommends a second injection from eight to ten months after the first.

Ugeskrift for Læger, Copenhagen

101: 1097-1130 (Sept. 21) 1939

- Traffic Accidents. T. Eiken.—p. 1097.
Oxygen Treatment of Gas Intoxication. N. R. Christoffersen.—p. 1105.
Vaccine Treatment of Chancroid and Inguinal Buboec. Mildrid Andersen.—p. 1107.
*Sulfanilamide Treatment of Chancroid and Accompanying Buboec. A. Kristjansen.—p. 1109.
"Altatuberculin" and Purified Tuberculin: Standardization; Preparation of Solutions with Keeping Qualities. K. A. Jensen, G. Bindlev, K. Schütz Möller, A. Hansen and P. Lind.—p. 1112.
Apparatus for Mechanical Artificial Respiration. A. C. Andersen.—p. 1116.
Tests of Vision for Seamen. F. E. Reymann.—p. 1118.
Case of Myelomatosis. N. Svith.—p. 1119.

Sulfanilamide for Chancroid and Accompanying Buboec.—Kristjansen says that after one series of treatments (13.5 Gm. of sulfanilamide) nine of twelve cases of chancroid were cured in from eight to ten days and there was no recurrence; two of the cases were complicated with buboec. The infection at the start of treatment was from seventeen to 105 days old. In one instance a second series of treatments after an interval of two weeks was effective; the complicating bubo was healed during the first series. In one case, with infection five months old, supplementary treatment with iodoform was necessary, and in one case, with infection three weeks old, complicated with a large bubo resistant to sulfanilamide four injections of dmecos vaccine resulted in healing without perforation. The by-effects of the treatment were slight; in two cases there were nausea and headache which did not necessitate interruption of the treatment. The average length of hospitalization was 20.3 days, as against an average of 35.3 days for the twelve patients with chancroid treated immediately before the introduction of streptomycin.

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How to Elicit and Evaluate the Patient's Complaint

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My purpose in this discussion is to help the physician, especially the recently graduated one, to acquire effective methods of attacking a clinical problem and, by specific and concrete suggestions concerning the art and science of history taking, to enable him to acquire this ability more quickly than he might otherwise acquire it.

The medical student is introduced to the subject of history taking by memorizing a list of questions which he will put to his patients. These questions have to do with all the symptoms which may manifest themselves in all parts of the human body during a lifetime. Early in his medical practice, however, he learns that the patient's answers to these questions do not necessarily constitute an accurate or diagnostically helpful clinical history.

OBJECTIVES

In eliciting a clinical history there are three main objectives which a physician should strive to attain: First, from the data that the patient gives he must be able to cull the significant facts which, when developed into a history, may lead to a correct diagnosis. In order to be able to do this he must know well the symptoms of all the diseases to which mankind is subject. The man who is an expert at detecting counterfeit money acquires this ability by becoming thoroughly familiar with all characteristics of the genuine. So the man who is to evaluate properly a patient's complaints must be familiar with those symptoms which indicate organic disease so that he may be able to recognize those which do not.

Second, he must strive to develop speed in taking histories. In the practice of medicine as in any other profession, while accuracy in observation and judgment is absolutely essential the element of conservation of time also is of great practical importance. This is especially obvious in group practice, in which the slowness of one physician increases the load which the

other members of the group must sustain. Speed must not be attained at the expense of accuracy, but with practice both can be achieved.

Third, he must strive to please each patient. Patients vary greatly as to their emotional stability, intellectual capacity, keenness of perception and general reaction to the questioning and examination which enable the physician to make a diagnosis. One patient may respond intelligently to, while another patient may be affronted by, the same question put to the two patients in the same courteous way. Therefore the physician must develop an extreme amount of mental flexibility so that he may be able not only to discern quickly the type of personality with which he has to deal but also to put his questions in a way best suited to that personality.

Having considered the three main objectives to be achieved in eliciting a clinical history, let us consider methods by which their attainment is made possible. The assault on any clinical problem can be carried out advantageously in three stages, preferably in the following order: first, eliciting the patient's major complaint and all data pertinent thereto, jotting down notes concerning the significant facts; second, examining the patient while inquiring concerning symptoms referable to all parts of the body other than those discussed in the major complaint; third, composing the clinical history and recording it together with physical observations. These stages will be discussed in the order noted.

FOUR IMPORTANT QUESTIONS

The manner of the physician's approach to patients is of great importance. His attitude should be kindly, disarming, gentle, sympathetic, unhurried, self confident but not arrogant, and free from any trace of brusqueness. He should not make a mental diagnosis of their ailments immediately on meeting them, for they are quick to sense and resent a physician's preconceived ideas about their

symptoms. The physician's approach may inspire patients with confidence and put them completely at ease, or it may arouse a combative spirit which may result in a mental barrier between them and himself that cannot easily be broken down. Kilgore¹ summarized the problem well when he stated that the physician's approach should be intellectual rather than mechanical.

THE FIRST QUESTION

Physicians have various ways of putting their first question to patients. Introductory inquiries commonly employed are "Why do you come to me for an examination?" "What bothers you?" In my experience these questions not infrequently result in one of the following replies: "To find out what's wrong with me"; "That's what I came to you to find out," or "That's what I'd like to know." I prefer an initial question which gives patients no option in replying but to give the information desired. My favorite is "In what way have you been suffering that made you decide to seek medical counsel?" The question "Of what do you complain?" also may persuade the patient to relate significant symptoms. Next, one should ascertain the duration of the major complaint. If it is of considerable duration, an important follow-up question is "What made you decide to come just now?" This often yields most useful information so far as getting the proper perspective of the problem as a whole is concerned. For example, a patient gives pain in the precordial area of two years' duration as a major complaint, but the factor that crystallized his decision to come for an examination when he did come was that his family physician had recommended it because of his diagnosis of angina pectoris. Another patient gives as his major complaint attacks of epigastric pain of fifteen years' duration which are characteristic of the pain of duodenal ulcer, but the factor that crystallized his decision to go to the physician when he did go was a gastrointestinal hemorrhage four weeks previously. Another patient comes when he did because his symptoms had been getting progressively worse, another simply because it was a convenient time to get away from his work and not because of any recent change in symptomatology. Yet another patient gives constant pain in the lower part of the back following a blow in that region five years previously as a major complaint, but the threat of discontinuance of compensation may have crystallized his decision to come, although he won't give this information without tactful questioning.

Another fact which should be established early in the process of eliciting a clinical history in order that the symptoms may be evaluated

properly is whether or not there has been any disability. A patient may complain bitterly of pain, yet when asked if it keeps him from work he may admit that he does work in spite of it. The question that I prefer is "How long have you been unable to carry on your usual activities because of your pain?" or because of whatever symptom it may be of which the patient chiefly complains.

Having established the patient's main complaint and its approximate duration, the factor that made him decide to seek medical counsel when he did seek it, and the presence or absence of disability, one should encourage the patient to describe his symptoms in detail in his own words. The factual data gathered thereby may or may not be of great value but the manner in which the patient relates his symptoms can be, and often is, of considerable diagnostic importance in separating functional from organic disease.

Ward² has stated that the greater the number of symptoms of which the patient complains and the more complete the details with which they are described and presented, the more likely is their origin to be neurotic. Stated in another way, the longer the clinical history, the greater the probability that the symptoms are of functional origin.

When patients describe their symptoms with hyperbolic adjectives, the importance and significance of symptoms so described are greatly lessened. Ward points out that the patient with an agonizing headache one day may have an excruciating abdominal pain one week later and in another week may have a terrible pain in the foot. It should be emphasized that patients with organic disease usually present their symptoms in a simple manner unembellished with superlative adjectives.

It is common knowledge that the patient who brings several sheets of paper on which he has recorded all his symptoms so that he will be sure not to forget any of them almost certainly is suffering from functional disease.

CHRONOLOGY

In order for a history to have diagnostic value, the symptoms must be detailed in chronologic order. This is of equal importance whether the symptoms are due to functional or to organic disease. Polak³ stated that sequence of symptoms makes diagnosis. J. B. Murphy⁴ wrote that, in 2,000 cases of appendicitis, sequence of symptoms gave positive diagnosis in 1,998. For example, a woman 24 years of age presented as a major complaint jaundice of two years' duration. Inquiry as to sequence of events

1. Kilgore, E. S.: *Clinical Records: A Criticism of the Present Vogue*, J. A. M. A. 97: 93-95 (July 11) 1931.

2. Ward, Ernest: *Clinical Histories*, Clin. J. 65: 338-345 (Aug) 1936.

3. Quoted by Nix, J. T.: *How Can Scientific Clinical Records Be Assured?* Bull. Am. Coll. Surgeons 16: 19-22 (June) 1932.

disclosed the following facts: Beginning two and a half years before, and recurring on the average of two to three times a month, the patient had had typical attacks of gallstone colic. After enduring these spells for six months, the patient submitted to cholecystectomy. There had been no jaundice before the operation. Three weeks postoperatively, when the T tube was removed, jaundice associated with chills and fever gradually developed. The chills and fever continued for only one to two weeks but the patient remained intensely jaundiced, passing bile stained urine and acholic stools. Six weeks previous to her present examination, profuse epistaxis had occurred, following which she was given a blood transfusion. The order in which her symptoms developed suggested that her jaundice was of the obstructive type, most likely secondary to a stricture of the common bile duct. This diagnosis was confirmed when exploratory operation was performed.

QUESTIONS ABOUT PREVIOUS EVENTS

If the symptoms are due to functional disease, the physician should inquire carefully into the events leading up to their development. For example, a woman may develop weakness of one arm after eighteen months of caring for an invalid mother who is suffering from a stroke. A man may develop symptoms of functional indigestion after reporting to his business associate's apartment for Sunday morning breakfast and discovering that his partner has just shot himself. Another man may complain of trouble using his right arm after filling out complicated sales-order sheets for fifteen years without having had a vacation during that time.

With such problems it is a simple matter to describe the patient's symptoms, and the physician taking the history may even suspect that the symptoms are functional; but to find out the facts recorded above, which antedate the development of the symptoms themselves and are directly related to them etiologically, requires much tact and mental ingenuity. One must have a low threshold of suspicion for functional disease and, if there are features about the symptoms that are not typical of organic disease, one must attempt to find out the factors likely to be responsible for the symptoms.

Kilgore has described a case that emphasizes this point in a striking way. The patient was a woman 45 years of age who always had enjoyed the best of health until the death of her husband one year previously. She looked hopefully to her eldest son for support, but nine months after her husband's death she gradually experienced the final and crushing conviction that the son's talents were limited to selling newspapers at a

profit of less than a dollar a day. Therefore, in addition to caring for her home and her three other children, she took employment in a restaurant, where she stood eight hours daily washing dishes. Then came backache, sleepless nights of worry, anorexia, loss of 20 pounds, nervousness, utter exhaustion and hospitalization.

It took Kilgore five minutes of conversation with the patient to get this information, yet what did he find when he examined her aluminum encased hospital record? Five and a half pages of closely written matter comprised under twenty-eight captions, all neatly underlined with red ink. He toiled in vain through the history for bits of useful information. The marital history yielded the information that the woman had four children but contained nothing about the fiasco of her eldest son. Kilgore summarized by stating that this is a gross example of unrestrained standardization, stereotypism and perfunctoriness in history taking. It does bring forcibly to attention the importance of delving into the background of the patient's complaint and establishing in chronologic order the events leading up to it.

In making his complaint to the physician the patient may be prone to present bizarre and indefinite symptoms along with clinically significant factual data. It must be realized that the average patient knows little or nothing about things medical and that his answer to questions may unintentionally be misleading. It is the difficult but important duty of the physician to analyze each complaint carefully, so that any suspicion of organic disease as a cause of each symptom can be excluded or confirmed. Salzstein¹ summarized the task well when he stated that a physician must be able to extract from the wandering, worried, frequently uneducated and unclassified impressions of a patient a cleancut story without bias and free from leading inquiry. Stewart² stated that he thinks of a physician as an attorney who is collecting evidence and examining a witness. He must not take what is given him but must hunt for what he needs, sifting the essential story out of a mass of fiction and extraneous fact. Cavanaugh³ stated that the art of selecting important data makes the diagnosis of a difficult case a clear and easy process.

PHYSICAL EXAMINATION

When the major complaint has been analyzed thoroughly and notes have been made concerning factual data obtained, or when it

1. Salzstein, H. C.: *The Art of Medical History Taking*, J. Michigan M. Soc. 34: 762-766 (Dec.) 1935.

2. Stewart, D. A.: *Medical Histories and History Writing*, with Special Reference to Tuberculosis, Wisconsin M. J. 30: 257-260 (April) 1931.

3. Cavanaugh, J. A.: *Why Histories?* Illinois M. J. 72: 143-145 (Aug.) 1937.

becomes apparent that the patient complains of many conditions, the physical examination should be started. While the physician is examining the patient, he should ask specific questions regarding symptoms referable to every part of the body. If the questions are properly put, a denial of symptoms referable to together with normal physical phenomena concerning the part in question should exclude organic disease reasonably well. If an answer is doubtful, the physician must analyze the symptom carefully to determine whether or not it is of clinical significance. It must not be forgotten that patients whose major distressing symptoms are due to functional disease may also have organic disease and that the symptoms of the latter may be elicited only by careful direct questioning.

Examining a patient before composing and recording his history enables one to evaluate more accurately symptoms the significance of which may have been obscure before the examination. It also enables one to give each symptom of which the patient may complain a place in the history corresponding to and commensurate with its diagnostic importance and to correlate or demonstrate absence of correlation between the symptoms and the conditions found.

The value of a clinical history and the ease with which it can be elicited vary with different types of patients. Dunn⁷ pointed out that the variation in the consistency of answers given by a patient may depend somewhat on his mental or physical condition as well as on who puts the question and how it is put. He adds that it is essential for the physician to be able to frame and expand questions so that they produce correct and fruitful answers.

I have chosen to divide into four main groups patients whose histories may be particularly difficult and time consuming to elicit. It should be helpful to consider the difficulties presented by each group, and methods by which these difficulties can be surmounted.

FOUR DIFFICULT GROUPS

Foreigners who can speak little or no English constitute the first group. When a physician has the problem of such a patient to solve on a busy day, the temptation may be to spend little time attempting to get the history and proceed with the physical examination. This method is likely to lead to diagnostic inaccuracies. There is just one way that I know of to do justice to the problem of such a patient, and that is to take the history through an interpreter, spending as much time as may be necessary to analyze and evaluate the patient's complaint.

Poor observers constitute the second group. This includes individuals of stolid temperament who usually do not consult the physician until they are disabled by their illness. Often they remember little if anything concerning symptoms antedating the incident leading to their disability. For example, a man came for examination because of a recent gastrointestinal hemorrhage. On direct questioning he was unable to give symptoms suggesting duodenal ulcer, gallbladder colic or other organic disease of the gastrointestinal system, yet at exploration he was found to have not only a duodenal ulcer but also subacute cholecystitis with cholelithiasis. Another man came because, for one week, he had been vomiting almost everything that he ate. He was a farmer, had always worked hard up to one week prior to his examination, and on direct questioning remembered only vaguely some mild indigestion of about thirty years' duration about which he had never done anything. At exploration a chronic duodenal ulcer with almost complete pyloric obstruction was found.

STOLID INDIVIDUALS

In attempting to elicit a history from this type of individual the physician may feel slightly irritated because, although he may be certain that the patient has organic disease and that he should have had symptoms antedating his disability, the patient answers all his direct questions negatively. However, if the physician recognizes the existence of this group of stolid individuals who do not complain until they are practically disabled, he will not be impatient with them for being unable to remember symptoms that they have not felt because of their phlegmatic, insensitive nervous systems.

The value of the history of such patients will be less than that of the average individual, and one may be compelled to rely more on the physical examination and especially laboratory studies in arriving at a diagnosis.

Multiple complainers, many of whom are elderly, constitute the third group. These patients usually are very talkative and may be even garrulous. They may begin their story in a modest way, but as they sense the physician's increasing interest and sympathy the number of complaints increases until every part of the body may become involved. If subjected to direct questioning, every inquiry may be answered affirmatively. They seem fearful of forgetting to mention some detail which usually is of no consequence. They often come to the physician mainly to be sure that no serious disease is developing insidiously. When asked if they are unable to carry on their usual activities on account of the conditions of which they complain, they state that they have to keep going in spite of their difficulties or they say that

7. Dunn, H. L.: Practical Experiments in What Actually Constitutes a Good Clinical Record, *Minnesota Med.* 17:589-591 (Oct.) 1931.

they shouldn't stay up and around but they do keep going by sheer will power. Conditions of which such patients complain often have been of long duration. When asked what crystallized their decision to come just when they did, they may reply "Because I had a chance to come with a friend; because my local physician could find nothing wrong with me and suggested that I come for your opinion; because my husband got tired of hearing me complain."

As soon as a physician discovers that he has a patient of this type, he should proceed at once to the physical examination. It is said that Sir Jonathan Hutchinson⁸ would always hastily thrust a thermometer into the mouth of any woman who attempted to tell him about her illness. However, I believe that these patients are better pleased if allowed to tell their story. Examining them while they talk, the physician not only can save much time but also better evaluate such complaints.

Patients of this type usually are pleased at the conclusion of their examination if they can be assured that no organic disease is present and their symptoms can be explained adequately on the basis of a hypersensitive nervous system secondary to nervous exhaustion or cerebral arteriosclerosis.

VAGUE COMPLAINTS

Vague complainers constitute the fourth group. This includes a large group of patients who often present only one major symptom. Their description of this symptom, however, is usually bizarre, meager and not characteristic of any clinical syndrome. In attempting to get what they consider an unbiased opinion, or simply on account of prudery, they may withhold information that might enable the physician immediately to get the proper perspective of the problem. It is of great importance for the physician to find out all the factors which may be behind such a complaint and this can be accomplished only by tactful inquiry. Let us consider some of the factors which crystallize a patient's decision to come to a physician with such a complaint:

Fear of disease often is the real problem behind a vague complaint, although patients rarely will admit it without direct questioning. I usually put the question like this: "Do you seek medical counsel because of the intensity of your distress or mainly because of fear of what might be developing?"

Undisabling, more or less constant soreness or pain, not infrequently of long duration, is probably the most common symptom associated with fear of disease. For example, the basic problem of a patient with a major complaint of such pain in the head may be fear of a stroke

or brain tumor. If the pain is in the chest, the fear may be of heart disease; if in the breast, of cancer, and if in the abdomen, of appendicitis. The patient often develops his fear complex after the death of a relative or friend has been caused by the disease feared.

A desire to have the diagnosis of another physician verified is also a factor commonly behind a vague complaint. Patients who come for examination with this objective can be divided into two groups: those who do not disclose the real objective of their examination unless a direct question regarding the diagnosis elsewhere is put to them, and those who name the diagnosis given elsewhere in citing their complaint. Patients of either group present difficulties for the physician in his efforts to elicit pertinent clinical data.

The objective of a patient who comes to a physician to have a diagnosis given elsewhere verified, without disclosing this fact, should be suspected by the physician because of the non-descript nature of the complaint. When the physician's suspicion is aroused, he should ask the patient if he has had examinations elsewhere and, if so, what diagnoses were given him. If a patient has an examination just to check on a diagnosis given elsewhere, it is of the utmost importance to the physician to know what this diagnosis was, so that special attention can be given this problem in planning the examination.

For example, the real objective of a patient with a bizarre pain in the right upper part of the abdomen may be to secure verification of a diagnosis of tuberculous right kidney given elsewhere. He may disclose no urologic symptoms, and there may be neither physical nor laboratory evidence warranting urologic investigation. If the physician did not find out about this diagnosis given elsewhere, the patient would not be able to get a satisfactory opinion concerning his major problem.

PATIENTS WITHHOLD INFORMATION

Some patients purposely withhold pertinent information and the physician must be quick to sense this. I remember a middle aged woman who gave a history that immediately suggested the diagnosis of uterine leiomyoma, and the physical examination confirmed this diagnosis. However, there was something about the way she related her symptoms which suggested that she might be withholding some information. When questioned as to why she had come for examination just when she did come and what her local physician's diagnosis had been, she stated frankly that he had told her a few days previously that she had a cancer of the sigmoid colon and she came to find out about it. Proctoscopic examination disclosed the presence of a rectosigmoid carcinoma, although she com-

8. Hutchinson, Jonathan, quoted by Ward.²

plained of no symptoms that could not be attributed to her large uterine leiomyomas.

With the patient who cites the diagnosis given elsewhere as his main complaint, the physician's major problem is to elicit if possible from the patient the symptoms on the basis of which this diagnosis was made. For example, the patient may complain of an "infected kidney." The physician should ask "Of what symptoms were you complaining or in what way were you suffering at the time you saw your physician when this diagnosis was made?" He may find out that the patient's urinary symptoms started several months before, that the patient had no urinary symptoms for the past six weeks and that his real objective was now to determine the present status of renal function.

Often it is very difficult to elicit a recital of the symptoms and disability caused by the alleged disease without irritating the patient. Especially is this task difficult if a patient has been to several different physicians who have given conflicting opinions. If the physician's attitude bespeaks incredulity, the patient is likely to be antagonized; whereas, if his attitude bespeaks kindness and sympathy, the patient is likely to disclose willingly the symptoms that led his physician at home to incriminate various organs.

MENTAL DISEASE

Another problem, not infrequently the basis of a vague complaint, is mental disease. The physician may have to talk to the patient for a long time before he can get a clue, in the form of a delusion, as to what the problem really is. Strangely enough, the relative who accompanies the patient often will not disclose the delusional state of the patient, even if he is aware of it, but chooses rather to have the physician find it out for himself if he can.

One good way to get at such a problem is to ask the patient if he came for an examination of his own accord or simply because his relatives wanted him to have an examination. If the latter is his answer, the possibility of mental disease as a cause of the symptoms is a reasonable suspicion.

Not long ago I saw a patient whose main complaint was that she could not eat. Her sister had brought her almost by force, for the examination. The patient was sure that she would not be helped. She seemed unable to explain just why she could not eat. She would not partake of all of the Ewald test meal and refused to swallow the Rehfuß tube. The sister was asked to leave the consultation room and the patient was questioned further, especially as to why she was not able to eat all of the Ewald meal. She stated that she could not get rid of it if she did. When asked to elucidate further she stated that she had neither kidneys nor stomach and that therefore there was no

way for the food and water to be eliminated. She also thought that many other organs had wasted away. Her sister was fully aware of this delusional state yet did not reveal the fact, else my problem would have been greatly simplified. The physician always should keep in mind the possibility of mental disease as the explanation of a vague complaint.

SUGGESTIONS ON COMPOSING HISTORIES

If the methods described have been employed in eliciting a patient's complaint, the task of composing and recording the data obtained, in the form of a clinical history which has diagnostic value, is not difficult. However, there are a few suggestions concerning the composing and recording of histories which, if followed, will increase their value appreciably:

Keep irrelevant data out of the history so that its length can be kept at a minimum. Often, because of previous instruction in medical school, the recently graduated physician is inclined to record accurately every symptom of which the patient complains instead of analyzing each symptom to determine whether or not the patient actually is suffering from it. For example, the patient may state that he is short of breath on physical exertion yet analysis of this complaint may reveal that he can do the same things that the average individual of his age and weight can do without getting short of breath. Salzstein stated that two or three closely written pages of variegated complaints may represent much effort but do not necessarily indicate completeness or accuracy and probably do not permit logical deductions. Stewart emphasized the importance of separating rigidly fact from the patient's fanciful explanation of fact, or even one's own. Distinguish clearly between what he did have, what he said he had, and what his attending physician said he had in that obscure illness twenty years ago. Stewart added that a disorderly jumble of what the patient said is fit only for the wastebasket. The data that the patient gives should be used, but the physician should analyze and edit it before incorporating it in the clinical history. Remember that the completed history is the physician's workmanship and not the patient's.

When the physician has to deal with a multiple complainer whose symptoms are entirely functional, the history should deal mainly with the events leading up to their development, and the various complaints themselves should simply be enumerated. There is no diagnostic value in the recorded analysis of thirteen complaints each of which is of neurogenic origin.

Finally, after the history has been composed and recorded, forgetting if possible the difficulty with which it was elicited, one should read it over carefully before making a tentative diag-

nosis. The arduousness of its elicitation in some cases may leave a stronger impression than the factual data themselves and thus may lead the physician to erroneous conclusions if he does not reconsider the data in the history before summarizing his impression of the case.

CONCLUSIONS

1. In eliciting a clinical history the physician should achieve three main objectives: He must acquire pertinent clinical data that will lead to a correct diagnosis; he must perform the task with as much speed as possible; he must strive to please each patient.

2. In order that the physician may get the proper evaluation and perspective of a patient's problem, the following four points should be

established early in the process of eliciting a clinical history: the major complaint, its duration, what crystallized the patient's decision to undergo the examination just when he did, and whether or not the condition concerning which the major complaint is made has disabled the patient.

3. Patients whose histories may be particularly difficult and time consuming to elicit can be divided into the following four groups: foreigners who speak little or no English, poor observers, multiple complainers and vague complainers.

4. The fundamental problem of a vague complainer often is one of the following: fear of disease, a desire to obtain verification of a diagnosis given elsewhere, and mental disease.

Comments and Reviews

THE ROAD OF THE MEDICINE MAN

Abridgment of the Convocation Address, delivered by Dr. Albert E. Rector, President, State Medical Society of Wisconsin, at Marquette University School of Medicine, Milwaukee, Sept. 26, 1938, and published in the Marquette Medical Review, January 1939.

From an experience of forty-five years in our profession, I hope to make some observations that may be helpful to you. The example of three practitioners of medicine inspired me to enter this field, none of whom accumulated financial independence or ever performed an appendectomy or a tonsillectomy. They lived their professional lives in the same community and received its approval of their services. Your educational advantages make opportunities for you never dreamed of in my student days.

Medicine has widely expanded so that you have the choice of many specialized practices. However, you must first broaden yourself in the general field of medicine. The really broad physician is the conscientious man in general practice who has learned the art of practice and become a teacher in the art of living. These acquired abilities often outrank even the science of medicine in meeting the needs of the public.

You should carry the marks of the educated, ethical man who adapts his personality to the people he serves. You must have the ability to be at ease in the different kinds of homes where you are called so that you may gain the patient's confidence and establish a friendly relationship that the family too may feel at ease during your visit. Your personality should leave in every patient and family contact something of pleasure that helps remove the worries of illness. A casual scientific contact cannot give all that the sick requires. You

must give something of yourself to patients other than professional advice. This is implied in the recent report of a committee of the State Medical Society of Wisconsin appointed to study health service:

The committee feels that the very nature of professional education today tends toward producing physicians who are so engrossed in the technical and scientific phases of medicine that they may lose the human touch. There are no untouchables in disease, and there must be none in medicine. The role of the family physician as the friendly counselor, adviser, and even in that little considered but all important field of encouraging both patient and family, is of extreme importance. Attention is directed to this necessary quality, for, should it be lost, the practitioner will divorce himself from the obligation of the true physician for which the demand and need are as great today as at any time in history.

Some of the qualifications of the family physician are:

1. He must have scientific training and the ability to apply practical knowledge.

2. He must have an earnest desire for advancement in his profession. He must be associated with the local medical society.

3. He should show an interest in community affairs.

4. He must be honest, a man of religion, must not criticize professional associates and should reserve his criticism of scientific subjects for medical meetings and scientific publications.

5. He must subordinate monetary gain to scientific advancement.

With these qualifications he will be able to care for 80 per cent of his community's sick and also do public health work.

Have pride in your work. Your patients will respect the end results on about the same basis as you render your own personal judgment.

They appraise your worth and make keen deductions of your ability.

The public should be made more aware of the implications that are being forced on them by sociologists and governments. You must watch with care the economics of your vocation. Medicine is not a commodity that can be sold. It is a service to protect the public health and care for the sick. In countries where the control of medicine has passed into the hands of government and lay directors, there is a rise in disease in proportion to this domination.

The State Medical Society of Wisconsin from time to time places its seal of approval on doctors who have given meritorious service. This emblem has been given to a few physicians not because of their scientific attainments but because of their devoted service. The emblem has been given to one woman, a country doctor all her life and for thirty-six years secretary to her county medical society. It has been given to a member of the profession present with us today for service to medicine in teaching and training others.

EFFICIENCY OF MEDICAL SERVICE

In the controversy now before the public relative to the type and method of delivery of medical service, I challenge critics to compare the efficiency of all other vocations with that of American medicine. The medical profession has advanced scientifically and has increased its public health efficiency and cooperation with both local and state governments. It has cared for the sick when the family failed, when charity failed, when local, state and federal governments failed in their duty to the unfortunates who were justly their wards. It has delivered a better type of medical care than was furnished by the government in such other types of necessities as food, shelter and clothing, and with less noise and less complaint, and largely with little or no remuneration. The medical profession during the last ten years has been the second largest contributor to medical needs, being surpassed thus only by the federal government. It has contributed, according to conservative studies, \$1,000,000 a day during the past seven or eight years. When you compare thus our powerful government, and the medical profession with only 150,000 members in practice, this fact is beyond comprehension.

Disregarding these facts, the proponents of change insist on legislation to further socialize American medicine. The practice of medicine is not a commodity that can be resold at a profit. It is a service that can be delivered only by the properly trained individual.

Having entered the profession, you must dedicate your life to the service it alone can render.

AMERICAN RESPONSIBILITIES FOR THE UNIVERSITY

Abridgment of an address by Dr. Alan Gregg before the Federation of Societies for Experimental Biology, Toronto, April 28, and published in Science, June 23, 1939.

For sixteen years I have had occasion to visit medical schools and institutes of medical research in some thirty countries. In the variety thus encountered, one is reminded of a saying of Oscar Wilde: "When you break the little laws the big laws begin to operate," for out of so many contradictions and differing practices emerge certain underlying principles.

Now, I would like to ask, are we prepared in North America to assume responsibility for the maintenance and continuation of one of the greatest traditions of western Europe, the university? Are we free to select the best there is in the university tradition and cherish it?

An arresting story is told of the tercentenary of Harvard. In three separate instances European delegates to the tercentenary remarked privately to their friends: "I came to this celebration with a heavy heart. Our priceless heritage, the university, is in the gravest peril in Europe. But what I have seen here gives me hope again, for I have seen that it can go on in North America." To match this faith let us ask ourselves the question "Are we fully prepared to carry on if need be?" For that may be our greatest task in the next twenty years.

CHANGING ATTITUDE TOWARD EUROPEAN UNIVERSITIES

Before 1914 in North America we regarded the universities in Europe with earnest respect. Indeed there was admiration and the flattery of imitation. Many of our superior students sought and found in Europe intellectual habit—personal independence, intellectual method—thoroughness and the conviction that there was an opportunity for each to add to the scholarships of the world. Relationships almost filial in their devotion grew up between great teachers and eager Canadian and American disciples. And of peculiar importance and value there spread over our university life that wonderful openmindedness and unself-conscious receptivity which always characterizes ingenuous humility and true modesty. We weren't ashamed to learn nor afraid to try.

From 1914 to 1934 circumstances and attitude have changed. The flow of graduate students to Europe has much diminished. Europe has had less comparatively to offer: its university facilities often seem niggardly, its professors overloaded and impoverished. Confidence and leadership are not in the air. On this side of the Atlantic, university buildings, facilities,

endowments and teaching loads have increased. We have made some substantial additions to the world's store of knowledge. Of all that is worth attention in the European universities we may have accepted only a part, and of what we have accepted only a part in turn may survive. Higher education in North America has grown in an environment peculiar and at variance with the European milieu. The position of the intellectual in Europe may be affected by the fact that in every European capital there is a great university. In America the political capital is not the place of a great university.

CHARACTERISTICS OF AMERICAN UNIVERSITIES

Another characteristic in the North American scene: Underlying higher education here we have forms of secondary education which prepare our students for advanced work in the universities less adequately than their analogies in Europe. For their objectives and for society generally our secondary schools may do a passable job, but for the purposes of the university the secondary schools in America leave much to be desired. One of the reasons must be the relative absence of family ambition and pressure on young people of the secondary school age. On the suburban train out from Paris I used to see a French father and his young son, who used that precious twenty-five minutes in a regular and earnest lesson in English. Later in a similar commuter's train out of New York I saw one time a similar father and son, and this time the father was reading the stock reports and the boy was reading the "funnies."

Historically, our universities grew out of the colleges. The colleges were in the main sectarian enterprises to produce teachers and preachers. There was more pressure for the graduates, teachers and preachers to be numerous than to be excellent, and this pressure had also a flavor of sectarian competition, and so grew up the tradition that the college professor's moral and religious duty was to teach, and this well-nigh to the exclusion of scholarship and participation in self government or associate living. In some of the colleges today there is a measure of sectarian stubbornness, narrowness and pretension which knows no better standard for self comparison than the record of some nearby rival.

DILUTION OF SCHOLARSHIP

Add to this preoccupation with the teaching load the aura of political and social approval expressed in the phrase "equality of opportunity" and the staggering mass of poorly prepared students which have been crowding the colleges and universities and you have a dilution of scholarship which is no better than edema. It will "pit on pressure." As in planting trees too close together, the equality of opportunity is not as important as the nature of the

opportunity and relief from unreasonable circumstances. Our universities have accepted so huge a burden of teaching that there is a serious discrepancy in many institutions between the tacit understandings on the campus and the explicit claims and purposes in the catalogs.

TESTS OF A UNIVERSITY

There is a better test than numbers, than equality of opportunity, than the moral duty of teaching. We should rather judge a university or indeed any form of human association by what kind of a life it permits, encourages and rewards. We are flooded by students, by poorly prepared students. We encourage them by our methods, and our tradition of being teachers foremost has accustomed us to being preoccupied with what we are really giving the students. We are sentimental about it. We give till it hurts—till it hurts the student. We should be more preoccupied with the social and intellectual climate created by the university—a social and intellectual climate in which the creative powers of scholars will flourish. The Scandinavians, when they build a laboratory, provide specifically a room or two for the emeritus professor. What a wise understanding of what retirement could mean! I do not retire at 65, nor does the counsel and contact with men above that age cease to be valuable to me. There should be more appreciation of the concept of the university as a place where any person's genius for the scholarly life is cherished. The system of dining in hall in the English university has something we can't capture in hurried cafeteria lunches at the Faculty Club. There is a leisureliness and an equality among fellows dining in a hall which enables them to estimate and experience one another as human beings. That is precious. How soon will we realize that we could pay more attention to each other and thus to the example we set our students?

THE OLD WORLD'S INTEREST IN QUALITY

Equality is the best condition for securing freedom, and whatever helps to make your colleague feel himself your equal is precious to him and to you and to the life of the university. The judicial mind, self criticism, the readiness to discuss and dispute without dogmatism—and then tolerance, dignity and fair play—all these are exquisitely desirable in order that freedom and variety be given a chance to prove their value. Such a theory of the élite and of equality can be conveyed only by example and experience—lectures, books, exhortations and speeches are quite useless. I miss the Old World's interest in quality—and their grave expectations of what an élite may be relied on to do. We take, compared with Europeans, a motherly interest in their difficulties instead of a fatherly

interest in their trials of strength. We reward the élite with distrust and a heavy routine instead of with freedom, expectation and responsibility. Not long ago a French scholar with no university connections wrote three excellent books in the field of medieval history. In recognition of his ability he was offered a professorship at the Collège de France. He accepted. He called on a colleague in the college to learn a little more of what might be expected of him. After an hour of inconsequential talk he got down to his main inquiry. "Tell me," he said, "what are my duties at the Collège de France?" The reply was "Ask the janitor. He knows when the rooms are heated, lighted and available. For it is the tradition at the Collège de France to select persons who know how to lead in their fields better than any one else can tell them, and we leave that problem to the men to solve as they see fit."

DIGNITY OF SCHOLAR'S POSITION ABROAD

Now such confidence in superior human beings involves a respect for the individual and a naturalism that are remote from the lire-and-fire atmosphere pervading the college and many a university preoccupied with teaching schedules and processing the student. The professor abroad is selected with more deliberate and thorough discrimination than is yet the common tradition here, and then rewarded with a greater measure of confidence. There is a certain dignity in the scholar's position in Europe; it gives us all pause. I think it derives from the stability of his situation. What have we in North America to link the university to society in general, to allow occasional but thorough contemporary evaluation of the universities' work? What are the means of responsible criticism by society at large? The university president? The public relations vice president or office? The alumni? The regents or trustees? If you doubt the importance of the effect of society on the university, think of the danger that lay in the German universities being so close to the government. The professors were in most cases government employees, and when a political group seized the power of the government the professors were included among the newly acquired possessions. We need further reflection on the ways in which society can wisely criticize the university and ways in which the university could sense and in some cases implement such criticism.

SUMMARY

The North American scene is characterized by a cultural homogeneity that overwhelms dissent and puts protest on the defensive. Our universities are divorced from national policy and practical affairs, and this heightens a policy to emphasize learning by symbols rather than by experience and makes the word "academic"

an equivalent for "unpractical." Our secondary education is inadequate not for its own objectives but certainly so for the needs of the university. We overemphasize the importance of teaching and so rob the student of experience and of practice in the strategy of his existence. And, lastly, we have too many students, and this dilutes the quality of university experience for those best qualified to receive it.

I think experience in Europe would make you wish we had emphasis on the conception of the university as a place where a certain kind of living and example are best realized. You'd find a large measure in Europe of interest of the élite in their responsibilities, an interest in quality, be it ever so rare, and a respect for the individual—his vagaries as well as his excellences. You might come to see, as I have, that there are advantages in the measure of self direction and self management of the European universities and in the somewhat austere simplicity of the European scholar's life. You'd return reflecting on the significance of the university to society and the responsibility and reflective criticism each of the other. I have ventured to call attention to functions I should like to see more of if we in the universities are to be in part responsible for maintaining and cherishing delight in beauty, enjoyment of reason and joy in the skills of living.

STUDY OF APPLICANTS FOR ADMISSION TO 1938 FRESHMAN CLASS

Condensation of an article by Fred C. Zapffe, M.D., published in the July 1939 issue of the Journal of the Association of American Medical Colleges.

The Commission on Medical Education in 1926 financed a study of applicants for admission to medical colleges of the United States. The last study made by this commission included the 1929 class. The Association of American Medical Colleges in 1932 decided that the study was to be resumed, and since then it has been one of the main activities of that association. This study provides data on the number of applicants each year who sought admission to medical colleges, how many were accepted or rejected with the reasons for rejection, and the number of applications made by individuals; it is also a means to detect fraud. While the number of applicants for admission to medical colleges has varied with the economic conditions of the country, the number of applications has steadily increased. Medical colleges on the whole are accepting fewer applicants, and those accepted are better prepared for the study of medicine. From 1933 to 1938 the number of applications had increased by about 6,500, although the number of applicants through these years remained about the same, 12,131 as against 12,128. The

number of single applicants (that is, those who make only one application), decreased nearly 20 per cent since 1933, while those who made more than one application (multiple applicants) increased about 20 per cent. It is easy to understand why the number of multiple applicants increased, but it is not easy to account for the decrease in the number of single applicants. Most medical colleges have accepted fewer students since 1934.

Women are making a greater effort to enter medicine. The number of women applicants since 1933 has increased by about 26 per cent, and the number of applications made by them has increased by 48 per cent. The acceptances for women applicants has decreased from 62.3 per cent in 1933 to 50 per cent in 1938. There was in this period an increase of nearly 100 per cent of "multiple" applicants, but the number of "single" women applicants was practically the same in 1938 as it was in 1933. The number of women medical students is not increasing very much.

Only 6.6 per cent of the applicants for admission to medical colleges in 1938 had less than three years of college work and of that group 54.4 per cent were accepted. Twenty-four and a half per cent of the applicants for admission to medical colleges in 1938 had from three to four years of college work, and of this group 56.7 per cent were accepted. A hazardous group is the one comprising applicants who had been in college for four or more years but who had not received a degree. The study of student accomplishment shows that they do badly in medical school.

The rejection of applicants may be based on several points. The class may be full; a refusal of acceptance for this reason cannot be regarded against the applicant. The rejection may be based on inadequate credentials; about 3 per cent of all applicants fall into this classification. Rejection may be based on poor scholarship or personality; about 30 per cent of all applicants fall into this group. Some medical colleges accept only A and B students, while others accept as low as C students. Only two medical colleges require, with certain specifications, that

an applicant have a college degree for admission; three or four other medical colleges select only those who have a college degree. However, more than 60 per cent of the 1938-1939 freshman class of medical colleges in the United States had a degree, and only 4 per cent of them had less than three years of preparation.

Passing on applications is an enormous task for some medical schools. Seven colleges considered more than 1,000 applications, and one school considered 1,393, of which 214 were accepted. Some state schools will not consider an applicant who is a nonresident. One school accepts only applicants who are members of the religious group which operates the school. Fewer applicants were accepted in 1938 than in preceding years. The total number of applicants enrolled in the seventy-seven medical colleges in the United States in the fall of 1938 was 5,582, not including all repeaters. The total number of applicants accepted was 6,223; 541 accepted applicants did not matriculate.

MULTIPLE APPLICANTS

There were 5,882 multiple applicants, who made 30,000 applications, an average of six per applicant. More than ten applications were made by 590 applicants; one applicant made forty-three applications.

New York State, with about one tenth of the population in the United States, supplied 16.6 per cent of the applicants. Pennsylvania, with about one thirteenth of the total population, supplied about 8.5 per cent of the applicants. These two states, with about one sixth of the total population, supplied about 25 per cent of the applicants. Nineteen foreign countries were represented by fifty-five applicants for admission in 1938.

Judging by past experience, less than 5,000 of the freshman class in medical colleges will graduate; nearly 100 will not go further than the freshman year, many will fail and be dropped, some will find that they do not care for medicine, some will become too ill to continue, a very few will drop out to return to college and some will be unable to finance their medical education.

Correspondence

THE QUESTION CONCERNING ABORTIONS

To the Editor:—I was much interested in the Student Section in *THE JOURNAL*, November 25, and especially in the questionnaire on page 2005. Do these answers represent an average cross section of the opinions of the medical youth of today? The answer to question 18 shocked me. Perhaps I am an old timer, having been fifty years in the profession. My father also was a physician (Edinburgh 1856). He was taught and he taught me that any interference

with the course of pregnancy was nothing less than murder.

To think that, if legal, 68 per cent of the medical students of today would be willing to perform abortions on married or unmarried women, except after consultation and for pathologic reasons, speaks badly for the moral or religious ideals of these young people. In my opinion, the place to cure this condition is in the medical schools, which should lead their students in the right direction.

HENRY WALLACE, M.D., New York.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Full Tuition for Six Students

The anonymous gift made last year by a friend of Columbia University College of Physicians and Surgeons, New York, of full tuition for six students for the entire four year course has been repeated this year. Last year at Columbia ninety-one students were employed in steady positions as a means of helping themselves through school, while 136 students had temporary jobs. These figures were the highest since the opening of the employment file in the dean's office seven years ago. In fact, 44 per cent of the students had employment, 25 per cent received scholarships and 5 per cent received loans.

Tulane Juniors Awarded Plaque

A handsome plaque was awarded to the junior medical class at Tulane University of Louisiana School of Medicine, New Orleans, for winning the greatest number of points in intramural competition during the year 1938-1939. The class advanced to the semifinals in both basketball and softball and won the touch football championship. Among the principal players of the class were Harold R. Goldfarb, Harry C. Tiller, Jack Hyman, Henry C. Hudson and Arthur Grady Williams Jr.

Louisiana's *Tiger*—A Correction

For eight consecutive years, the medical students of Louisiana State University School of Medicine, New Orleans, have published a weekly paper known as *The Tiger*, Journal of the School of Medicine, Louisiana State University. The Student Section of THE JOURNAL, November 25, page 2011, erroneously credited *The Tiger* to Tulane University of Louisiana School of Medicine. *The Tiger* is, the editors believe, the only weekly paper in this country published by medical students. It has three principal objectives: (1) to cover all news happenings at the school of medicine and report other local and general medical news; (2) to publish scientific contributions from members of the faculty and student body, and (3) to promote various extracurricular activities such as intramural sports and chess tournaments. The staff of *The Tiger* is drawn entirely from the student body of Louisiana State University School of Medicine, with the exception of the medical editor (who serves as faculty adviser), the medical artist and the assistant medical artist.

Fees at Minnesota

The quarterly fee for the medical course at the University of Minnesota Medical School, Minneapolis, is \$75 for residents of Minnesota and \$125 for non-residents, payable at the beginning of each quarter. No fee is charged in the medical school for the final hospital or advanced laboratory (fifth) year. The registrar of the university determines the status of applicants as to residence.

Applicants who are not legal residents of Minnesota must pay an application fee of \$5 at the time of application. This will be credited to the tuition for the first quarter in the case of successful applicants but will not be refunded to those whose applications are rejected.

In addition, each student is charged an incidental fee of \$8.50 each quarter. Laboratory fees may be instituted or modified at any time by action of the board of regents.

A matriculation deposit of \$15 (\$5 for women students) is required, payable with the tuition of the first quarter in residence, as a guaranty for the return and protection of university materials and equipment, the remainder to be refunded on the student's withdrawal, failure to return for any succeeding quarter, or graduation.

Students who take less than the regular course of study may arrange their fees at the rate of \$3.25 (non-residents \$5.75) for each weekly clock hour per quarter.

Repetition of a course requires the payment of additional fees. A graduation fee of \$7.50 is charged for each degree conferred.

Late registration: The fee for the privilege of late registration, late change of registration or late payment of fees shall be \$2 prior to the day on which classes begin, on and after which the fee increases at the rate of \$1 a day, provided no student shall pay more than \$10 in fees for such privileges in any one quarter.

Prizes Offered at Minnesota

The Minneapolis Surgical Society offers a first prize of \$75 and a second prize of \$25 to those members of the senior class of the University of Minnesota Medical School, Minneapolis, or those serving the first year of their internships in Minneapolis hospitals who write the best papers in some field of clinical surgery. These papers must be in the hands of the secretary of the society in March.

The Southern Minnesota Medical Association offers an annual prize of \$100 and a medal to the most representative student or students in the senior class of the university. This award is made on the basis of the scholarship, extracurricular activity and character of the student, as well as on the general excellence of the thesis.

The Rollin E. Cutts Prize in Surgery is awarded in the form of a gold medal to that member of the senior class who presents the best thesis based on original work in a surgical subject.

Premedical Students Visit School

A group of forty-five premedical students in charge of their professor of physiology, J. H. Brownback of Ursinus College, Collegeville, Pa., visited Temple University School of Medicine, Philadelphia, November 30. They were shown about the laboratories and clinics by Dr. Morton J. Oppenheimer, assistant professor of physiology at Temple and an alumnus of Ursinus College.

The William Osler Society at Tufts

The William Osler Society, a student honor organization at Tufts College Medical School, Boston, has announced the names of the following newly appointed members from the fourth year class: Harvey Katz, Gertrude A. Rogers, Elmer L. Grimes and Emil J. Koenig Jr.; from the third year class: Carroll Bryant Jr., George A. Dodge II, Clement S. Dwyer, Herbert F. Hager, Robert S. Hagen, Alfred Kant and Arthur N. Kelly.

Scholarships and Prizes at University of Oregon

At the University of Oregon Medical School, Portland, the Noble Wiley Jones Pathology Research Fellowship, consisting of the interest on \$5,000, is awarded annually to a medical student on the basis of scholastic

ability, training in pathology and interest in the work. The Henry Waldo Coe Prize is awarded annually to a second, third or fourth year student who presents an essay on a medical subject exhibiting superiority and originality in composition. This prize is the interest on \$1,000. The Pohl Memorial Fellowship is awarded to a student of promise in the field of medicine. With authorization from the legislature, the state board of higher education awards annually a number of scholarships to students in the institutions of the state system who rank high in scholastic attainment and need financial assistance. These scholarships cover tuition. The recipients must pay the building fee, the matriculation fee and special fees. Application should be sent to the dean's office not later than May 15.

Indiana Interns Appointed

All of the 102 members of the last graduating class of Indiana University School of Medicine, Indianapolis, who applied for internships received appointments. The two graduates who did not make applications for internships had other plans. Sixty-four of the recent graduates will remain in Indianapolis for their internships, and eleven will intern in hospitals in Muncie, South Bend, Terre Haute, Lafayette and Hammond. The other twenty-seven graduates will intern in hospitals in Ohio, Illinois, California, Colorado, Minnesota, Missouri, New York, Louisiana, Canada, Pennsylvania, Washington, New Jersey and Wisconsin.

The dean of Indiana University School of Medicine, Indianapolis, has announced that, among the twenty-eight recent graduates appointed to serve as interns in Indiana University Medical Center Hospitals in 1940-1941 will be the following six graduates from other states: O. Will Allison, Danville, Ill., Jefferson Medical College of Philadelphia; Maurice A. Canon, Amarillo, Texas, University of Texas Faculty of Medicine; John N. Carnes, Gallipolis, Ohio, Ohio State University College of Medicine; George P. Smith, Denver, University of Colorado School of Medicine; Dwain N. Walcher, Nokomis, Ill., University of Chicago, and Henry J. Winsauer, Kohler, Wis., University of Wisconsin Medical School.

Graduate Training for Residents at Columbia

A large number of residents in the hospitals affiliated with Columbia University College of Physicians and Surgeons, New York, last year took regular instruction in medical sciences in the graduate laboratories of the school or were otherwise engaged in work toward the degree of doctor of medical science. Some hospital residents received science instruction in various hospitals. As this program of graduate training evolves, an increasing number of residents will be enrolled. This program is independent of that of undergraduate students, but every effort is made to integrate the needs of both groups of students and to secure full coordination of the staffs of the clinical and scientific departments of the medical school. An effort is made to regard the residents as graduate students in the university sense. They are placed largely on their own responsibility for learning the subjects; instruction is by means of individual work, conferences, laboratory experiments, investigation of problems, seminars, and the reading of original articles. Clinical men on the staffs of the hospitals take part in the exercises and assist in laboratory instruction. No two services have the same arrangement and distribution of time. Some services require the residents to report ahead of the time of their appointment in order to obtain the instruction offered in the medical sciences; others believe that the most effective way of coordinating medical science instruction and clinical training

is to offer certain blocks of time for laboratory investigation throughout the residency period. In several instances the medical science training is provided in the evenings for convenience. Some of the residents taking basic science training who demonstrate special aptitude, preparation and interest desire to become candidates for the degree of doctor of medical science; however, only those appointed in one of the affiliated hospitals or those who have completed a satisfactory residency and wish to spend not less than one year in one of the medical sciences are eligible for registration for the degree.

Several of the hospital services at Columbia have been reorganized as an expression of the changing needs of graduate training. The surgical service of the Presbyterian Hospital, for example, has been placed entirely on a graduate basis, the surgical internship being eliminated and a mixed medical service of eighteen months being made a prerequisite for the surgical residency. Similar changes have been made at St. Luke's Hospital and are being contemplated at other affiliated institutions. In his report for the year ended last June 30, Dean Willard C. Rappleye anticipates that as modifications in the house staffs of these affiliated institutions are effected, in keeping with the current trend toward a rounded educational experience for their residents, the facilities for graduate training at the medical school will be further utilized.

The Ten Highest in Part I

Among the 1,047 candidates who took the examinations of the National Board of Medical Examiners in June in Part I or completed Part I by taking subjects previously postponed, the names of those who made the ten highest average grades, as reported in the *Diplomate*, are as follows:

NAME	MEDICAL SCHOOL	AVERAGE
Bertram Selverstone.....	Harvard '41.....	91.50
William G. Armstrong.....	Albany '41.....	90.50
George James.....	Yale '41.....	90.17
Robert W. Raymond.....	Albany '41.....	90.17
Ernest M. Hammes.....	Harvard '41.....	90.
Edward O'Connell.....	Yale '41.....	89.67
Craig W. Borden.....	Harvard '41.....	89.
H. W. Diefendorf.....	Yale '41.....	89.
Sheldon C. Sommers.....	Harvard '41.....	89.
Sidney Cramer.....	New York Med. College '41.....	88.83

The Ten Highest in Part II

Among the 224 candidates who took the examination of the National Board of Medical Examiners in June in part II, the names of those who made the ten highest average grades are as follows:

NAME	MEDICAL SCHOOL	AVERAGE
Frank H. Russ.....	McGill '39.....	88.40
Phyllis J. Burdon.....	Oregon '39.....	87.40
Lester M. Narins.....	Long Island '39.....	87.20
Debora Pineles.....	Medical College of Virginia '39..	86.40
Robert M. Smith.....	Harvard '38.....	86.20
William B. Stromme.....	Minnesota '40.....	85.80
Aaron Kellner.....	Chicago '39.....	85.60
Sam J. Merenda.....	St. Louis '39.....	85.40
Edmund J. Schmidt.....	Marquette '40.....	85.20
William G. Marcoux.....	Tufts '39.....	84.80

Students Invited to Clinical Meeting

Medical students in New Orleans were especially invited to attend a joint meeting of the New Orleans Gynecological and Obstetrical Society and the Mercy Hospital staff at Mercy Hospital December 6. The speakers were Drs. Max M. Green on infection of the upper urinary tract; Philips J. Carter on urethral caruncle; Rupert E. Arnell, Chicago, on granuloma venereum of the cervix, and William F. Guerriero, Monroe, La., on criteria for the management of toxemia of pregnancy.

Fees at Arkansas

According to the official announcement of the sixty-first annual session of the University of Arkansas School of Medicine, Little Rock, the total tuition and annual deposit fees for residents and nonresidents are \$275 and \$430, respectively, for each of the four year courses. There is also a diploma fee of \$10. This total does not include the breakage fee, which is fixed by each department. The building fee, which is included in these totals, was increased to \$75 for residents and \$80 for nonresidents, but this increase is not applicable to students who registered prior to 1937-1938. Students who fail to register and fail to pay fees on the dates named are required to pay \$5 additional. Students have the privilege of using an available locker by paying at the registrar's office \$1 rental. A fee of \$5 is to be paid at the time of registration by each student for the Student Activities Fund.

Orientation Lectures for Freshmen

The University of Georgia School of Medicine, Augusta, inaugurated this year a series of orientation lectures for the freshman class. The following lectures were given in this series: The Importance of the Humanities by Dr. George L. Kelly, dean; Philosophy in Every Day Life by Dr. Eugene E. Murphey, professor of clinical medicine; Heredity and Medicine by Dr. Joseph Krafka Jr., professor of microscopic anatomy; Ethics in Daily Life by Dr. Virgil P. Sydenstricker, professor of medicine; Environment and Adaptation by Dr. Hervey M. Cleckley, professor of psychiatry, and Science and Knowledge by Dr. Fred A. Mettler, professor of anatomy.

Prizes Awarded at Woman's Medical College

At the recent eighty-seventh annual commencement of the Woman's Medical College of Pennsylvania, Philadelphia, Isabel Roberts Roe received the John Stewart Rodman Prize for the member of the graduating class who made the best record in surgery; Isabella M. Schmitz-Dumont, the Anna Howard Shaw Prize of \$20 for her thesis "Prevention of Anesthetic Deaths"; Rita E. Scott, the Sarah Marchand Milligan Book Award for her thesis "Effect of Occupation on the Cardiovascular System"; Dorothy O. Dart, the Martha Tracy Book Award for her thesis "The World-Wide Problem of Malaria Control," and Barbara Harris, the Dr. Hubley R. Owen Prize for the best examination in junior surgery.

Oklahoma Personal

Jay E. McCormick, a graduate of the University of Oklahoma School of Medicine, Oklahoma City, gave a talk on his experiences in medical school at the annual banquet of Alpha Epsilon Delta honorary pre-medical fraternity at the University of Oklahoma.

The Charity Hospital Intern Corps

About 150 new junior interns at the Charity Hospital, New Orleans, representing medical schools throughout the United States, held a meeting to outline a program of activities for the year. The Junior Club Committee is obtaining speakers for a series of addresses to the interns. Another committee has prepared a short summary of majority opinion among the interns and presented it to the resident staff in an effort to round out the curriculum during the intern year. Dr. Richard Ellis Gardner has been elected president of the intern corps, and Dr. Jerome A. Weaver, secretary. The corps was addressed the evening of October 10 by Dr. Urban Maes, professor of surgery at the Louisiana State University Medical Center, New Orleans, on intestinal obstruction.

Recreation Room for Students

Washington University School of Medicine, St. Louis, has furnished, for the first time, a recreation room for students on the second floor of the Osear Johnson Institute. The room is furnished with comfortable chairs, card tables and a book shelf, and nearby are rest rooms and facilities for ping pong; the medical students are also permitted to use the handball and squash courts when they are not occupied by the interns at Barnes Hospital. These courts, on another floor, have showers and lockers available.

Scholarship at the University of Kansas

The Porter Scholarship is awarded to the student at the University of Kansas School of Medicine, Kansas City, who has the highest average class standing for the first three years. It is given in the fourth year and amounts to \$300.

Prizes Awarded Students at Jefferson

The following prizes were awarded by the dean, Dr. Henry K. Mohler, at the commencement of Jefferson Medical College of Philadelphia, June 2, 1939:

The Henry M. Phillips Prize of \$75 awarded on the recommendation of the professor of medicine to the graduate most worthy, to Fred S. Badman, with honorable mention of Furman Payne Covington.

The Henry M. Phillips Prize of \$75 awarded on the recommendation of the professors of surgery to the graduate, in their opinion, most worthy, to Louis Harry Schinfeld, with honorable mention of George Lewis Greaser.

A gold medal awarded for the best essay on a subject pertaining to the practice of medicine, to George Hollander.

A gold medal for the best essay on a subject pertaining to surgery, to Isadore Slovin.

By Professor Anspaeh, \$25 for the best examination and clinical report on gynecology, to Arnold Valenzuela Arms, with honorable mention of Isadore Slovin, Paul Fried and George Hollander.

By Professor Williams, \$25 for the best examination in ology, to Charles Hugh O'Donnell, with honorable mention of James Thomas Grimes.

A gold medal for general excellence in clinical surgery, in memory of Francis Torrens Stewart, to George Beverly Hood, with honorable mention of James Edward Cochran and John Joseph Barrett Kilker.

By Professor Vaux, \$25 for the best examination in obstetrics, to James Joseph Fitzpatrick, with honorable mention of George Beverly Hood and Arthur Robert Wertheim.

By Professor Rugh, \$25 to the member of the senior class presenting the best report of the clinics in orthopedic surgery, to William Joseph Wagner, with honorable mention of Paul Fried and Louis Harry Schinfeld.

By Professor Bauer, \$25 for the best examination in pediatrics, to George William Miller III.

By Professor Shannon, \$25 for the best examination in ophthalmology, to Joseph Medoff, with honorable mention of David Dennis Dunn and Daniel Geddie Monroe.

By Professor Clerf, \$25 for general excellence in laryngology and bronchoscopy, to Henry Herbert Stroud.

By Professor Alpers, \$25 for the best examination in neurology, to Henry Herbert Stroud.

By Clinical Professor Keyes, \$25 for the best examination in psychiatry, to Jack Ralph Wennersten.

A gold medal for the best examination in therapeutics, to Henry Herbert Stroud.

W. B. Saunders Company Prize. Seventy-five dollars' worth of their medical publications to the student who passes the best general examination at the end of the senior year, to John Dominick DePersio.

William Potter Memorial Prize, awarded to that graduate attaining the highest general average in the final two years of the medical course, to Henry Herbert Stroud.

By the Alumni Association, a medal for the best general average gained in the examinations for the entire curriculum, to Arthur Robert Wertheim.

Physiology Prize, a gold medal for the best essay, or the best examination, on a subject pertaining to physiology (open to undergraduates of the second year), to Charles Michael Gruber Jr.

A gold medal, awarded to the student who has the highest grade in the anatomic subjects of the freshman and sophomore years, to John Young Templeton III, with honorable mention of Frederick Balthas Wagner Jr. and Oliver Judson Kregar Jr.

D. Appleton-Century Company Prize. Fifty dollars' worth of their medical publications to the student who passes the best general examination at the end of the junior year, to Alan Murray Schaeffer.

Schaeffer Anatomic League Prize, a gold medal awarded to the member of the league presenting the best thesis in anatomy, to Frederick Balthas Wagner Jr., with honorable mention to George Francis Callett.

Aid for Students at University of Virginia

The University of Virginia Department of Medicine at Charlottesville maintains a personnel office for the benefit of students who wish to obtain employment. A new student should not attempt to attend the school unless he has resources to defray at least half of the expenses of the first session. Assurance of employment cannot be given until after the student's arrival at school. The university also has certain loan funds from which deserving students may obtain loans. There are also special scholarships open to medical students. The William A. Herndon Scholarships are awarded by the faculty after a competitive examination held during the summer. These scholarships carry a stipend of about \$500 and continue for four years of the medical course and are awarded to candidates unable to pay for their medical education who signify their intention of entering the medical services of the army or navy of the United States. Two appointments will be made in September 1942. The Richard Henry Whitehead Scholarships are awarded to promising male students who have finished at least two years of the medical course. New appointments to these three scholarships will be made for the session of 1939-1940. The two Henry Clay Marchant Scholarships with a stipend of \$360 each under certain stipulated conditions may be awarded to medical students who are preparing to be medical missionaries.

The stipend of the State Scholarships is the remission of \$100 of the tuition fee. The tenure is one year, but an incumbent may be reappointed each year for four years. The number of these scholarships awarded in any department in any year does not exceed 20 per cent of the enrolment of the undergraduate students from Virginia in any department in the preceding year.

In Honor of the Freshmen

The sophomore class at Temple University School of Medicine, Philadelphia, was host December 15 to the other classes at the annual dance given in honor of the freshmen, held in the auditorium of Mitten Hall. On this occasion, the freshmen were given the traditional medical school keys as favors.

Special Courses for Residents

The resident physicians at Charity Hospital, Touro Infirmary and the Eye, Ear, Nose and Throat Hospital, New Orleans, will have an opportunity for postgraduate study in ophthalmology in a two year course of seven months each, which opened Oct. 9, 1939. The course has been provided by both Tulane University of Louisiana School of Medicine and the Louisiana State University School of Medicine and is preparatory for the American Board of Ophthalmology. The didactic course has been divided into the following twelve sections, each of which will be given ten hours: (1) embryology and anatomy, (2) histopathology and the eye and orbit, (3) physiology of vision, psychology of vision, and physiologic optics, (4) refractions, (5) ocular motility, (6) external diseases of the eye, (7) ocular therapeutics, (8) ophthalmoscopy, (9) medical ophthalmology and clinical pathology, (10) neuro-ophthalmology and perimetry, (11) ophthalmic surgery: demonstration of cataract operation on cats' eyes, (12) diagnosis-examinations.

Indiana Personal

Dale E. York, of Bloomington, and Elbert Harold Laws, of Milan, seniors in the Indiana University School of Medicine, Indianapolis, have been appointed to internships in the Philadelphia General Hospital,

Philadelphia, in a competition with 150 applicants for thirty-five internships; they were two of six accepted from schools other than the University of Pennsylvania School of Medicine. The rotating internships will begin July 1, 1940.

Scholarships and Loans at Alabama

Among the prizes available to students at the University of Alabama School of Medicine, University, is the Phi Beta Pi medical fraternity annual scholarship of \$90, awarded each year to a worthy freshman matriculated by June 1. The award is made by a committee of professors to a man or woman who is in need of financial aid and whose previous scholastic record and other qualifications give promise of a successful career in medicine. The dean's prize, consisting of a set of Harvey Cushing's "Life of Sir William Osler," is awarded annually to a sophomore who in the opinion of the teachers of the sophomore class "gives promise of becoming the highest type of practitioner of medicine." The Joseph Henry Walker III Memorial Award of \$25 is given annually to a native Alabama student who after completing the first year gives promise of the most useful service in medical practice. This award is decided on by the senior teachers of the freshman class.

Prizes Available at Yale

Following are some of the prizes awarded to students at the Yale University School of Medicine, New Haven, Conn.:

The Campbell Gold Medal. Awarded to the student who secures the highest rank in the examinations of the course of diseases of women and children.

The Ferris Prize in Anatomy. Awarded to a first year student in the school of medicine who, in the opinion of the staff of the department of anatomy, merits recognition for the excellence of his work in dissection.

The Keese Prize. Awarded annually to the student who presents the best thesis.

The Parker Prize. Awarded annually to the graduating student who, during his course, has shown the best qualifications for a successful practitioner, the faculty to be the judges.

The Perkins Scholarship Prize. Awarded annually to the student making the best record in scholarship in the basic subjects of the medical and

The Ramsay Memorial Prize. Awarded annually to the student who has completed his first year in the department of clinical medicine.

Expenses at Alabama

For payment of fees at the University of Alabama School of Medicine the school year is divided into three fiscal terms, while for instruction the year is divided into two semesters. The tuition per fiscal term is \$30, the university fee per fiscal term \$16, the Student Activities Fee per fiscal term \$4.50, the laboratory fee per semester \$60 and the breakage and clinical deposit per semester \$20. The university fee covers registration, library, gymnasium, medical and incidental fees. The Student Activities Fee permits student membership in the athletic association and free admission to all intercollegiate contests on the campus in which the university team is one of the contestants and covers the subscription to the *Crimson-White*.

Students who are delinquent in paying their fees are required to pay a small additional sum. If the delay exceeds nine days a delinquent fee of \$5 is charged and, in addition, the president is required to cause the withdrawal of the student from the university unless a satisfactory explanation is given.

Table board for men varies from \$18.50 a month, if paid in advance, to \$25 a month with private families. Rooms in the quadrangle cost about \$6 a month, in Gorgas Hall \$7.50 and in the new dormitories, if two men occupy one room, from \$24 to \$30 a term, and with private families from \$7 to \$15.

Harvard Graduates' Internships

Following are a few of the graduates of the 1939 class of Harvard Medical School, Boston, who are serving internships at hospitals outside of New England: Dr. William M. McGaughey is serving a one year rotating internship at Mercy Hospital, Chicago; Dr. Joseph H. Phillips is serving a surgical internship at the Royal Victoria Hospital, Montreal; Dr. John F. Roach is serving a rotating internship in the United States Naval Hospital, Philadelphia; Dr. John A. Sims, a rotating internship at the Denver General Hospital, Denver, and Dr. Ernest H. Wood Jr. a rotating internship at the Philadelphia General Hospital, Philadelphia.

Scholarships and Fellowships at the University of Chicago

Seventy or more regular university fellowships are provided in all departments of the University of Chicago by appropriations from the general funds of the university. The university requires of holders of these fellowships a modicum of service to be done under the direction of the department in which the appointments are made. Such service may consist of assistance in reading and preparing examination papers, work on a university journal, or assistance in one of the departmental laboratories, libraries or museums; in no case is a fellow expected to devote so much time as to interfere seriously with his own particular studies.

In addition, there are several special and annual fellowships for advanced study in special fields. These appointments are made by the departments in which these honors are assigned and are usually to persons who have begun resident study. Among these fellowships are the Frank Billings Memorial Fellowship; the James B. Herrick Fellowship in Medicine; the Ernest E. Irons Fellowship in Medicine; the Wilber E. Post Fellowship in Medicine; the E. R. LeCount Fellowship in Pathology; the William H. Wilder Jr. Fellowship in Neurology; the Arno B. Luckhart Fellowship in Physiology; the Nicholas Senn Fellowship in Surgery; the E. Fletcher Ingals Jr. Fellowship in Laryngology and Otolaryngology; the Sydney Walker III Endowed Scholarship in Physiology, and various others. The Douglas Smith Foundation supplies funds to support various research projects in medicine, the fellowships awarded varying with the problems under investigation and the qualifications of the applicants. There are other scholarships available as well as special research funds and foundations, and endowed scholarships, information concerning which may be had on writing to the dean of students in the Division of Biological Sciences, Cobb Lecture Hall, room 216, University of Chicago.

Loan Funds at the University of Chicago

The University of Chicago publishes a special circular entitled "Awards and Aids," which gives details concerning all forms of aid to students and the routine methods of application for aid. This circular will be sent on request. Friends of the university have created loan funds to aid temporarily students of worth and promise. These funds are limited and are exhausted early in the academic year. There is also the Clara M. Coit Loan Fund for Medical Students, established to aid needy students who give promise of unusual service in medicine. Interest is charged at the rate of 4 per cent. Application should be made to the Dean of Medical Students. The Medical Students' Loan Fund, established by the Physicians Association of Cook County, is available for medical students, preferably Negroes, and is lent with interest at 4 per cent. Application should be made to the Dean of

Medical Students. The national fraternity, Alpha Epsilon Iota, has available a loan fund contributed by its members in memory of one of its members, Jane Darling Stevenson. The loans are restricted to women medical students in advanced classes. Further information about this fund may be obtained from the chairman of the national committee, Monica Donovan, M.D., 450 Sutter Street, San Francisco.

Michigan Personal

Among the new interns in the department of internal medicine at the University Hospital at Ann Arbor are Malcolm Block, William H. Bates and Sim P. Dimitroff, all of whom received their M.D. degrees from the University of Michigan School of Medicine, Ann Arbor, last June.

Expenses at North Carolina

The tuition and other fees for each quarter at the University of North Carolina School of Medicine, Chapel Hill, are (1) tuition and matriculation, \$88.34, including the fee for physical education, the library, infirmary service, debates, registration costs and membership in the athletic association; (2) student publications, \$2.30; (3) laundry deposit, \$8.50, and (4) student union fee, \$1, making a total for each quarter of \$100.14. Each student whose bona fide residence in North Carolina has not been established must pay an extra fee of \$33.34 for each fall, winter or spring quarter. Each student must provide himself with his own microscope. A deposit of \$10 is required for the first registration of the year to cover the cost of the materials purchased from the medical storeroom, and the balance left at the end of the college year will be refunded.

Board without room can be obtained in town for from \$22.50 to \$35 a month. The University Dining Hall Cafeteria serves food at such prices as will only meet necessary expenses.

Room rent in the university dormitories, including light, heat and service, ranges from \$5.50 to \$15 a month for each occupant. There is a new dormitory within a block of the medical building. All rooms are completely furnished, but students will provide their own pillows, bed linen for single beds, blankets and towels.

Wisconsin State Board Questions

The following questions in pediatrics were given at the examination held in Milwaukee, June 27-30, 1939, by the Wisconsin State Board of Medical Examiners:

(Answer six.)

1. Describe rubella:
 - (a) Give cause and diagnosis.
 - (b) Describe the five stages.
 - (c) What are its principal complications?
2. (a) Describe pertussis. Give cause, diagnosis; describe the various stages and treatment.
 - (b) Describe scarlet fever. Give diagnosis, cause, complications and treatment.
3. Differentiate between lobar and bronchial pneumonia in children, as to the onset and temperature curve. Give the prognosis and termination of the disease.
4. (a) Mention the important points in prevention and treatment of gonorrhea of the eye in infants.
 - (b) 1. Give the clinical features in the treatment of diphtheria.
 2. What preventive measures are recommended in transmission of the disease?
5. (a) Differentiate between scarlatina, measles and roseola.
 - (b) Differentiate between cerebrospinal meningitis and tuberculous meningitis in children.
6. (a) What are the symptoms of pyloric stenosis?
 - (b) Outline treatment and diet.
7. Describe the clinical, laboratory and x-ray findings of active rickets in infancy. Also treatment.

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RECENT ADVANCES IN THE MEDICAL TREATMENT OF PERIPHERAL VASCULAR DISEASES

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ROCHESTER, MINN.

Essential hypertension is a serious disease in the United States, accounting for perhaps twice as many deaths as cancer.¹ This condition has been entirely too much neglected by the medical profession for several reasons, which follow:

1. There is a belief that elevation of the blood pressure is a symptom and not a disease. What difference does it make, however, whether hypertension is a symptom or a disease, since it kills people who would survive if they did not have hypertension? Failure to treat hypertension because "it is a symptom and not a disease" is entirely illogical and represents an attitude of mind which should be strongly condemned. There is need for reduction of blood pressure in essential hypertension.

2. There is a common belief that elevation of the blood pressure in essential hypertension is necessary for normal function of the body, particularly of the kidneys, and that reduction of blood pressure might seriously impair normal activity. There is no support for this belief. Our studies at the Mayo Clinic, and those of others, indicate that blood pressure may be reduced by sympathectomy with the result that cardiac and renal function are improved, or, at least that they are not impaired. Almost uniformly, patients having hypertension feel better when their blood pressure is reduced by operation than they felt before its reduction. Headache, dizziness, pain in the thorax and nervousness are benefited in a routine way when the blood pressure is reduced. Dyspnea and fatigue with exertion may occur after operation but tend to disappear as the time after operation increases. None is disabled.

3. There is an attitude of hopelessness concerning the treatment of essential hypertension. Many physicians have tried remedy after remedy highly recommended in advertisements and by detail men but have failed to demonstrate any beneficial effects of these preparations on blood pressure. Pessimism is justified in many instances but the situation does not appear to be hopeless.

The mechanism by which blood pressure is elevated is well known. The arterioles offer increased resistance to the flow of blood through them. In the earlier phase

of most instances of essential hypertension, this increased resistance is functional and reversible as is shown by the observation that rest, sedatives and anesthetics reduce the blood pressure to normal or nearly to normal. All that is needed to lower blood pressure in early phases of essential hypertension is a drug which produces prolonged vasodilatation but no harmful side effects. Preferably the drug should be effective when taken orally, but that is relatively unimportant. A drug with such an action is not now available, as far as I know. However, probably it can be made. Studies are in progress now.

Unfortunately, there is not much new to report in the medical treatment of essential hypertension but I shall briefly discuss the use of potassium thiocyanate, which is not new but has been much better controlled in recent years. Barker² has shown that the blood pressure of about 50 per cent of hypertensive patients is reduced by careful treatment with potassium thiocyanate. The amount of this drug which is administered should be determined by frequent calculations of the concentration of cyanate in the blood, which ordinarily should range between 8 and 12 mg. per hundred cubic centimeters. The technic has been described by Barker and has been modified by Griffith and Lindauer.³ As little as 3 grains (0.2 Gm.) and as much as 12 grains (0.8 Gm.) of potassium thiocyanate must be administered orally each day to cause this concentration in the blood. Such symptoms as headache, insomnia and nervousness may be relieved whether or not blood pressure is reduced. Fatigue, microcytic anemia and enlargement of the thyroid gland may occur even if administration of the drug is well controlled. If concentration in the blood is too great, lethargy, mental confusion, weakness, difficulty of speech, cutaneous lesions and collapse may occur.

THROMBOPHLEBITIS, VENOUS INSUFFICIENCY, VARICOSE ULCER

There is not much essentially new in the treatment of thrombophlebitis but there has been wider recognition of the pathologic changes occurring in this disease and of the physiologic disturbances which result from it. Thrombophlebitis should be considered an episode of acute inflammation of a vein, resulting in thrombosis. It is improbable that there is ever chronic phlebitis, although phlebitis may appear recurrently. Treatment after the acute phase consists, therefore, of prevention

2. Barker, M. H.: The Blood Cyanates in the Treatment of Hypertension, *J. A. M. A.* 100, 6; The Use of Cyanates in the Treatment of . . . *J. 26:28-32 (Jan. 9) 1937*; Results of Treatment . . . Obliterans by Foreign Protein, *J. A. M. A.* 97:841-843 (Sept. 19) 1931. Barker, N. W., and Roth, Grace M.: The Treatment of Occlusive Arterial Disease of the Legs by Means of the Sanders Vasodilator (Sanders Bed), *Am. Heart J.* 18:312-317 (Sept.) 1939.

3. Griffith, J. Q., Jr., and Lindauer, M. A.: Thiocyanate Therapy in Hypertension Including a New Micromethod for Determining Blood Thiocyanates, *Am. Heart J.* 14:710-716 (Dec.) 1937.

From the Division of Medicine, the Mayo Clinic.
Read before the New York Academy of Medicine, New York, May 4, 1939.

1. This is an estimate. Reliable statistics on this subject are not available.

of venous stasis which may result and of prevention of recurrent episodes of phlebitis. Acute superficial phlebitis occurring spontaneously or in varices should be treated simply by rest and application of hot moist packs until there is no further extension of inflammation and until local signs of inflammation have disappeared. This is usually from seven to ten days. Sometimes roentgen therapy or the use of sulfanilamide hurries disappearance of inflammation. Prevention of recurrence of idiopathic phlebitis is largely unsatisfactory. Sometimes removal of foci of infection and cessation of smoking seem to help. In other instances, vaccines made from organisms cultured from the nasopharynx, prostate gland, teeth or tonsils seem to cause diminution in the number of episodes or of disappearance of them.

In the treatment of femoral and iliac thrombophlebitis one must consider (1) the possibility of pulmonary embolism, (2) management during the acute stage of the disease and (3) the prevention of chronic venous insufficiency of the limb. Once the signs and symptoms of femoral and iliac thrombophlebitis appear, the danger of pulmonary embolism is comparatively small. In their statistical study of 116 consecutive cases of fatal, postoperative, pulmonary embolism, Barker and Counseller⁴ found that thrombophlebitis of the femoral and iliac veins which could be recognized clinically was present in only five cases. Conversely, in a series of fifty-four cases of postoperative femoral and iliac thrombophlebitis fatal pulmonary embolism occurred only once and small, nonfatal pulmonary emboli occurred in only three other cases. The danger of pulmonary embolism in clinically recognizable, postoperative femoral and iliac thrombophlebitis, therefore, usually seems to be dependent on a new episode of thrombosis in a different vein.

The treatment which Barker and Counseller have used during the acute stage of iliac and femoral thrombophlebitis is comparatively simple and consists of adequate elevation of the leg (to an angle of 30 degrees from the horizontal) obtained by using a back rest covered with pillows. Hot wet packs are applied continuously from the foot to the groin. Elevation of the leg and local application of heat are continued until the patient's temperature has remained normal for four days, until all swelling and edema have disappeared from the leg below the knee and until all pain and tenderness have disappeared from Scarpa's triangle and the region of the large veins distal to it. This usually requires from ten to eighteen days. We feel that it is not necessary to keep the patient in bed for a longer time and that prolonged periods of rest in bed favor rather than prevent the development of other episodes of thrombosis and embolism. Prolonged rest in bed also favors the development of atrophy of the muscles of the leg, osteoporosis and postphlebotic neurosis, which has been described by Allen and Brown.⁵

It is necessary to equip the patient with an adequate support for the affected leg as soon as he gets out of bed and to instruct him to use it consistently for a period of months. In the presence of partial venous obstruction, marked increase in venous pressure is likely to be responsible for the rapid development of chronic venous insufficiency, recurrent static edema, secondary varicose veins and subsequently even chronic cellulitis and ulceration of the skin. The manifestations

of chronic venous insufficiency rarely, if ever, occur in the thigh. Hence it is not necessary to apply the support above the knee; furthermore, this is difficult and not practicable. It is necessary that the support prevent edema when the patient is standing and walking and that it be comfortable. Several types of support have been used. In cases of femoral and iliac thrombophlebitis the cloth and rubber are usually inadequate. Heavy elastic stockings may be adequate if they are made to measure and if they fit well. They have the disadvantages of being expensive, of wearing out or losing their elasticity in a few months and of not being adjustable. The most satisfactory support is a heavy, pure rubber bandage applied over a cotton stocking from the toes to the knee, with only a small portion of the heel exposed. The shoe should completely overlap the lower margins of the bandage. The advantages of this rubber bandage are that it will prevent orthostatic edema in practically all cases, that it can be adjusted until it is comfortable and that it is relatively inexpensive and does not wear out for a long time. Its disadvantages are that it is hot, particularly in the summer, that some patients, particularly women, object to its appearance as compared with that of an elastic stocking and that some skins are abnormally sensitive to rubber. The bandage or elastic stocking should be worn all the time that the patient is up and around. Each month the patient should go without the bandage for one day. Whenever edema does not occur, the support can be discarded.

The literature contains reports of several other measures which have been used in the treatment of thrombophlebitis during the acute state; namely, roentgen therapy, diuresis, application of leeches, dietary limitations and administration of sodium thiosulfate. Barker and Counseller have expressed the belief that results have not been any better in cases of postoperative thrombophlebitis when these measures have been used than when treatment consisted simply of adequate elevation of the limb, adequate application of moist heat to the limb, a comparatively short period of rest in bed and subsequently an adequate support for the leg. Leriche⁶ expressed the opinion that thrombosis itself in thrombophlebitis does not cause the symptoms which are actually due to venospasm and arteriospasm, the former of which is responsible occasionally for discoloration of the limb and the latter of which causes pain and offers obstruction to the flow of blood.

Recently a good deal has been written and spoken about the treatment of deep phlebitis by anesthetization of the lumbar sympathetic nerve trunks because it seems desirable to relieve impaired arterial circulation, which apparently results from phlebitis. I wish to make three comments: 1. It has not been demonstrated that impaired arterial circulation adds to the disability resulting from acute phlebitis. 2. It has not been demonstrated that relief of arterial spasm hurries convalescence from acute phlebitis. 3. If it is desirable to relieve arterial spasm, anesthetization of the lumbar sympathetic nerves is almost the most unsatisfactory method because it is complicated and the results are of short duration. Application of hot packs to the involved limb is probably as satisfactory and much simpler. Other effective ways of inducing vasodilatation are immersion of a hand in water at 113 F., diathermy, environmental temperature of about 85 F. and direct

4. Barker, N. W., and Counseller, V. S.: Treatment of Postoperative Thrombophlebitis, *Proc. Staff Meet., Mayo Clin.* 13:785-787 (Dec. 14) 1938.

5. Allen, E. V., and Brown, G. E.: Neurosis of the Extremities Following Phlebitis, *M. Clin. North America* 15:123-127 (July) 1931; Intermittent Pre-sure and Suction in the Treatment of Chronic Occlusive Arterial Disease, *J. A. M. A.* 103:2029-2034 (Dec. 21) 1935.

6. Leriche, René: Considérations sur le traitement chirurgical de la phlébite du membre inférieur et des ses séquelles éloignées, *J. internat. de chir.* 3:585-598 (Nov.-Dec.) 1938.

application of heat to the body. I see no need for anesthetization of lumbar sympathetic nerves in acute phlebitis.

Nothing need be said here about the efficacy of the injection treatment of varicose veins; it is an accepted and usually successful method of treatment. Most interesting is the report of Duryee and Wright,⁷ who stated that iontophoresis with a 0.5 per cent solution of acetyl-beta-methylcholine chloride (mecholy) two to three times a week, for from six to 165 treatments, caused healing in nine cases of chronic varicose ulcer in spite of continuance of normal activity by all their patients. Kovacs⁸ had pointed out previously that iontophoresis was a way to secure a better local effect of the mecholy.

RAYNAUD'S DISEASE

Kraetzer⁹ expressed the belief that Raynaud's disease may be due to chronic intoxication from arsenic. The urine of seven patients who had Raynaud's disease contained arsenic.¹⁰ All were treated twice a week with intravenous injections of 0.5 Gm. of freshly prepared sodium thiosulfate for as long as twenty-two months or for as short a period as one month. Cure and marked improvement were noted. Kovacs, Saylor and Wright¹¹ reported that iontophoresis with mecholy in solution, given from two to three times a week, caused increased warmth of and improved color of the hands and feet and lessening of frequency with which attacks of discoloration occurred in twelve instances of Raynaud's disease. Both of these methods should be tried extensively, particularly in cases of Raynaud's disease not cured by sympathectomy.

ARTERIAL EMBOLISM

It seems clear now that diminution of circulation occurring when an embolism lodges in an artery is due only partially to mechanical obstruction by the clot. More important is the diffuse regional arterial spasm which results and which greatly impairs circulation (McKechnie and Allen¹²). If this spasm can be relieved promptly, circulation can be restored to a fairly normal state without removing the embolus. Relief of spasm in the limb can be accomplished in some instances by intermittent suction and pressure, intermittent venous obstruction, anesthetization of sympathetic nerves, spinal or general anesthesia, increased environmental temperature, induction of fever and by other means. Certainly such relief often occurs spontaneously. Papaverine hydrochloride, which is an anti-spasmodic, vasodilating drug, may help greatly if injected intravenously or into the artery above the site of the embolus (Allen and MacLean¹³). Papaverine hydrochloride when given intravenously may benefit

greatly the patient who has acute pulmonary embolism. Leriche, Fontaine and Friedman¹⁴ expressed the belief that anesthetization of the stellate sympathetic ganglion may help by relieving spasm of pulmonary arteries in this condition. Unfortunately their reported results were not impressive. Patients who have cerebral thrombosis may perhaps be benefited by the same procedure or by injecting papaverine into the carotid artery. It should always be borne in mind that in cases of arterial embolism and of sudden arterial thrombosis the chief therapeutic indication is to cause vasodilatation to relieve the regional arterial spasm commonly resulting from sudden arterial occlusion. Collins¹⁵ reported that fifteen of seventeen patients who had severe, massive, postoperative pulmonary embolism recovered following the use of papaverine. Six of seven patients who had embolism of the arteries of the extremities recovered. It is to be hoped that others have as good results as Collins has had. Our results are not nearly as impressive as those of Collins but I do believe there is some merit in this type of treatment. Papaverine hydrochloride one-half grain (0.032 Gm.) is about the right amount to inject intravenously or intra-arterially. More can be given with caution. Injections can be repeated every hour or so, depending on the reaction of the patient.

THROMBO-ANGIITIS OBLITERANS

Cessation of Smoking.—Hardly new, but well worth emphasizing again, is the great importance of complete cessation of smoking by patients having thrombo-angiitis obliterans. It is well known that tobacco smoking causes impairment of arterial circulation, manifested in the extremities by decreased cutaneous temperature, in the general condition by increased blood pressure and in the eyes by visible arterial constriction. These changes in circulation are, to be sure, transient but, when a patient smokes heavily, impairment of circulation may be persistent during hours in which the patient smokes. Abnormal arterial and arteriolar constriction is far removed pathologically from organic arterial changes, yet there is evidence that prolonged spasm such as that induced by ergot may produce organic changes in arteries. Friedlander, Silbert and Laskey¹⁶ have shown that an extract of commercially denicotinized cigarettes in Ringer's solution, injected intraperitoneally into male albino rats, may cause gangrene of the toes. One of the six rats subjected daily to inhalation of tobacco smoke for five months was afflicted with gangrene of the toes and one of ten animals treated by daily intraperitoneal injections of alkaloid nicotine tartrate also developed gangrene. Furthermore, Helmer, Kohlstaedt and Page¹⁷ have shown that the blood and urine of tobacco smokers may contain rather large amounts of nicotine, which may produce organic changes in some way as yet not understood. More important than any of these considerations, however, is the often repeated clinical observation that patients having thrombo-angiitis obliterans who continue to smoke do not ordinarily improve as much as do patients who cease smoking. It is difficult to impress on patients the importance of stopping smoking.

7. Duryee, A. W., and Wright, I. S.: The Treatment of Scleroderma by Means of Acetyl-Beta-Methylcholine Chloride (Mecholy) Iontophoresis, *Am. Heart J.* 14: 603-613 (Nov.) 1937.

8. Kovacs, Joseph: The Iontophoresis of Acetyl-Beta-Methylcholine Chloride in the Treatment of Chronic Arthritis and Peripheral Vascular Disease: Preliminary Report, *Am. J. M. Sc.* 188: 32-36 (July) 1934.

9. Kraetzer, A. F.: Raynaud's Disease: A Hypothesis as to Its Cause, *New York State J. Med.* 35: 1130-1136 (Nov. 15) 1935.

10. Hines, E. A., Jr.: Personal communication to the author. Dr. Hines, of the Mayo Clinic, found no significant amount of arsenic in the urine of seven patients with Raynaud's disease.

11. Kovacs, Joseph; Saylor, L. L., and Wright, I. S.: The Pharmacological and Therapeutic Effects of Certain Choline Compounds: Results in the Treatment of Hypertension, Arthritis, Organic Occlusive Vascular Disease, Raynaud's Disease, Scleroderma and Varicose Ulcers, *Am. Heart J.* 11: 53-65 (Jan.) 1936.

12. McKechnie, R. E., and Allen, E. V.: Sudden Occlusion of the Arteries of the Extremities: A Study of 100 Cases of Embolism and Thrombosis, *Surg., Gynec. & Obst.* 63: 231-240 (Aug.) 1936; Effect on the Circulation of Mechanical Occlusion of Individual Arteries of the Extremities: Relation to Arterial Embolism, *Am. Heart J.* 14: 127-134 (Aug.) 1937.

13. Allen, E. V., and MacLean, A. R.: Treatment of Sudden Arterial Occlusion with Papaverine Hydrochloride, *Proc. Staff Meet., Mayo Clin.* 10: 216-220 (April 3) 1935.

14. Leriche, René; Fontaine, René, and Friedman, Léon: L'infiltration stellaire est-elle justifiée dans l'embolie pulmonaire du point de vue physiologique et anatomopathologique? Quelle place doit-elle occuper dans la thérapeutique de cette affection? *J. de chir.* 50: 737-748 (Dec.) 1937.

15. Collins, D. C.: The Value of Papaverine Hydrochloride in the Treatment of Arterial Embolism, *M. Rec.* 148: 186-190 (Sept. 7) 1938.

16. Friedlander, Mae; Silbert, Samuel, and Laskey, Norman: Toe Lesions Following Tobacco Injections in Rats, *Proc. Soc. Exper. Biol. & Med.* 34: 156-157 (March) 1936.

17. Helmer, O. M.; Kohlstaedt, K. G., and Page, I. H.: The Isolation of Nicotine from Human Urine, *Am. Heart J.* 17: 15-20 (Jan.) 1939.

To do so I tell them "You can have your legs or your tobacco but not both." Subsequently I qualify the statement.

Intravenous Injection of Typhoid Vaccine.—In several clinics the repeated intravenous injection of typhoid vaccine to induce fever and to effect vasodilatation has been the most successful method of treatment of thrombo-angiitis obliterans. In a report of 150 cases in which treatment was administered by this method, Barker¹⁸ wrote that in 86 per cent pain while the patients were at rest was relieved if ulceration was absent, healing of ulcers occurred in 86 per cent, and healing of gangrene limited to the toes in 65 per cent. In 76 per cent of all cases repeated intravenous injections of typhoid vaccine to induce fever caused marked improvement. Barker pointed out that definite vasodilatation in the extremities could be demonstrated and that relief of pain was of a greater degree than could be explained by induced vasodilatation. This method of treatment has the advantage of simplicity and cheapness. It requires no machinery, which is perhaps one reason why it does not appeal more strongly to physicians or patients. I consider it the best of all methods of treatment in many cases of thrombo-angiitis obliterans.

Sulfanilamide.—Administration of this drug has proved useful in treatment of the acute or subacute infections so often associated with ulcerated or gangrenous lesions of thrombo-angiitis obliterans, and in treatment of acute phlebitis. Patients who have thrombo-angiitis obliterans who are under close observation should be treated with sulfanilamide or neoprontosil given regularly or intermittently over long periods. There is excellent opportunity for such a study to determine whether thrombo-angiitis obliterans is due to infection which can be minimized or eliminated by sulfanilamide.

Sodium Iodide Thiosulfate.—This drug has been recommended by Rabinowitz,¹⁹ because in his opinion it palliates the deleterious effects of anoxemia by increasing absorption of oxygen by the tissues, lengthens coagulation time, diminishes the tendency to thrombosis and converts choline into nontoxic compounds. Rabinowitz gave 50 grains (3.3 Gm.) of sodium iodide thiosulfate intravenously every other day for three weeks and twice a week thereafter for two months. All foods rich in phospholipins were eliminated from the diet. As a result of this treatment, pain disappeared and healing of gangrenous lesions occurred in sixty-three cases of thrombo-angiitis obliterans. As yet I have not seen reports by others of similar results, and we at the clinic have not benefited patients in a limited trial of treatment with sodium iodide thiosulfate.

A Proprietary Pancreatic Preparation (padutin).—Loeweneck and Madlener²⁰ gave slow intravenous infusions, over a period of from eight to ten hours, of 40 to 80 units of padutin in from 1 to 2 liters of physiologic solution of sodium chloride and repeated the injection every few days. Between periods of slow intravenous infusion, single injections of the preparation were given. The investigators noted relief of pain, improvement in arterial pulsations, increased warmth of skin and improvement in ulceration in thrombo-angiitis obliterans. This method of treatment should be given further trial.

ARTERIOSCLEROSIS

Frequently the concentration of fats in the blood is definitely increased. A quick conclusion is that the arterial changes are due to the increased concentration of fats or that the two result from a common cause. Leary²¹ has maintained that atherosclerosis results directly from impaired metabolism of cholesterol. Huber, Broun and Casey²² have shown that atherosclerosis, easily induced in rabbits by feeding cholesterol, can be prevented by administration of a pancreatic extract (lipocaic) which also prevents increase in the concentration of cholesterol in the blood. The pancreas may have another hormone in addition to insulin which is specific for metabolism of fat and this hormone may be perverted in quality or diminished in quantity in some cases of arteriosclerosis obliterans, producing both hyperlipemia and atherosclerosis. Perhaps ingestion of too much fat and cholesterol is responsible. Much can be expected from researches in this field in the near future. Leary quoted Shields and White to the effect that reduction of fat and cholesterol in the diet of diabetic patients reduces the incidence of atherosclerosis to normal and that a similar arrangement of diet causes xanthomas and roentgenologic evidence of arteriosclerosis to disappear. There is no close agreement on this matter. It is certain that elimination of sources of animal fats, that is eggs, milk and its products, and fat meats, from the diet has reduced greatly the concentration of the fats in the blood in many instances of hyperlipemia. It is worth trial in all cases in which the quantity of fats in the blood is increased.

COMMON METHODS OF TREATMENT OF BOTH ARTERIOSCLEROSIS OBLITERANS AND THROMBO-ANGIITIS OBLITERANS

The Sanders Bed.—Barker and Roth² have studied the results of treatment of eighty-eight patients having chronic occlusive arterial diseases by means of the oscillating Sanders bed. The results may be summarized as follows:

1. Relief of simple rest pain: Twelve of thirteen patients were completely relieved during treatment. Eleven of thirteen patients were permanently relieved by treatment.²³

2. Relief of pain of ischemic neuritis: Nine of fifteen patients were completely relieved during treatment. All fifteen patients were relieved by continued treatment.

3. Relief of pain associated with ulcers and gangrene: Thirty-two of forty-four patients were completely relieved during treatment. Twenty-two of forty-four patients were permanently relieved by treatment.²⁴ Healing occurred for all these patients.

Of thirty-four patients who were relieved during treatment on the Sanders bed, twenty-one were either not relieved or their pain was made worse by intermittent suction and pressure. Three patients were relieved by passive vascular exercise and not by treatment on the Sanders bed, while nine patients were relieved of pain equally by the two measures and eight were relieved by neither form of treatment.

The principle of treatment by the Sanders bed is that of passive postural exercises which allow intermittent filling and emptying of capillaries, venules and probably of arterioles. There is not much conclusive objective evidence that the circulation is improved, although the cutaneous temperature and oscillometric index may be increased.

21. Leary, Timothy: Atherosclerosis; Etiology, Arch. Path. 21: 459-462 (April) 1936.

18. Barker (footnote 2, third reference).
19. Rabinowitz, H. M.: The Use of Sodium Iodide Thiosulfate (Activated Sulfur) in Treatment of Thrombo-Angiitis Obliterans, J. Chemotherapy 13: 1-4 (April) 1936.

20. Loeweneck, M., and Madlener, M.: Intravenöse Dauerinfusion von Padutin, Deutsche Ztschr. f. Chir. 248: 700-707 (March) 1937.

22. Huber, M. J.; Broun, G. O., and Casey, A. E.: Prevention of Cholesterol Arteriosclerosis in the Rabbit by Use of Pancreatic Extract (Lipocaic), Proc. Soc. Exper. Biol. & Med. 37: 441-445 (Dec.) 1937.

23. Six patients had other treatment.
24. Ten had other treatment.

Intermittent Venous Compression.—Reports of value differ greatly, varying from those indicating that the method has no value whatever to those indicating remarkable improvement in the status of patients who have chronic occlusive arterial diseases. By using either a specially constructed machine or an ordinary blood pressure cuff manually, the limb is compressed for two minutes and then the pressure is released for two minutes. Patients who have open lesions are treated continuously day and night, and the cuff is inflated to from 30 to 40 mm. of mercury. After three days, treatment is reduced to from eight to ten hours daily. Patients who have no open lesions are treated continuously, pressures as high as from 60 to 80 mm. of mercury being used. Compression and release alternate for several hours daily. The treatment is based on the observation that hyperemia follows release of venous compression. There is some (but inconclusive) evidence of increased blood flow. The supporters of the method believe that treatment carried out for many hours produces persistent increases in circulation in contrast to the transient hyperemia which follows simple release of venous compression.

Collens, Wilensky and Ginsberg²⁵ reported the healing of 71 per cent of patients having gangrene and ulceration due to thrombo-angiitis obliterans, and relief of pain in 85 per cent of cases. Better results occurred in the treatment of nondiabetic patients having arteriosclerosis obliterans, but the results were less good in the treatment of diabetic patients having arteriosclerosis obliterans. Seven patients who had acute embolus and arterial thrombosis were relieved of pain, four recovered completely, two died but did not require amputation, and one patient required amputation. De Takats²⁶ reported that coldness and numbness of the extremities are relieved first, that intermittent claudication is influenced little and slowly and that "rest pain, if present, is a sign of serious circulatory disturbance and at this stage little can be expected from such treatments." He differed, therefore, with Collens and Wilensky, who reported marked relief of rest pain. Some physicians who have used intermittent venous occlusion adequately say that it has no value as a therapeutic method. I have had inadequate experience with it, but I doubt that the method has much virtue.

Kountz and Smith²⁷ used five cuffs to increase the venous pressure. The pressure was usually 40 mm. of mercury in the most proximal cuff and about 20 mm. of mercury in the other cuffs. The system is inflated and deflated about every six minutes for two hours a day. Improvement was noted in the condition of patients having thrombo-angiitis obliterans and arteriosclerosis obliterans, but unfortunately for dispassionate evaluation of the method of treatment several other forms of treatment were administered simultaneously.

Intermittent Arterial Compression.—Thiele²⁸ described a method of compressing the arteries to an extremity by means of an ordinary sphygmomanometer. The pressure in the cuff is maintained above the

systolic blood pressure for five, ten or fifteen minute periods and is then rapidly deflated for ten or fifteen minutes before reinflation. According to Thiele, such manipulation causes hyperemia. The cycle of inflation-deflation is repeated from five to eight times during one course of treatment.

Theoretically, according to Thiele, during the stage of compression the blood flows into the veins, the vessels collapse, metabolic changes occur and the blood vessels dilate. At the beginning of treatment little or delayed rubor occurs when the cuff is deflated and moves distalward slowly. After some treatment the reactionary rubor occurs promptly and intensively and quickly involves the entire extremity. Thiele reports relief of pain and restoration of circulation in two cases of arteriosclerosis obliterans and in other cases in which the diagnoses were vascular spasm with hypertension, angiospasm and dyspraxia angiospastica. Interestingly, patients having chronic arthritis were greatly benefited. The method is worthy of more extensive trial. It is perhaps a sign of unwarranted skepticism that causes one to doubt that the results will be as good as indicated by Thiele.

Diathermy.—Bennett²⁹ and others have emphasized the effectiveness of short wave diathermy in producing peripheral vasodilatation. Application is made to the lumbar region by means of a cable or by applying one pad to the lumbar region and the other to the lower portion of the abdomen or to a thigh. In the presence of chronic occlusive arterial diseases the cutaneous temperature begins to increase in about fifteen to twenty minutes and reaches a maximum in, roughly, a similar period of time. When diathermy is discontinued, the cutaneous temperature of the toes of a patient clad with only a sheet decreases in about forty-five minutes to that value which had obtained before institution of the treatment. If the patient is wrapped in blankets, peripheral vasodilatation may persist for several hours, since the oral temperature increases as much as 3 degrees F. (approximately 2 degrees C.) and this fever persists for some time, provoking peripheral vasodilatation. Extensive observations have not yet been made on the relief of pain and clinical improvement. It is unfortunate that the vasodilatation induced by short wave diathermy persists so briefly, but it is no more illogical to assume that permanent vasodilatation may result from this form of treatment than it is to assume that permanent vasodilatation may result from intermittent venous or arterial compression or from intermittent suction and pressure. Diathermy has a contrasting advantage over many other forms of treatment in that it obviously produces an increase in the flow of blood.

Administration of Sodium Chloride by Mouth and Intravenously.—Sandstead and Beams³⁰ noted that the oral administration of sodium chloride causes relief of pain caused by neuritis and impaired circulation in the presence of diabetes, and definite signs of improvement in circulation, such as healing of gangrenous ulcers and indolent ulcers, and improvement in the color and temperature of the feet. These authors gave from 15 to 90 Gm. of sodium chloride daily over periods of ten to fourteen days, with interruptions of ten to fourteen days. They felt that the beneficial effects were the result of vasodilatation induced by the ingestion of

25. Collens, W. S.; Wilensky, N. D., and Ginsberg, Hyman: Intermittent Venous Occlusion in Peripheral Vascular Disease: Study of Its Physiologic Mechanism and Therapeutic Effects, *Arch. Phys. Therapy* 19: 261-271 (May) 1938. Collens, W. S., and Wilensky, N. D.: Intermittent Venous Occlusion in Treatment of Peripheral Vascular Disease: An Experience with 124 Cases, *J. A. M. A.* 109: 2125-2130 (Dec. 25) 1937.

26. de Takats, Geza: Intermittent Venous Hyperemia for the Treatment of Peripheral Vascular Disease, *Physiotherapy Rev.* 18: 7-8 (Jan.-Feb.) 1938.

27. Kountz, W. B., and Smith, J. R.: Observations on Passive Vascular Exercise and Other Forms of Treatment of Peripheral Vascular Disease, *Am. Heart J.* 16: 55-65 (July) 1938.

28. Thiele, Wolfgang: Ueber die Behandlung mit aktiver nach Ganter, *München. med. Wchnschr.* 85: 988-990 (June 30) 1938.

29. Bennett: Personal communication to the author.

30. Sandstead, H. R., and Beams, A. J.: Relief of Diabetic Pain of Neurocirculatory Origin by Oral Administration of Sodium Chloride, *Arch. Int. Med.* 6: 371-380 (March) 1938.

salt, although they showed no evidence of such an effect. Silbert³¹ advised repeated intravenous injections of hypertonic solutions of sodium chloride for patients having thrombo-angiitis obliterans. An initial injection of 150 cc. of a solution of 5 per cent sodium chloride is administered and all subsequent injections are 300 cc. of a 5 per cent solution, given at the rate of about 30 cc. per minute. At first injections are given on alternate days, later twice a week, and still less frequently as improvement occurs. Treatment is continued for from six weeks to two years. As a result of this method of treatment, to which were added occasional nerve section for relief of pain, and cessation of smoking, the incidence of amputation was decreased from 62 per cent to 6.4 per cent. Silbert believes that thrombo-angiitis obliterans is not a progressive disease when patients stop smoking. Samuels³² has confirmed Silbert's observations relative to the beneficial effects of a repeatedly injected solution of 5 per cent sodium chloride. Although some observers are not enthusiastic about the treatment outlined by Silbert and by Samuels and are frankly skeptical of the therapeutic results, it is apparent that patients receiving this treatment from these two investigators have improved remarkably. As in many other situations, it is difficult to determine whether or not the improvement was due to this treatment alone.

The Administration of Sodium Citrate Orally or Intravenously.—Bernheim and London³³ reemphasize the value of administration of sodium citrate, of which 250 cc. of a 2 per cent solution is administered intravenously as often as daily for as long as six months but on an average of only three months. It may be administered orally also. When cessation of smoking, a diet high in calcium and vitamins, avoidance of worry, and diminished physical activity were added to this method of treatment of fifty-four patients having thrombo-angiitis obliterans and ninety-nine patients having arteriosclerosis obliterans, excellent results followed. Intermittent claudication was benefited in about 75 per cent of cases, rest pain was relieved in about 80 per cent of cases and ulcers were improved in about 85 per cent of cases. These authors believed that the administration of sodium citrate reduced viscosity and fibrinogen of the blood and increased the excretion of calcium. If I read their charts correctly, all five patients having thrombo-angiitis obliterans were improved by dietary treatment alone, as were thirty of thirty-one patients who had arteriosclerosis obliterans. One wishes that Drs. Bernheim and London had studied a group of patients for whom even a diet was not prescribed. Would the results have been as good?

Intermittent Suction and Pressure.—This method of treatment has been much favored since it was redescribed by Herrmann³⁴ and by Landis and Gibbon³⁵ in 1933. Herrmann devised the machine which is now used commonly for the improvement of circulation in occlusive arterial diseases by intermittently decreasing and increasing the environmental pressure around the extremities. He believed that pressure should be equivalent to about 20 mm. of mercury and that it should endure for about three seconds, while suction

should be equivalent to about 80 mm. of mercury and endure about twelve seconds. The treatment is intended to dilate collateral arterial pathways and thus improve circulation. Herrmann reported the recovery of six of seven patients who had arterial embolism, all of fourteen patients who had acute arterial thrombosis, improvement of intermittent claudication in many instances, relief of pain and healing of gangrenous ulcers in twenty of twenty-one patients who had advanced thrombo-angiitis obliterans, and much improvement in the condition of patients who had arteriosclerosis obliterans. Excellent results in treating such patients were reported in previous publications. Unfortunately the method of classification of occlusive vascular diseases as presented in Herrmann's monograph is so unorthodox and the presentation of results of therapy is so indefinite that the reader cannot evaluate results of treatment for himself. Various other students of peripheral vascular disease have not agreed that Herrmann's ingenious method of treatment is of first class therapeutic benefit.

Kountz and Smith,³⁷ for example, found that definite improvement followed treatment of only one of seventeen patients who had arteriosclerosis obliterans, and very minor improvement of only two of eight patients who had thrombo-angiitis obliterans. There were no notable changes in the oscillometric index, and injections of colloidal thorium dioxide showed no improvement in the collateral circulation. Brown and I⁵ did not find intermittent suction and pressure method of treatment of much clinical value. Wilson and Roome³⁶ reported twelve cases of arteriosclerosis obliterans with subjective improvement in five instances but no permanent objective evidence of improvement. Of eight patients who had thrombo-angiitis obliterans, six were not benefited; intermittent claudication was improved in two instances.

Holman³⁷ modified the boot devised by Herrmann so that it could be applied directly to the thigh. The pressure within the chamber alternates every five seconds from —70 to +50 mm. of mercury. Holman believed that such a chamber exerted its influence on undiseased vessels instead of on occluded arteries, as the passive vascular exercise boot does, and he pointed out that it could be used in the presence of infection and when pain made the boot intolerable. Holman felt that the thigh chamber was actually a peripheral heart which draws blood into the extremity during the phase of suction and which forces blood into the peripheral arteries during the phase of pressure. I doubt that this opinion can be supported by physiologic evidence. He wrote that the clinical results obtained from treatment with the suction pressure chamber applied to the thigh were better than those obtained with passive vascular exercise. Too few results have been presented to allow evaluation of the method by the reader.

SUMMARY DISCUSSION OF METHODS OF TREATMENT OF CHRONIC OCCLUSIVE ARTERIAL DISEASES

When one reads of the results of various methods of treatment for chronic occlusive arterial diseases, two things are impressive. The reported results are surprisingly good and the reported results of one particular method of treatment duplicate surprisingly the reported

31. Silbert, Samuel: Amputations in Thrombo-Angiitis Obliterans, S. Clin. North America 18: 389-403 (April) 1938.

32. Samuels, S. S.: The Conservative Treatment of Thrombo-Angiitis Obliterans, Lancet 2: 1511-1513 (Dec. 26) 1936.

33. Bernheim, Alice, and London, Isabel: Arteriosclerosis and Thrombo-Angiitis Obliterans: Report of Cases and Treatment, J. A. M. A. 108: 2102-2109 (June 19) 1937.

34. Herrmann, L. G.: Passive Vascular Exercises, London, J. B. Lippincott Company, 1936.

35. Landis, E. M., and Gibbon, J. H., Jr.: Effects of Alternate Suction and Pressure on Circulation in the Lower Extremities, Proc. Soc. Exper. Biol. & Med. 30: 593-595 (Feb.) 1933.

36. Wilson, Harwell, and Roome, N. W.: Passive Vascular Exercise: Observations on Its Value in the Treatment of Peripheral Vascular Disease, J. A. M. A. 106: 1885-1888 (May 30) 1936.

37. Holman, Emile: Recognition and Treatment of Peripheral Vascular Occlusion, Northwest Med. 37: 65-71 (March) 1938.

results of other methods of treatment. This correlation can be explained in several ways. Perhaps the results are as good as reported because of specific methods of treatment and perhaps the surprising correlation of good results of individual methods of treatment is due to the fact that only a certain percentage of patients can be benefited. Perhaps also there is too much enthusiasm on the part of the investigator who reports good results either because he has a definite pride in the method which he has originated or because he is not sufficiently experienced to exercise cautious judgment. This would appear to be definitely true when other students cannot confirm the good results of a specific method of treatment. Perhaps the specific method of treatment is not responsible at all for improvement or, if it is, it is responsible only remotely, while most benefit originates from good general care such as cessation of smoking, rest in bed, warmth and comfort.

The number of reported cures for chronic occlusive arterial diseases indicates that the field of vascular diseases has come of age. It is now almost on a par with gastro-enterology, for example, since there are, similarly, many "cures" for duodenal ulcer. It is well to emphasize that almost all the good reports of treatment of thrombo-angiitis obliterans are based on clinical results, a shaky foundation at best when numerous factors must be considered. There is surprisingly little objective evidence to support the conclusion that much of the treatment causes a definite increase in the flow of blood to extremities deprived of blood. Even if an individual treatment causes increased circulation transiently, one cannot conclude that repeated treatments cause a permanent increase in circulation unless there is definite objective evidence that this is true.

That which has been said in the foregoing paragraphs is relatively unimportant. Much more important is the fact that progress is being made in treatment, even if by chance it is not as great as some reports indicate. There is still much to be accomplished, for Horton³⁸ has shown that many patients receive little or no treatment and that, of these, about 60 per cent will require amputation within ten years' time. It is only when this percentage is greatly reduced that we of the medical profession can have much pride in our treatment of chronic occlusive arterial diseases.

38. Horton, B. T.: The Outlook in Thrombo-Angiitis Obliterans, *J. A. M. A.* 111: 2184-2188 (Dec. 10) 1938.

Food, Fun and Frolic.—Apart from disease of the central nervous system and grave physical defects, the prevailing notions as to the relation of mens sana and corpus sanum have been grossly exaggerated. Malnutrition, poverty, dirt, and even a succession of acute or chronic diseases do not seem able of themselves to subdue the master organ of the body, the brain, to any considerable extent. On the other hand it is obvious that malnutrition, poverty, dirt, disease and war do wipe out individuals, families and races. The effect on the race or the breed should not be confused with the effect on the brain of the individual. The psychological effects of class gymnastics have not been considered any more than the psychological effects of grooming, dress and personal adornment. The present problem is anatomical and physiological. Growth, development, posture, like health, depend to a large extent on the freedom for the individual to join in any play, game or sport, to exert himself according to his powers, and to know when he has had enough. Food, fun and frolic are of more importance than drill and discipline. —Harris, H. A.: The Anatomical and Physiological Basis of Physical Training, *Brit. M. J.*, Nov. 11, 1939.

VITAMIN A IN THE BLOOD OF NORMAL ADULTS

THE EFFECT OF A DEPLETION DIET ON BLOOD
VALUES AND BIOPHOTOMETER READINGS

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Many problems concerning the human requirement for vitamin A could be solved if a reliable measure of subclinical vitamin A deficiency were found. The biophotometer test has been suggested for this purpose, but work in this as well as in other laboratories has shown that the test is only fairly reliable and that its relation to stores of vitamin A has yet to be demonstrated. A review of the literature suggests that determinations of vitamin A in the blood may offer another approach to this problem. The present study was consequently undertaken. It includes the results of chemical determinations of vitamin A and of carotene in the blood, as well as biophotometer tests, of five subjects over periods of from two to four months. During this period four of the subjects lived on vitamin A depletion diets save for two short periods of supplementation; the fifth served as the control. Single determinations were also made of the vitamin A and carotene in the blood of thirty-four adults in order to have some idea of the range of values found in normal subjects. Our purpose in this study, as already indicated, was to determine whether the level of vitamin A in the blood is closely related to the body's stores of this vitamin.

LITERATURE

During the last few years a number of studies on the vitamin A and carotene content of human blood have appeared in the literature. With the exception of the work of Clausen and his associates¹ these studies have all been done in foreign countries. The material as a whole is quite heterogeneous in nature as it includes subjects of all ages, races and classes and in various states of health. Furthermore, there is no uniformity in the methods used by the various investigators. Several modifications of the antimony trichloride method for determining vitamin A have been made and the vitamin A equivalents of the "blue units" reported vary with the modification used; the absolute values reported by the various laboratories, therefore, are not strictly comparable. Few of the reports mention whether or not fasting blood was used and in no case are there any quantitative data as to the nature of the diets of the subjects. For these reasons the results of most of the studies are not pertinent to the present problem and will therefore not be reviewed here. Since, however, the extent of the studies and certain of their general conclusions are of interest, they are summarized in table 1.

It will be noted that these studies present but little direct evidence as to whether or not the vitamin A in

From the Department of Home Economics, the University of Chicago. Helen Parkes took all the blood samples and Drs. Clausen and McCoord helped the authors with the method.

1. Chesney, Jack, and McCoord, A. B.: Vitamin A of Serum Following Administration of Haliver Oil in Normal Children and in Chronic Steatorrhea, *Proc. Soc. Exper. Biol. & Med.* 31: 887-888 (April) 1934. Clausen, S. W., and McCoord, A. B.: The Carotenoids and Vitamin A of the Blood, *J. Pediatr.* 12: 635-650 (Nov.) 1938. McCoord, A. B., and Luce-Clausen, Ethel M.: The Storage of Vitamin A in Liver of the Rat, *J. Nutrition* 7: 557-572 (May) 1934.

the blood is related to the body's stores, although several of the authors assume that such a relationship exists. Certain indirect evidence on which there is general agreement make this assumption seem logical: 1. Subjects suffering from a definite vitamin A deficiency have little or no vitamin A in their blood. 2. Subjects from low socio-economic groups, whom one would expect to have poor stores, have on the average less vitamin A in their blood than subjects from the higher socio-economic groups. It is obvious, however, that the significance of these observations cannot be settled until more controlled studies have been made in which the vitamin A and carotene are determined on the fasting blood of normal subjects on a known intake of vitamin

and vitamin A. These four experimental subjects were college students. They were in good physical health and with fair or good dietary histories. There was no doubt, however, that subject G. S. had been receiving the most vitamin A, since several months previously she had taken large amounts of vitamin A concentrate. Subject E. S., on the other hand, had probably been receiving slightly less vitamin A than the other subjects, since her diet included few dairy products or eggs. The one control subject used for this portion of the study was also a college student with a good dietary background.

The thirty-four subjects from whom single samples of blood were obtained were volunteers, either university students or employees. While an attempt was

TABLE 1.—Summary of the Studies Reported in the Literature on the Vitamin A and Carotene in Human Blood Which Are Most Pertinent to This Study

Investigator	Subjects	Most Pertinent Observations
Connor, C. L.: Studies on Lipochromes, <i>J. Biol. Chem.</i> 77 : 619-626 (May) 1928	3 normal 18 diabetic 36 miscellaneous	Carotene varied from 0.0 to 0.11 mg. per 100 cc.
White, F. D., and Gordon, E. M.: Estimation of Serum Carotene, <i>J. Lab. & Clin. Med.</i> 17 : 53-59 (Oct.) 1931	14 diabetic 18 normal 8 pathologic not diabetic	The blood of the diabetic contained more carotene than that of the nondiabetic. The carotene in the blood depended on the amount in the diet
Menken, J. G.: Die Bestimmung des Vitamin A-Gehaltes im Blutserum des Menschen, <i>Deutsche med. Wchnschr.</i> 58 : 1494 (Sept. 16) 1932	100 subjects of varying socio-economic status	The blood from the low socio-economic group showed much less carotene and vitamin A than that from the middle group; the amount of vitamin A and carotene in the blood is related to the amount in the food
Kauffman, F., and von Drigalski, W.: Untersuchen über Carotin-Vitamin A im menschlichen Organismus, <i>Klin. Wchnschr.</i> 12 : 306-309 (Feb. 25) 1933	1,000 subjects	55 per cent of the subjects showed less than 0.01 mg. per 100 cc. of carotene. Improvement of diet caused a rapid increase in the carotene in blood
Chesney, Jack, and McCoord, A. B.: Vitamin A of Serum Following Administration of Haliver Oil in Normal Children and in Chronic Steatorrhea, <i>Proc. Soc. Exper. Biol. & Med.</i> 31 : 837-838 (April) 1934	Children, normal and celiac	In normal children a concentrate of vitamin A caused a rapid rise in the amount in the blood; a maximum about 9 times the fasting level was reached in 4 hours; after 24 hours the level was still 50 per cent above the original fasting level
Wendt, H.: Beiträge zur Kenntnis des Carotin und Vitamin A-Stoffwechsels, <i>Klin. Wchnschr.</i> 14 : 9-14 (Jan. 5) 1935	More than 50 normal diabetic hyperthyroid	The maximum blood level reached after a supplement of vitamin A or carotene was dependent on the original blood level but was not maintained when large supplements were continued
Schneider, E., and Widmann, E.: Der Carotin und Vitamin A Spiegel im menschlichen Serum, <i>Klin. Wchnschr.</i> 14 : 670-673 (May 11) 1935	100 subjects, aged 10-80 years	Carotene tended to rise with age and vitamin A to fall
Wolf, L. K.: Die chemische Bestimmung der Vitamine A und C im Blut, Harn, Organen, und Lebensmitteln, sowie ihre Bedeutung für die Ernährungsfrage, <i>Schweiz. med. Wchnschr.</i> 66 : 979-985 (Oct. 10) 1936	40 students 07 patients 80 unemployed	The unemployed showed the lowest blood values; suggested standards: good, 60-80 international units per 100 cc. serum; satisfactory, 20-60 international units; unsatisfactory, less than 20 international units
Sie, B. L.: Untersuchen über den Vitamin A Gehalt des Blutes von Einigen Patienten mit A-Avitaminotischen Augensymptomen, <i>Arch. f. Augenh.</i> 110 : 610-619, 1937	10 with avitaminosis A, 30 normal	The blood values for the patients with ocular symptoms of hypovitaminosis A were significantly low
Marchionini, A., and Patel, C.: Klinische und experimentelle Untersuchungen über den Vitamin A und Carotengehalt des menschlichen Blutserums bei Hautkrankheiten, <i>Arch. f. Dermat. u. Syph.</i> 175 : 419-437 (April) 1937	159 normal 145 with cutaneous disorders	A much higher incidence of low values was found in the subjects with cutaneous disorders
Dost, F. H.: Zur Methodik der Stufenphotometrischen Bestimmung des Vitamins A im menschlichen Blut, <i>Klin. Wchnschr.</i> 16 : 273-275 (Feb. 20) 1937	15 sick children 10 normal	Found lower values for the sick children
deHaas, J. H., and Meulemans, O.: Vitamin A and Carotenoids in Blood Deficiencies in Children Suffering from Xerophthalmia, <i>Lancet</i> 1 : 1110-1111 (May 14) 1938	11 infants and 17 children with xerophthalmia	No, or very little, vitamin A was found in the blood of these subjects. A supplement increased the vitamin A more or less rapidly
Clausen, S. W., and McCoord, A. B.: The Carotenoids and Vitamin A of the Blood, <i>J. Pediat.</i> 13 : 635-650 (Nov.) 1938	Over 1,400 subjects mostly children; various pathologic conditions	(1) Individual determinations vary greatly; (2) the rate of absorption of vitamin A is slower than that for carotene; (3) infection causes a decrease in vitamin A and carotene; (4) when the carotene intake is diminished the blood level falls slowly

A over a long enough period to determine the expected variation. The present study was undertaken as a contribution to this problem.

METHOD

The general plan of the study, as previously stated, was to place a group of subjects on a diet as low as possible in vitamin A and to note the effect of such a diet, with and without small supplements, on the blood level of vitamin A and carotene and on the biophotometer readings. To support these data single samples of blood were taken from thirty-four adults, half of whom had been receiving a supplement of vitamin A.

Subjects.—Four subjects were used to test the effect of a vitamin A low diet on the blood level of carotene

made to secure some idea of their dietary histories, the records were not quantitative and therefore were of little value in ascertaining the amount of vitamin A that these subjects had been consuming, except in the case of those who were taking concentrates. Thirty-one of these thirty-four subjects were given two or more biophotometer tests each.

Plan of the Experiment.—The experiment consisted of a long depletion period, 123 days, which was preceded and followed by a week of an adequate diet containing between 7,000 and 10,000 units of vitamin A daily. During the depletion period the subjects ate all their meals in the laboratory. While no assays were run, the diet as calculated averaged 67 units of vitamin A daily. All the food eaten, including the breads and cakes, was prepared in the laboratory. The diet was

weighed and each subject ate identical amounts of any food which contained vitamin A or carotene.

Three of the subjects continued on this vitamin A low diet for the entire period of more than four months, the fourth subject for fifty-two days. The three subjects each received six small supplements² of 1,000 units of vitamin A, the first on the sixty-fifth, the others on the seventy-second to the seventy-sixth days. The fourth subject, E. S., was given 2,000 units daily during her last week on the experiment.³

The blood samples for the study were taken in the morning before breakfast. Samples were taken twice a week from the four subjects on the depletion diet and once a week from the control subject. When supplements were being given, the blood was taken at least twenty hours after the supplement had been administered.

Each of the four subjects was tested daily on the biophotometer during the first seventy-two days of the study and at frequent intervals thereafter. The control subject was also given frequent biophotometer tests throughout the study.

Determination of Carotene and Vitamin A.—The method used for determining the vitamin A and carotenoids in the blood was that described by Clausen and McCoord.⁴ The essentials of the method are as follows:

Three cc. of serum or plasma is used for a determination. The proteins of the serum are precipitated by 95 per cent alcohol, which has been shown to help in releasing the vitamin A so that it can be more easily extracted. Three cc. of petroleum ether is used for extracting the vitamin A and the carotenoids. One cc. of this petroleum ether extract is used for the determination of the carotenoids and a second one for vitamin A.

In determining the carotenoids the petroleum ether is evaporated and equal portions of two immiscible solvents hexane and diacetone alcohol are added. The carotenoids present are thus separated into a "xanthophyll" and a "carotene" fraction because of their difference in solubility in these two solvents. The amount of carotenoid in each fraction is determined colori-

metrically against a 0.02 per cent potassium dichromate standard and the results are expressed as gamma of "carotene" and gamma of "xanthophyll" per hundred cubic centimeters of serum.

The vitamin A is determined by a modification of the Carr-Price antimony trichloride method. The blue color is read in a colorimeter against a 10 per cent copper sulfate standard. The blue units obtained are corrected for the carotene and xanthophyll present and are expressed as blue units⁵ of vitamin A per hundred cubic centimeters of serum.

It is recognized that small amounts of other carotenoids are probably in both the "carotene" and

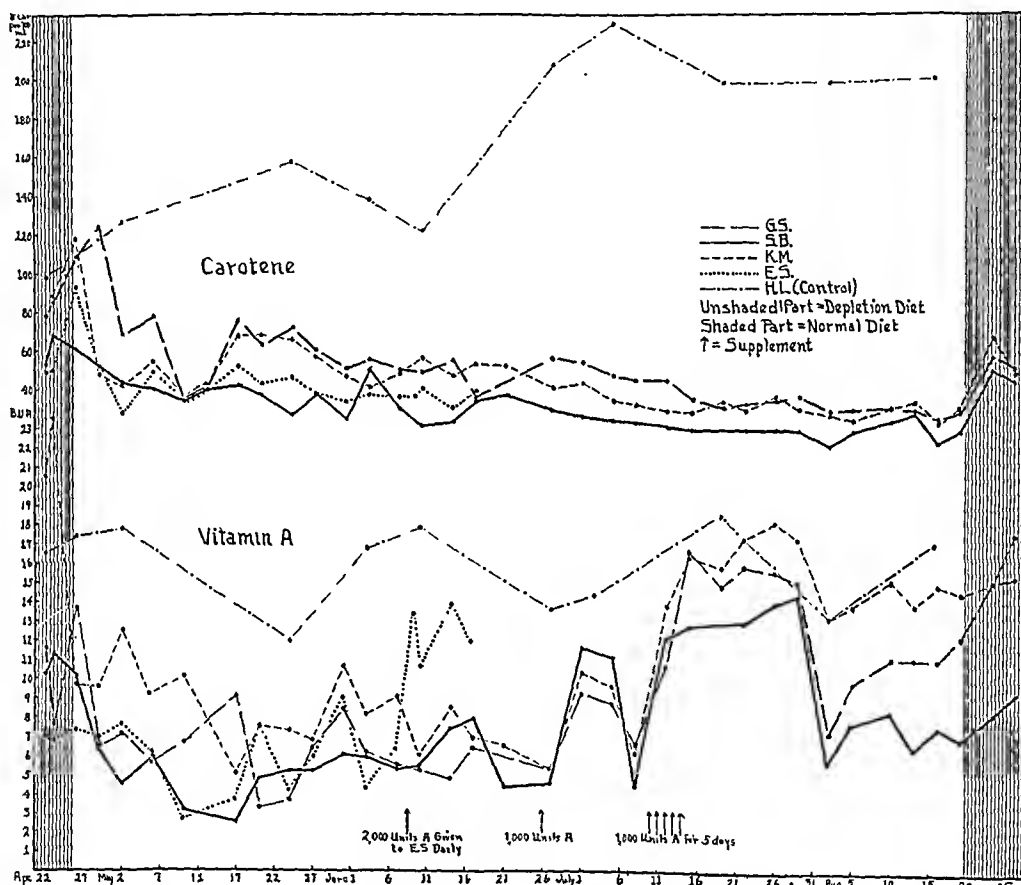


Chart 1.—The amount of carotene and vitamin A in each sample of blood from each subject.

"xanthophyll" fractions and that the blue color produced with antimony trichloride is not due to vitamin A alone. The limitations of the method are discussed in publications from the Rochester laboratory and so will not be reviewed here.⁶ Suffice it to say that the major portion of the color in each instance is due to the substances under consideration; namely, carotene and vitamin A. Furthermore, the errors in the method are minimized in a study of this type, which consists chiefly of repeated determinations of the blood values of subjects on a constant diet, the only variable being an increase or decrease in the vitamin A supplement. No serious misinterpretations of the data should be involved if the values are treated not as absolute but as relative ones and if small changes are regarded as insignificant.

2. The supplement was given as U. S. P. reference cod liver oil.
3. It was necessary for E. S. to leave the city; hence the shorter length of time on the study.

4. Clausen, S. W., and McCoord, A. B.: The Determination of Carotene and Xanthophyll by a Single Distribution Between Liquid Phases, *J. Biol. Chem.*, **113**: 89-104 (Feb.) 1936. Clausen and McCoord.⁵ McCoord and Luce-Clausen.¹

5. The values reported for both carotene and vitamin A will be given as the amounts in 100 cc. of serum.

6. Clausen and McCoord (footnotes 1 and 4)

RESULTS

Vitamin A and Carotene in the Blood.—As previously stated, samples of blood were taken from the four experimental subjects twice a week and from the control subject once a week throughout the study, thus making a total of thirty-six determinations for three subjects, twelve for the fourth and eleven for the control. The results of the determinations of both vitamin A and carotene are shown in chart 1.

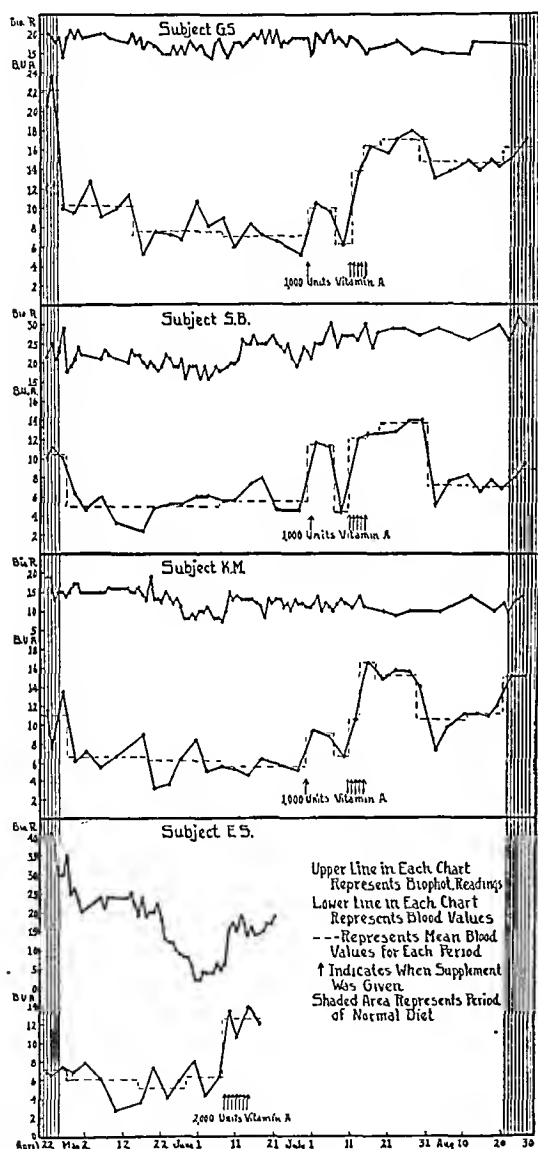


Chart 2.—Biophotometer readings and vitamin A in the blood of each subject during the study.

It will be noted that the average amount of vitamin A in the fasting blood of the subjects at the beginning of the study ranged from 7.1 blue units for the lowest subject (E. S.) to 22.1 blue units for the highest (G. S.), and the carotene ranged from 60 to 85 micrograms per hundred cubic centimeters of serum. The original levels of vitamin A in the blood of these subjects fits in well with their dietary histories, at least as far as the extremes are concerned. Subject G. S., who had a history of large amounts of vitamin A supplement, showed the highest value and subject E. S., whose dietary history was slightly inferior to the others, the lowest. The blood levels of all the subjects were well within the

range of values found by Clausen in the blood of children, but three (11.0, 10.5 and 7.1 blue units) tended to be near the lower limit of the range, where he states the majority of his subjects fall; namely, between 10 and 20 blue units. Since, however, these determinations were all made on fasting blood, they might well be expected to be somewhat lower than those reported in the literature on nonfasting blood. It seems only logical to assume that a meal taken several hours before blood was drawn would affect the amount of vitamin A in the blood, since it has been shown that a supplement of vitamin A causes a maximum rise of as much as 900 per cent in four hours.⁷ The fact that these subjects were adults while most of Clausen's subjects were children may also account in part for the level of vitamin A and carotene tending to be low. While the subjects had fairly good diets, these diets were probably relatively lower in vitamin A than are those of the modern child. It will be shown later that subject E. S., who showed the lowest value (7.1 blue units), may have had suboptimal stores of vitamin A. In general, then, these data on the original levels of vitamin A in the blood of the subjects were in good agreement with their dietary histories and with values reported in the literature.

Another point of interest in chart 1 is the variability in the determinations of various samples of blood from the same individuals. This tendency for the level of vitamin A in the blood to vary has been mentioned by most workers in the field; its occurrence in a study of this type, in which the subjects were on a practically constant diet and only fasting blood was used, was unexpected. There was slightly greater variation between the amounts of both vitamin A and carotene in the blood from the control than in that from the experimental subjects. This is probably explained by the fact that her intake of vitamin A and carotene varied, while the experimental subjects were on a constant diet.

One of the most important observations in chart 1 is the marked fall in the vitamin A and carotene level of the blood caused by the depletion diet. The greatest decrease was noted in subject G. S., who had the highest original level (from 22.1 to 7.1 blue units), and the smallest in subject E. S., who had the lowest original level (from 7.1 to 5.0 blue units). A tendency is noted for the vitamin A in the blood of all the experimental subjects to approach that of the lowest subject; namely, 6.0 blue units per hundred cubic centimeters of serum. The values for the control subject varied from 11.5 to 18.9 blue units, with a mean of 15.5; but, as would be expected, there was no consistent tendency for them either to increase or to decrease throughout the study.

The effect of a supplement of vitamin A on the amount in the blood may be observed in this chart by noting the sections marked with arrows to designate when the supplement was given. It will be seen that, beginning with the forty-fifth day of the depletion diet, subject E. S. was given 2,000 units of vitamin A a day for seven days, while the other three subjects were given no supplement until the sixty-fifth day and then only a single 1,000 units capsule.² The supplement given E. S. caused a rapid rise in her blood level of vitamin A from an average of 6.0 blue units for the depletion period to 12.5 blue units, a value appreciably higher than that found in her blood during the preliminary period (7.1 blue units). The first supplement

7. Chesney and McCoord.¹

given to the other three experimental subjects was only 1,000 units, but even this small amount caused a decided rise in the vitamin A in the blood of all the subjects. This is of special interest in light of the fact that the supplement was taken twenty-three hours before the blood was drawn. After this one small supplement of vitamin A the amount in the fasting blood fell slowly and by the end of the week had reached its original low level. When the same small supplement of 1,000 units

TABLE 2.—The Range, Mean and Standard Deviation of the Determinations of the Vitamin A and Carotene in the Blood of Thirty-Four Adults, One Half of Whom Had Received a Supplement of Vitamin A

Classification of Subjects	Number of Subjects	Micrograms of Carotene per 100 Cc. of Serum			Blue Units of Vitamin A per 100 Cc. of Serum		
		Mean	Standard Deviation	Range	Mean	Standard Deviation	Range
Subjects who had taken no supplement.....	17	115	31.3	82-210	9.1	2.6	4.8-14.0
Subjects who had taken a supplement.....	17	130	41.9	58-250	15.8	3.0	11.7-20.8

was again given for two days, a greater increase in vitamin A in the blood occurred, and when given for three additional days a still higher level was attained. The amount of vitamin A in the blood of all the subjects was maintained at a high level for two weeks after the supplement was discontinued and then slowly fell.

Although the vitamin A low diet was continued for forty-two days after the supplement was stopped, in only one case did the vitamin A in the blood fall to as low a level as that in the first part of the study. In two subjects, S. B. and K. M., the rise in vitamin A in the blood caused by the supplement resulted in a higher level than that observed at the beginning of the study when the subjects were on a normal diet. The fact that the blood level rose so high and fell so slowly after a supplement of only 1,000 units of vitamin A a day is difficult to explain. These subjects, even with the addition of the supplement, were still getting much less vitamin A than during the preliminary period, following which the blood level had fallen rapidly. Furthermore, 1,000 units of vitamin A is less than the suggested minimum requirement for human beings.

The fact that in the ordinary mixed diet the major portion of vitamin A value is furnished by carotene may have some bearing on the problem. The amount of vitamin A per se in the preliminary diet, however, was probably well over 1,000 units, although it is impossible to calculate just how much of the total vitamin A value was in this form as assays of foods are done by the biologic method, which does not differentiate between carotene and vitamin A. The main animal sources of vitamin A in the preliminary diet were dairy products and eggs, both of which may vary greatly in their carotene content as well as total vitamin A value. There is, therefore, the possibility that the preliminary diet may have contained less vitamin A and more carotene than an inspection of it would indicate. The data, however, clearly show that even a small supplement of vitamin A caused an increase in the amount of this substance in the fasting blood of the subjects on a vitamin A low diet and that this increase was main-

tained for an appreciable length of time. Furthermore, the increase in blood value and the period the increase was maintained were both roughly proportional to the amount of supplement given.

The carotene values of the blood were apparently not affected by the supplement of vitamin A, as they became progressively lower throughout the study until an adequate diet was resumed. What little vitamin A the experimental diet contained was from vegetable sources, so that it is not surprising that the blood always showed a small amount of this pigment. The carotene in the blood of the control subject, however, increased during the study. This may have been due to the fact that the study was carried on during the spring and summer when more fruits and vegetables were in season, or that she unconsciously chose foods higher in carotene because she knew that she was serving as a control for the study.

The amount of vitamin A and carotene in the blood of the thirty-four subjects from whom single samples of blood were obtained are shown in table 2 and chart 3. These subjects consisted of two groups; one half of them had been taking a supplement of vitamin A for three weeks while the other half had no supplement. There was a significant difference in the amount of vitamin A in the blood of the subjects in the two groups, as is evidenced by the fact that the mean value for those taking the supplement was 15.8 blue units per hundred cubic centimeters of serum and the standard deviation 3.0 blue units, while the mean value for the other group was 9.1 blue units, the standard deviation 2.6 blue units. There was, however, some overlapping in the values for the two groups, as the range for the supplemented group was from 11.7 to 20.8 blue units, that for the unsupplemented group from 4.8 to 14.0 blue units. This is not surprising in view of the fact that the diet histories of some of the subjects in the unsupplemented group showed very generous amounts of vitamin A and carotene.

As might be expected, there was less difference in the mean values and range of values for carotene in the

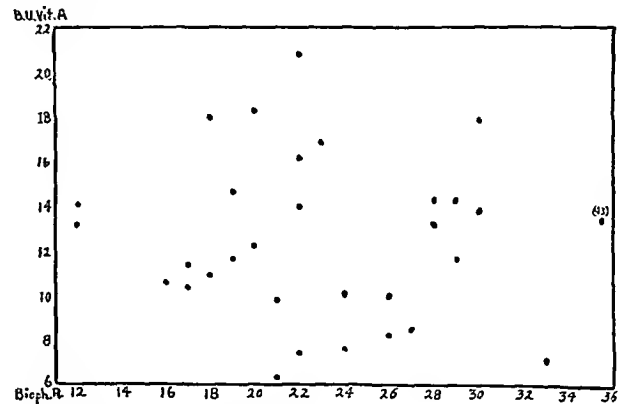


Chart 3.—Scatter diagram of the biophotometer readings and vitamin A blood values of thirty-one adults.

two groups than for vitamin A. It is interesting, however, to note even a small difference in the mean carotene values for the supplemented and unsupplemented group, 130 versus 115 micrograms of carotene, since the supplement taken by the subjects was not carotene but a product containing vitamin A.

In summary, then, this study, which includes repeated determinations of the amount of vitamin A and carotene

in the fasting blood of subjects on a vitamin A low diet for a period of four months, shows the following:

1. The original level of vitamin A in the blood of the subjects was related to their dietary histories.
2. The blood values of vitamin A fell rapidly when the subjects were placed on a vitamin A low diet, although there was considerable variation noted between individual determinations.
3. Small supplements of vitamin A caused the amount of this substance in the blood to rise rapidly but had no effect on the carotene.
4. The vitamin A blood level reached after a supplement and the length of time that this level was maintained were both affected by the size of the supplement given.
5. The average amount of vitamin A in the fasting blood of subjects receiving a supplement of vitamin A was significantly higher than that of subjects who had no supplement.

Relation Between Vitamin A in the Blood and Biophotometer Readings.—Since it has been claimed that the biophotometer test is an index of a subject's nutritional status as regards vitamin A, it is interesting to compare the trend of the biophotometer readings and vitamin A in the blood of these subjects. The method followed in giving the biophotometer tests was that described by Jeans and his associates.⁸ Only the readings for the first test in the recovery period are reported here, as in every case these readings reflected the general trend of the test as a whole. Chart 2 shows the individual biophotometer readings, in dial spaces, for this point in the test and the amount of vitamin A in the blood of each subject plotted according to time.

Attention is directed first to the upper three charts, those of subjects G. S., S. B. and K. M. It will be noted that there is no relationship between the original biophotometer readings and the amount of vitamin A in the blood, nor is there any tendency for the two to parallel each other as the study progresses. Although the biophotometer tests vary from reading to reading, their general trend is surprisingly uniform. One cannot, in fact, tell from them when the subjects were receiving a supplement, when they were on a deficient diet or when they were on an adequate diet. In contrast to these the lower lines, which represent the blood values, show definite drops and rises coincident with the withdrawal or restoration of vitamin A to the diet. The trend of these is definitely affected by the amount of vitamin A in the diet.

In the fourth chart, that of subject E. S., it will be noted that the vitamin A low diet and subsequent supplement did have a decided effect on the biophotometer readings. The fact that this subject showed impaired dark adaptation after forty-five days on the depletion diet indicates that her stores of vitamin A may have been suboptimal. If this assumption is correct, her original low blood value of only 7.2 blue units of vitamin A per hundred cubic centimeters of serum might be considered as indicative of low stores; her original biophotometer readings, however, were the highest of any of the subjects and would therefore have to be considered of no diagnostic value.

Further comparisons of vitamin A in the blood and biophotometer readings can be made from data from thirty-one of the group of thirty-four subjects studied who were each given two or more biophotometer tests.

Chart 3 shows a scatter diagram in which the blood values of vitamin A and the biophotometer readings for these subjects are plotted. It will be noted that the data represented cover a wide range of values but that there is no tendency toward a correlation. It is clearly evident, therefore, that here, as in the case of the four subjects on the depletion diet, there is no relationship between biophotometer readings and the amount of vitamin A in the blood.

In a study reported elsewhere of the reliability and validity of the biophotometer test, of which this study was a part, we have shown that while there is no doubt some relationship between the biophotometer readings and the nutritional status of the subject with respect to vitamin A, the relationship is not close enough to make the test of use as a diagnostic measure. Therefore the lack of relationship between the biophotometer test and the blood values reported here furnishes no evidence as to whether the blood values are related to the vitamin A stores of an individual. It is evident, however, in the case of the five subjects studied most extensively, that the original blood values agree better with the dietary histories of the subjects than do their biophotometer readings and that the fasting blood level responds more quickly to changes in vitamin A intake than do the biophotometer readings.

COMMENT

From this study it is evident that the amount of vitamin A in fasting blood is directly affected by the amount in the diet. It is obvious, moreover, that the fasting blood level must reflect not only the diet of the preceding day but to some extent the habitual level of intake. This is shown by the following: 1. The original blood levels of the four subjects on the depletion study were in the same order as the amount of vitamin A they were in the habit of eating, as judged by their dietary histories, even though they had been on similar diets for a week previous to the time the blood was drawn. 2. The depletion diet caused a decrease in the amount of vitamin A in the blood of all the subjects, but an appreciable period of time elapsed before their blood values reached the same low level. 3. The subject with the lowest original blood value was the only one of the four for whom there was any evidence of impaired dark adaptation on the depletion diet. 4. A small supplement of vitamin A added to the depletion diet caused an immediate rise in the amount found in the fasting blood, but the withdrawal of the supplement did not cause an immediate fall. 5. The blood from the seventeen subjects who had been receiving a vitamin A supplement contained more vitamin A than that from the unsupplemented subjects. This interpretation of the blood values is also supported by the evidence from the literature, namely, that higher blood values were obtained in subjects from a high than from a low socioeconomic status, and subjects showing clinical symptoms of vitamin A deficiency as a rule had very low blood values.

The acceptance of this contention that the vitamin A in fasting blood is partially dependent on the amount eaten the previous day and partially on the past diet does not, however, answer the crucial question of whether or not blood studies can be used as a measure of nutritional status in respect to this vitamin. Several observations made in the present study make it clear that the blood level at any given time does not necessarily reflect the body's stores. This is illustrated in

8. Jeans, P. C.; Blanchard, Evelyn, and Zentmire, Zelma: *Dark Adaptation and Vitamin A*, J. A. M. A. 108: 451-458 (Feb. 6) 1937.

the case of G. S. For several months preceding the study she had been supplementing an already adequate diet with large amounts of vitamin A concentrates and her stores should theoretically have been filled. Nevertheless, when placed on the depletion diet, her blood level fell rapidly and at the end of two months was approximately the same as that of the other subjects. Thus her blood level at this point in the study would have indicated that her stores were no better than theirs, while actually they should have been far better.

The same lack of relation between blood level and theoretical vitamin A stores is shown by the response to the supplement. Following a total addition of only 6,000 units of vitamin A, or little more than a normal day's intake, the amount in the blood of three of the subjects rose above the original level and remained there for several days in spite of the fact that the subjects had been on a vitamin A deficient diet for from forty-five to sixty-five days, and their stores should presumably have been at least partially depleted.

Even though the blood levels of vitamin A cannot be relied on to reflect the stores when abrupt changes are made in the dietary, nevertheless the data from this study and those in the literature would indicate that the blood level for vitamin A of subjects on their usual diet, if observed over a reasonable period, might give some indication of the subject's reserves of this vitamin. It appears obvious that if fairly large amounts of vitamin A are consistently found in the blood of a subject (e. g., 16 blue units or more) there is little doubt that his diet, and consequently his stores, contain generous amounts. Conversely, if low amounts are consistently found (e. g., less than 6 blue units) it would probably indicate that the body stores of the vitamin were in the process of being depleted. The determination of the vitamin A in a single sample of even fasting blood from any one individual would have little significance in either case, as it might easily be affected by the intake of the previous day and might not be truly representative of the diet as a whole.

If the biophotometer had proved to be a more sensitive and reliable means of determining mild vitamin A deficiency, the data presented would have been easier to interpret. In that case one would have expected to find a positive relationship between the biophotometer readings and the blood studies, provided of course that they both were related to the nutritional status of the subjects. Since, however, the biophotometer was shown to be of little use except in the case of quite marked dysadaptation, it was of no help in this problem.

While the data presented help to clarify several of the problems involved in the interpretation of levels of vitamin A in the blood, further research is necessary before their significance in relation to nutritional status can be fully understood.

SUMMARY

Semiweekly determinations were made of the amount of vitamin A and carotene in the blood of four experimental and one control subject during a four months depletion study. The conclusions from these data were supported by those from single determinations of these constituents in the blood of thirty-four adults, one half of whom had received a supplement of vitamin A. Biophotometer readings were made of the subjects during the depletion diet and of thirty-one of the other subjects.

The results of the study show that the amount of vitamin A in the fasting blood is dependent on the

amount in the diet. While the evidence as to whether or not determinations of the vitamin A in the blood are of value in judging nutritional status is contradictory, the data show that consistently low fasting blood values indicate that probably the body stores of vitamin A are being depleted and very high values that the intake of vitamin A is adequate. The results further show that there is no correlation between the amount of vitamin A in the blood and the biophotometer readings.

HYPERPARATHYROIDISM AND PREGNANCY

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The concept of disease caused by increased function of parathyroid tissue has been firmly established since Mandl's¹ successful removal of a parathyroid adenoma for osteitis fibrosa cystica in 1925. During the past thirteen years, more than 150 well studied cases of hyperparathyroidism have been reported and much has been added to our knowledge of the disease. However, a review of the literature revealed only one report dealing with pregnancy in a patient with hyperparathyroidism.² It is our purpose in this communication to record such a case and to discuss the interesting problem that it presents.

REPORT OF CASE

History.—A woman aged 29, an American-born dancer, was admitted to Mount Sinai Hospital with chronic hyperparathyroidism on Sept. 19, 1938, in the fourth month of her first pregnancy. Her family history was negative. She was a seven months infant weighing 5 pounds (2,268 Gm.) at birth. Her early history was uneventful.

Her past history is a good example of the course of chronic hyperparathyroidism.³ She enjoyed good health until she was 19 (1928), when attacks of renal colic caused her to enter another hospital, where two calculi were removed from the right ureter. Two years later (1930) a cherry-sized mass, which had appeared during the preceding three months, was excised from the left maxilla. This was a giant cell tumor. Shortly afterward she passed a left ureteral calculus without operative intervention.

In 1931 she fractured the right humerus. X-ray films showed a bone cyst involving the head and neck of the humerus in addition to a fracture of the surgical neck. The rest of the skeleton was normal. In 1935, on her sixth admission to the same hospital, she presented a painless swelling of the left lower jaw. Except for occasional vague pains in the extremities she had been perfectly well and continued an active life as a dancer. Roentgenograms of the entire skeleton now revealed generalized osteitis fibrosa cystica. The blood calcium was high, the inorganic phosphorus low and the serum phosphatase elevated. These observations led to a thorough but unsuccessful exploration of the patient's neck for a parathyroid adenoma. The bone cyst in the left mandible was excised for cosmetic reasons. This resulted in a sizable defect, which was filled with a bone graft in June 1938. Pathologic examination of a piece of rib removed for the graft showed osteitis fibrosa cystica.

From the Gynecological Service of Dr. Samuel H. Geist and the Division of Laboratories of the Mount Sinai Hospital.

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3. The details of the past history were made available to us by Dr. William F. MacFae.

In June 1938 the patient became pregnant. Previously her menstrual periods had always been regular and normal in every respect. She continued to feel well until the onset of nausea and vomiting during the third month. At this time she began to have an aching pain in both heels. She consulted a physician, who sent her to the Mount Sinai Hospital to have the proper management of her pregnancy determined.

Examination.—On admission the patient was thin and appeared chronically ill. There were no gross deformities. The hair was thin and silky. The nails were brittle and ridged. The skin was clear and of normal texture. There were many well healed operative scars. The lower incisors were very loose. Several teeth were missing. The blood pressure was 110 systolic, 70 diastolic. The only other abnormalities were those of early pregnancy. The vaginal mucosa was cyanotic, the cervix was soft and nulliparous and the mobile uterus was enlarged to about 3½ months. Hegar's sign was positive.

Examination of the blood revealed hemoglobin 72 per cent, red blood cells 4,200,000, white blood cells 9,800, polymorphonuclear leukocytes 70 per cent, lymphocytes 26 per cent, monocytes 4 per cent. The urine was neutral to acid and cloudy, contained albumin, clumps of white blood cells, rare red blood cells and granular calcium phosphate casts⁴ on repeated examinations, had a specific gravity which varied from 1.012 to 1.024, and a concentration test (Fishberg) showed a maximum concentrating power of 1.024. A phenolsulfonphthalein test (following hysterotomy) showed 75 per cent excretion of the dye in two hours.

Results of the chemical analysis of the blood are given in the accompanying table.

Results of Chemical Analysis of the Blood

	During Pregnancy		After
	9/22/38	9/26/38	Hysterotomy 10/10/38
Urea nitrogen per 100 cc.....	8 mg.	7 mg.	.....
Sugar per 100 cc.....	75 mg.	.....	.....
Calcium per 100 cc.....	11 mg.	11.9 mg.	14.4 mg.
Phosphorus per 100 cc.....	2.4 mg.	2.6 mg.	2.7 mg.
Phosphatase	90 King	.....	64.5 King
	Armstrong units		Armstrong units
Total protein per 100 cc.....	3.1 Gm.	3.2 Gm.	5.0 Gm.

The following hormone assays were reported (courtesy of Dr. Robert T. Frank): Normal pregnancy test: six day specimen of urine (from September 22 to 27) showed a three day estrogen output of $\frac{6,000 \text{ international units combined}}{1,250 \text{ international units free}}$; second specimen for a three day period $\frac{11,750 \text{ international units combined}}{3,000 \text{ international units free}}$; blood estrogen 100 international units per liter; urine gonadotropic (III) reaction 2,000 rat units per liter; blood gonadotropic (III) reaction 3,000 rat units per liter.

The Hamilton-Highman test⁵ for abnormal amounts of parathyroid extract in the blood gave negative results.

Metabolic Data: On a neutral ash diet, containing approximately 100 mg. of calcium daily, the patient had a urinary excretion of 1,293 mg. of calcium for a three day period, an average of 431 mg. daily (normal, from 80 to 100 mg. per day).⁶ After abdominal hysterotomy the urinary calcium increased slightly to 465 mg. daily on the same diet. To simplify the balance studies the calcium in the stool was not determined, since in hyperparathyroidism without renal insufficiency only urinary excretion of calcium is excessive.⁷

Röntgenograms: The long bones showed diffuse decalcification. Both humeral heads were cystic (fig. 1). There were similar but less well defined changes in both tibias. The pelvis showed large lacunar areas in the innominate bones. There was a generalized decalcification of the pelvic bones with a coarsening of the trabecular structure (fig. 2). The lower ribs showed similar changes.

The skull showed a diffuse thickening of the bones of the calvarium, especially at the outer table. The bones of the skull had an irregular mottled appearance simulating the so-called cotton-wool picture (fig. 3). The mandibles showed cystic areas on both sides. There was a cyst in a recent bone graft.

A flat plate of the abdomen showed three small concretions, which may be renal calculi, within the contour of the left kidney. The kidneys were normal in size, shape and position. X-ray films of the chest showed no abnormality in the lungs. There was no mediastinal tumor.

Course.—During her stay in the hospital, the patient was symptom free and tolerated the test diets well. She lost about 1 pound (450 Gm.) during the first balance study. Eight days after admission, abdominal hysterotomy was performed for reasons discussed later. The patient was delivered of a well formed fourteen weeks fetus. The postoperative course was uneventful. The patient was afebrile except for a slight postoperative temperature rise to from 101 to 102 F. for two or three days. She was discharged three and one-half weeks after admission.

THE FETUS

The specimen was a well formed fetus measuring 15 cm. from crown to heel. The weight was 78 Gm. X-ray films showed normal osseous development for a twelve to sixteen week fetus.⁸ There was no evidence of metastatic calcification.

The bones were examined microscopically, with material fixed in solution of formaldehyde or in Zenker's fluid and stained with von Kossa solution or hematoxylin and eosin. Sections through the humerus revealed straight thin primary zones of calcification (cartilage-shaft junction) with an orderly arrangement of thin calcified cartilage cores covered with bone on the shaft side. The subepiphyseal zone was vascular and contained a fair number of osteoclasts. The diaphysis was well developed and was composed of anastomosing trabeculae separated by spaces containing blood-forming marrow. Everywhere trabeculae were covered by osteoblasts. The osteogenic layer of the periosteum consisted of an unbroken line of osteoblasts. There was no evidence of marrow fibrosis or excessive osteoclastic activity. Osteoblastic function seemed normal. Sections stained for calcium (without decalcification) showed no impairment of calcium deposition in formed bones. Sections of the radius, ulna, tibia and metacarpal revealed similar changes. The impression was that of normal developing bone.

The parathyroids were identified on serial sections of the organs of the neck. Three glands lay posteromedial to the thyroid and one within the substance of the thyroid. Each was a round compact structure composed of closely packed cells with clear, unstained cytoplasm and round vesicular nuclei. There was a slight tendency to form alveoli. The glands showed no evidence of fibrosis or hemorrhage. The impression was that of normal developing parathyroid tissue.⁹

COMMENT

This case satisfies the clinical and metabolic criteria of hyperparathyroidism discussed at length in many reviews.¹⁰ The onset with renal calculi, the gradual appearance of osteitis fibrosa cystica, the demonstra-

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tion of an excessive urinary excretion of calcium as well as hypercalcemia, hypophosphatemia and elevated serum phosphatase afford ample proof of increased parathyroid activity. The failure to find abnormal parathyroid tissue at operation is not unusual, considering the variability in the number and location of the human parathyroids.¹¹ "A positive diagnosis is a challenge to the skill and patience of the surgeon, and when these have been exhausted in a fruitless search for an adenoma, the operator is privileged to say 'the tumor cannot be found' but not 'the tumor does not exist.'"¹²

The decision to terminate this pregnancy was determined largely by the presence of extensive fibrocystic disease of the maternal skeleton associated with a negative calcium balance. This indication of moderately severe hyperparathyroidism led to the conclusion that it would harm our patient if she continued to bear the added metabolic burden of gravidity. We regret that we were unable to extend the period of observation to study the combined effect of increasing fetal mineral requirements and excessive maternal parathyroid function on the course and outcome of pregnancy.

The continuance of pregnancy with the patient in positive calcium balance was believed inadvisable in view of the tendency for diets rich in calcium, phosphorus and vitamin D to accelerate the development of serious renal complications of hyperparathyroidism.¹³ Likewise, reexploration for a parathyroid tumor during pregnancy was not attempted because it was felt that, even if the offending agent was found, its removal would endanger both mother and fetus by precipitating severe tetany.¹⁴ Thus a brief consideration of the possible effects of coexisting hyperparathyroidism and pregnancy will serve to justify abortion as the logical therapeutic measure.

An essential feature of hyperparathyroidism is the excessive excretion of calcium and phosphorus. The loss of calcium occurs chiefly in the urine, except in a few instances in which marked renal insufficiency increases the fetal calcium. The steady loss is associated with a reduction of the mineral content of the skeleton and the development of bone changes. These vary from mild osteoporosis, difficult to detect by roentgenograms, to severe osteitis fibrosa cystica, depending probably on the duration and intensity of the abnormal endocrine stimulus. In advanced cases the normal rigidity of the skeleton is lost. Fractures and deformities are common and may produce marked disability.

The steady depletion of her mineral stores limits the capacity of the pregnant woman with hyperparathyroidism to deal successfully with the fetal demand for calcium and phosphorus. This demand is of considerable magnitude, since the average term fetus contains about 25 Gm. of calcium.¹⁵ It has been estimated that there is a steady rise in the fetal absorption of calcium from 50 mg. a day at three months to 450 mg. a day during the tenth lunar month.¹⁶ During normal pregnancy, provided the diet is adequate, maternal retention of calcium exceeds the daily fetal requirements, except at

the tenth month, when the fetal need is almost double the average maternal retention and calcium must be withdrawn from the maternal reserves.¹⁶ In many instances, possibly as a result of inadequate intake or defects in calcium metabolism, the maternal tissues are called on to supplement the dietary supply of minerals still further, as shown by the not uncommon appearance of clinical phenomena during pregnancy referable to the drain of calcium from the mother.¹⁷ Osteomalacia is a good example of the effect of extreme deprivation of calcium and phosphorus on the course of pregnancy.¹⁸ This disease, characterized by softening and deformity of the bones, is common during pregnancy and lactation among populations whose diets are deficient in calcium, phosphorus and vitamin D. Under these circumstances the skeleton of the pregnant woman is demineralized by the intra-uterine parasite, which is often stillborn with evidence of fetal rickets.¹⁹

The case of Bever and Sorrentino² illustrates the effect of repeated pregnancies on a woman with hyperparathyroidism:

A woman aged 32 began to suffer from stabbing pains in both feet during the eighth month of her tenth gravidity. This pregnancy terminated successfully. During her eleventh pregnancy, one year later, there was an exacerbation of these pains, which spread to the thighs and upper extremities. She could not walk or sit down without severe pains. At term she gave birth to a dead fetus. During the subsequent months she felt very weak and lethargic. Clubbing of the fingers appeared. She again became gravid within a year. From the onset she could not move without severe pain and was completely bedridden. During the seventh month she fractured the left humerus while turning in bed. During the eighth month she sustained fractures of the right humerus, femur and clavicle, with the production of marked deformities. X-ray examination during the eighth month showed marked decalcification of the bones, which contained many large loculated cysts. The blood calcium was from 13.8 to 14.6 mg. per hundred cubic centimeters; inorganic phosphorus was from 2.9 to 3.1 mg. A negative calcium balance amounting to 400 mg. a day was demonstrated. The patient refused operation for removal of parathyroid tissue and gave birth to a normal baby girl whose bones showed no abnormalities on x-ray examination. Despite a resemblance to osteomalacia, this case was apparently one of hyperparathyroidism in view of the results of the x-ray and chemical examinations.

From the preceding data it is reasonable to conclude that pregnancy increases the damage to a skeleton whose mineral reserves have been depleted and whose ability to retain bone-forming materials is impaired by excessive parathyroid activity.

That pregnancy may be an etiologic factor in some cases of hyperparathyroidism is an interesting possibility suggested by the case of Bever and Sorrentino. Similarly, in the following reports, pregnancy seemed to be associated either with the onset or with an increase in the severity of unrecognized chronic hyperparathyroidism:

CASE 1.²⁰—A married woman aged 49, with bilateral renal calculi and generalized osteitis fibrosa cystica, was seen in 1929, ten years after she had begun to suffer from polyuria and polydipsia. She had one miscarriage at three months in 1918 and gave birth to a stillborn child just before the first symptoms of her illness in 1919. There were five other children living and well. A parathyroid adenoma was removed.

17. Coons, Callie Mae, and Blunt, Katherine: Retention of Nitrogen, Calcium, Phosphorus and Magnesium by Pregnant Women, *J. Biol. Chem.* 86: 1-15 (March) 1930. Hartley.¹⁴

18. Maxwell, J. P., and Turnbull, H. M.: Two Cases of Fetal Rickets, *J. Path. & Bact.* 33: 327-338 (April) 1930.

19. Maxwell, J. P.; Hu, C. H., and Turnbull, H. M.: Fetal Rickets, *J. Path. & Bact.* 35: 419-440 (May) 1932.

20. Hunter and Turnbull.¹⁰

11. Gilmour, J. R.: Gross Anatomy of the Parathyroids, *J. Path. & Bact.* 46: 133-149 (Jan.) 1938.

12. Churchill, E. D., and Cope, Oliver: The Surgical Treatment of Hyperparathyroidism, *Ann. Surg.* 104: 9-35 (July) 1936.

13. Johnson, J. L.: Experimental Chronic Hyperparathyroidism, *Am. J. M. Sc.* 183: 769-783 (June) 1932. Churchill and Cope.¹²

14. Hartley, E. C.: The Tetanoid Syndrome in Obstetrics, *Am. J. Obst. & Gynec.* 19: 54-63 (Jan.) 1930. Churchill and Cope.¹²

15. Givens, M. H., and Macy, Icie G.: Chemical Composition of Human Fetus, *J. Biol. Chem.* 102: 7-17 (Sept.) 1933. Job, Vivian, and Swanson, W. W.: Mineral Growth of Human Fetus, *Am. J. Dis. Child.* 47: 302-306 (Feb.) 1934.

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CASE 2.²¹—A woman aged 42 was seized with severe abdominal pain radiating to the back during the sixth month of her ninth gravidity. This was followed by a spontaneous abortion (stillbirth). During the next two years she gradually diminished in height and suffered from pain in both legs and difficulty in locomotion. A diagnosis of hyperparathyroidism was made then and a parathyroid adenoma was removed from behind the left pole of the thyroid.

CASE 3.²²—A woman aged 36 began to have attacks of renal colic during her fourth and last pregnancy. For the next four years she suffered from recurrent renal colic. Studies showed renal stones, blood changes suggestive of hyperparathyroidism and a negative calcium balance. A chief cell adenoma was removed from behind the right lobe of the thyroid. The patient made an uneventful recovery.

CASE 4.²³—A woman aged 23 was studied because her 5 months suckling infant suffered from severe tetany refractory to treatment. Except for vague tiredness during the previous few years, she was asymptomatic. Her blood calcium was found to be 16.4 mg. per hundred cubic centimeters, phosphorus 2.5 mg., phosphatase elevated and urinary calcium increased. X-ray examination showed granular calcium deposits in both kidneys; there was a small cyst in the left pelvic bone and another in the right femur. A parathyroid adenoma was removed.

CASE 5.²⁴—A multipara aged 40 gave a history of onset of severe epigastric pain for the first time during her first pregnancy at the age of 30. This recurred two years later during her second pregnancy. Both pregnancies terminated successfully. During the next three years she suffered from epigastric pain radiating to the back. This led to an examination which disclosed a compression of the eleventh dorsal vertebra and the metabolic manifestations of hyperparathyroidism. Operation for removal of parathyroid adenoma was unsuccessful. Biopsy was positive for osteitis fibrosa cystica. Since operation the patient has lost weight, suffers from intractable pain and has decreased several inches in height.

Several points support the suggestive case material and perhaps indicate a mechanism to explain the possible relationship between pregnancy and hyperparathyroidism. The disease is three times more common in women, in whom it occurs with greatest frequency after the age of 40.²⁵ We are unaware of a satisfactory explanation of this sex incidence. It is likely that many cases of hyperparathyroidism go unrecognized for many years, since the diagnosis is often obscure in early and mild cases.²⁶ Such cases afford ample opportunity for aggravating factors to exert their effects. Finally there is some evidence for a physiologic increase in parathyroid activity in response to the demands of normal gestation. Hyperplasia and increased vascularity of the parathyroids during pregnancy have been observed.²⁷ Moreover, several workers state that they have demonstrated abnormally large amounts of parathyroid extract in the blood of pregnant women during the last trimester.²⁸ It has been suggested that this increase in parathyroid function occurs to counteract the tendency for the blood calcium to fall during the last months of pregnancy by

liberating calcium from bone trabeculae or other sites of recent calcium deposit.²⁹

Parathyroid hyperplasia is encountered in a variety of conditions. Enlargement of the glands has been observed in rickets,³⁰ osteomalacia,³¹ renal dwarfism,³² chronic nephritis³³ and metastatic carcinomatosis of the skeleton.³⁴ Hyperplasia of the glands has been produced in rats by partial ablation of renal tissue.³⁵ In most of these states there is some evidence of increased parathyroid function. Excessive amounts of parathyroid extract have been detected in the blood in cases of rickets³⁶ and of chronic nephritis³⁷ and in a case of renal dwarfism.³² In each of these instances the parathyroid hyperplasia is probably compensatory to furnish increased amounts of hormone in response to calcium deficiency or hyperphosphatemia.

There are a few indications that compensatory hyperplasia occasionally gives rise to phenomena attributable to chronic hyperparathyroidism. In some cases of long standing renal insufficiency with secondary parathyroid hyperplasia a disease picture is encountered which is difficult to distinguish from primary hyperparathyroidism with renal complications.³⁸ An increase in the calcium content of the residual renal tissue of partially nephrectomized rats has been cited as evidence that the parathyroid hyperplasia produced by this procedure acts in a manner similar to excessive amounts of parathyroid extract.³⁹ Moreover, a tendency toward the formation of localized, apparently semiautonomous centers of excessive growth has been noted in the hyperplastic parathyroids of patients with chronic nephritis.⁴⁰

It is interesting that the diffuse parathyroid hyperplasia of rickets has been held responsible for the "relatively high incidence of hyperfunctioning parathyroid adenomas in England and New England, where the likelihood of vitamin D deficiency is favored by the indoor life of the industrial population."²⁵ According to this theory the presence of cell rests in the hyperplastic glands of rachitic patients forms the anatomic basis of the formation of adenoma. While this concept may explain the regional distribution of the disease, it throws little light on the question of sex incidence. In view of suggestive clinical evidence and certain disease-producing potentialities of parathyroid hyperplasia it is conceivable that pregnancy, with the introduction of factors enhancing parathyroid activity, may lead to permanent changes in the glands which precipitate and increase the severity of chronic hyperparathyroidism.

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25. Wilder and Howell.¹⁰

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The effect of hyperparathyroidism on the development of the fetus is worthy of careful study, since there are little accurate data on this point. Theoretically, two influences could produce fetal abnormality: (1) alterations in the availability of calcium and phosphorus for the formation of bone and (2) the direct action of the maternal parathyroid hormone on the embryonic tissues. Insufficient calcium and phosphorus, because of a mineral deficiency in the mother, would tend to impair the calcification of the fetal bones, producing a condition like fetal rickets in osteomalacia.¹⁰ On the other hand, should the fetus be capable of diverting the maternal mineral stream from the path of excretion characteristic of hyperparathyroidism, the increased availability of bone-forming minerals might lead to excessive calcification of the developing bones. It is



Fig. 1.—Cystic area in head of right humerus.

interesting that premature calcification of bone nuclei was detected in a 5 months old infant whose mother was found to be suffering from symptomless chronic hyperparathyroidism.²² Moreover, hypercalcemia was noted in the mother of an infant with osteopetrosis (marble bones),⁴¹ while osteosclerosis has been observed in fetuses whose mothers received excessive amounts of calcium, phosphorus and vitamin D during gestation.⁴² Whether abnormal activity of the maternal parathyroids is capable of affecting the fetus directly is unsettled. Some evidence suggests that the placenta is impermeable to parathyroid extract and that the fetus possesses considerable tolerance to a few large doses of this substance.⁴³ However, the occurrence of refractory infantile tetany in the case of Friderichsen suggested an inhibitory influence of excessive maternal parathyroid secretion on the functional development of the fetal parathyroid apparatus.²³ This possibility is compatible with the finding that newborn infants not infrequently show signs of parathyroid deficiency.⁴⁴ The production of bone disease in young animals by repeated injections of parathyroid extract shows that age alone offers slight protection against the pathologic effects of an excess of this substance in susceptible species.⁴⁵

In our case the failure to detect changes in the fourteen weeks fetus is inconclusive owing to the small fetal mineral requirements at this age and to the short period

of contact with the abnormal endocrine stimulus. The successful termination of pregnancy in the case of Bevere and Sorrentino² is a remarkable demonstration of parasitic embryonic growth and lends support to the idea that the placenta is impermeable to parathyroid extract. However, the outcome of the previous preg-

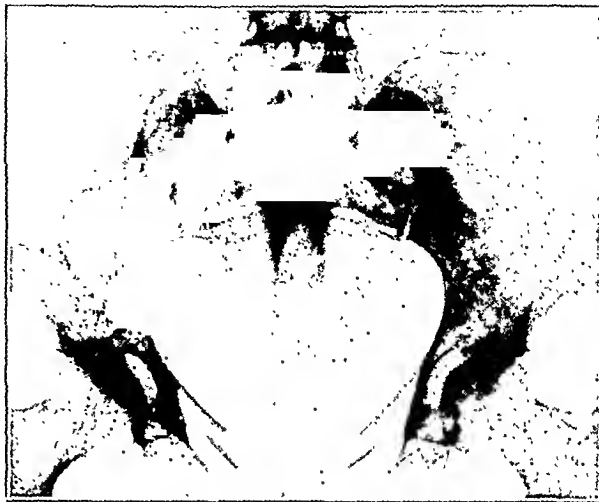


Fig. 2.—Appearance of pelvis, showing large cysts, decalcification and exaggeration of trabecular structure.

nancy, as well as the occurrence of fetal death in two of the cases previously cited, in which pregnancy and unrecognized hyperparathyroidism seem to have coexisted, is perhaps indicative of a significant infant mortality.

SUMMARY

In a case of chronic hyperparathyroidism complicated by pregnancy, the pregnancy was terminated because



Fig. 3.—Lateral view of skull, showing mottled appearance of bones with thickening of calvarium.

it was felt that these states would affect one another adversely with unfavorable results for mother and fetus. In view of the evidence for increased parathyroid function during pregnancy, the possibility is suggested that pregnancy may precipitate or aggravate hyperparathyroidism in some cases, thus accounting for the increased incidence of the disease in the female.

Fifth Avenue and One Hundredth Street.

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BRONCHIOGENIC CARCINOMA

A DIAGNOSTIC ENIGMA

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The recent voluminous literature on bronchiogenic carcinoma calls for justification in the presentation of a small group of cases. It may be said, however, that the capacity for early recognition of this disease has not kept pace with the increasing realization of its importance as a common condition. The trend of opinion about pathologic entities, in the present scheme of things, is a curious mixture of diverging views, few of which are not empirical. The importance of certain phases of problems depends on the frequency of reiteration from authoritative sources. It is unfortunate that we do not live in a medical utopia where some central registering agency, demanding uniformity of data, could have available the totality of facts on proved cases of any one condition. Things being as they are, however, we wish to emphasize the pathologic, clinical and roentgenologic nonconformity of bronchiogenic carcinoma, and we base our paper on twenty-three cases. The role this form of malignant process plays in simulating other conditions, its role as an imitator, is perhaps its most characteristic feature. Like the devil, it can appear in any shape or form.

INCIDENCE

The early history is traced to Morgagni (1761), whom Adler¹ recognized as the first to identify primary cancer of the lung. Barron² stated that Boyle (1810) described phthisis cancreuse as one of his six varieties of phthisis. Adler,¹ who in 1912 compiled 374 cases, was probably the first to dispel the belief in the rarity of primary carcinoma of the lung.

Graham,³ Edwards,⁴ Christie⁵ and Jaffé⁶ placed the incidence of bronchiogenic carcinoma somewhere between 5 and 10 per cent in relation to all carcinoma. At the University of Toronto for the ten year period ended 1936 the lungs and bronchi proved the third commonest site for malignant epithelial tumors as seen at autopsy.⁷

Whether the increased incidence is apparent or real remains unsettled. Klotz⁷ stated that the strongest argument for belief in a real increase is to be found in reports coming from institutions which have been under the same supervision and have required the same standards of diagnosis for a number of years and that "an increase under such conditions has been reported by Rosahn, Weller, Barron, Klotz, Simpson, Duguid, Hunt, and many others, and forms in part their belief

in the reality of the increase." More recently Olson,⁸ Matz⁹ and Barnard¹⁰ supported the belief in the absolute increase in incidence. According to the statistical data at the Institute of Pathologic Anatomy,¹¹ a real increase in the frequency of cancer of the lung has been determined. Fried,¹² on the other hand, took the opposite view and subscribed to the belief that the increase is apparent rather than real, citing among other reasons increased availability of hospitalization and revolutionary improvement in diagnostic methods as applied to the chest, enabling clinician and pathologist to discover lesions which had been overlooked before.

Klotz⁷ mentioned that the dictum of Virchow with reference to the rarity of primary tumors in organs which are the site of metastasis may have been a traditional barrier to a diagnosis of carcinoma of the lung. He also mentioned the ability to recognize lesions once thought metastatic, sarcomatous or inflammatory.

ETIOLOGY

The etiologic factors in bronchiogenic carcinoma, as in carcinoma elsewhere, remain obscure. Chronic inflammatory processes, inhalation of irritating substances and hereditary susceptibility are all invoked because of their possible contributory importance. Fried¹³ cited thirteen cases in which, according to autopsy, there was coexistent tuberculosis. The tuberculosis was of a healing fibrotic type in all instances. Fried denied any causal relationship between the two conditions. Bronchiectasis, as a common inflammatory condition, can be considered more important as a resultant process than as a causative one. Thus Tuttle and Womack¹⁴ among seventy-six patients with bronchiectasis treated in the chest service at Barnes Hospital saw only one who subsequently had bronchiogenic carcinoma.

Olson⁸ found only an 8 per cent incidence of primary carcinoma in the lower lobe of the right lung, yet bronchiectasis or abscess is very common there.

With respect to pneumoconiosis, Vorwald and Karr¹⁵ stated that if inhaled dust is of etiologic importance the incidence of pulmonary tumor in pneumoconiotic persons should be higher than in the general population and the dust in question should be irritating to the lung parenchyma and capable of producing carcinomatous proliferation of epithelial tissue. In a significant number of autopsies the incidence of carcinoma of the lung in silicotic persons was no higher than in nonsilicotic persons. These authors said that only recognized carcinogenic substances, radium or tar can be considered possible factors from an inhalation standpoint.

The frequent occurrence of carcinoma of the lung in the Schneeberg mining district has been a cause for much speculation. According to Frissel and Knox¹⁶ this frequency may be related to radioactivity of the inhaled dust. Schmorl, also cited by Klotz,⁷ stated that the arsenic content of the dust might be an additional

From the Department of Radiology, St. Luke's Hospital. The pathologic data are presented through the courtesy of Dr. Edwin F. Hirsch.

Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints.

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2. Barron, M.: Carcinoma of the Lung: Incidence, Pathology and Relative Importance, Arch. Surg. 4: 624-660 (May) 1922.

3. Graham, E. A.: Primary Carcinoma of Lung or Bronchus, Ann. Surg. 103: 1-12 (Jan.) 1936.

4. Edwards, A. T.: Tumors of Lung, Brit. J. Surg. 26: 166-192 (July) 1938.

5. Christie, A. C.: Diagnosis and Treatment of Primary Cancer of Lung, Brit. J. Radiol. 10: 141-158 (March) 1937.

6. Jaffé, R. H.: Primary Carcinoma of Lung: Review of 100 Autopsies, J. Lab. & Clin. Med. 20: 1227-1237 (Sept.) 1935.

7. Klotz, M. O.: Primary Carcinoma of Lung, Am. J. M. Sc. 196: 436-454, 1938.

8. Olson, K. B.: Primary Carcinoma of Lung: Pathologic Study, Am. J. Path. 11: 449-468 (May) 1935.

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10. Barnard, W. G.: Carcinoma of the Lung, Acta, Union internat. contre cancer 3: 213, 1938.

11. Wischen, W.: Zur Kenntnis des Lungenkrebses, Acta, Union internat. contre cancer 3: 221, 1938.

12. Fried, B. M.: Bronchiogenic Carcinoma: A Study of 152 Autopsied Cases, Acta, Union internat. contre cancer 3: 153-164, 1938.

13. Fried, B. M.: Bronchiogenic Cancer Combined with Tuberculosis of Lungs, Am. J. Cancer 23: 247 (Feb.) 1935.

14. Tuttle, W. M., and Womack, N. A.: Bronchiogenic Carcinoma: Classification in Relation to Treatment and Prognosis, J. Thoracic Surg. 4: 125-146 (Dec.) 1934.

15. Vorwald, A. J., and Karr, J. W.: Pneumoconiosis and Pulmonary Cancer, Am. J. Path. 14: 49, 1938.

16. Frissel, L. F., and Knox, L. C.: Primary Carcinoma of Lung, Am. J. Cancer 30: 219-288, 1937.

factor. It is said that the incidence of carcinoma of the lung is decreasing at Schneeberg since the introduction of respirators, which suggests that the factors responsible for the pneumoconiosis are also related to the production of neoplasia. On the other hand, respirators have been used at Joachimstal and the incidence of tumors remains high, with pneumoconiosis uncommon. Silicosis is common elsewhere, but the related incidence of carcinoma is nowhere as great as in this mining district. Teleky¹⁷ stated that "practically, anthracosis and silicosis have no influence on the appearance of lung cancer."

It is worthy of note that according to Alwens and Jonas¹⁸ chronic pulmonary cancer has been included by the German government in its list of professional sicknesses retributable by obligatory indemnity. This disease presents a typical latent period following the occupation as chrome workers. Chrome dust induces inflammatory changes in the respiratory tract. The possible etiologic importance of chrome dust as an etiologic factor is verified by J. Lowy.¹⁹

From the experimental aspect Vorwald and Karr failed to observe any irritation, hyperplasia or tumor transformation of the epithelium lining the respiratory tract whether the dust was inert or whether it had caused fibrosis of pulmonary connective tissue. Seelig and Benignus²⁰ cited the work of Murphy and Sturm, who noted that in mice tarred in various areas of the skin primary tumors of the lung developed. These tumors were designated as a distinct type of epithelial tumor. Murphy and Sturm expressed the belief that tar painting has the constitutional effect of lowering the resistance of the animals and that local irritation grafted on the lowered resistance induces the formation of pulmonary tumor. The results were the same even if he painted area was excised. Andervont, cited by Seelig and Benignus,²⁰ secured the same results by injecting dibenzanthracene subcutaneously. This procedure evoked tumors in the lung earlier than at the time of injection. This worker accomplished local application of carcinogenic agents by covering silk threads with molten dibenzanthracene and passing them through mouths, some of the tumors being squamous cell tumors and some adenocarcinomas. Andervont expressed belief in genetic susceptibility because the incidence was higher in a group of animals that had a higher incidence of spontaneous cancer.

Seelig and Benignus²⁰ developed a method of direct application of tar to bronchial and alveolar surfaces without a high death rate. They first used soot swept from the stack of the power house furnace and then used tar free lamp black impregnated with a known quantity of established potent carcinogenic tar. The method was to substitute for the usual shavings used for bedding mice whatever variety of soot, lamp black or dust was to be tested. In six days soot particles were located in the small intrapulmonary bronchi. In five weeks the black particles were abundantly present in the smaller bronchi and alveoli and sparingly present in the interstitial tissue. The first group of experimental animals had four times as many tumors as did the groups of controls.

Schabad²¹ further showed that by introducing different carcinogenic chemical products (e. g. coal and tar) in different ways and in different places a considerable augmentation was noted in the quantity of primary tumors of the lung in mice. Schabad also established that the birth of these tumors had no connection with inflammatory manifestations. In a large number of cases such tumors can be produced by subcutaneous or intraperitoneal introduction of blastogenous substances, which completely excludes the necessity for penetration of the agent into the respiratory tract. Descendants of mice so treated have a special susceptibility for primary tumors of the lung. He concluded that experimentally the two principal theories of pathogenesis, inflammatory processes and aerogenous penetration of blastogenous substances, are not confirmed. Koelsch²² said that irritation due to inhalation of irritating substances is of no etiologic importance.

Hyde and Holmes²³ cited the work of Slye and her co-workers, who developed a strain of mice 100 per cent cancerous and also proved that cancer of the lung in mice is a recessive mendelian characteristic. The intrinsic factor of hereditary susceptibility to tumor formation in human beings is of far greater importance than the extrinsic or environmental factor, according to Klotz.⁷

PATHOLOGY

The primary growth is located more frequently on the right than on the left side, according to most statistical analyses,²⁴ although Fried¹² in a large series of autopsies found a negligible difference in distribution between the sides. The irregularities of growth render difficult satisfactory classification of gross lesions, and the macroscopic separation of tumors into different groups based on autopsy material is of questionable value.²⁵ Even at autopsy it often is impossible to relate the tumor to the bronchus of origin, chiefly because of the degenerative changes that often occur and because of the frequency with which secondary infection is superimposed on the neoplastic process. The widespread ramifications of the bronchial system throughout the lung permit an origin in any portion of the latter, but the site of predilection is the main bronchus or its larger branches. The hilar type of lesion is the most common.²⁶ The main bronchus and the bronchus to the lower lobe on each side are the favorite locations for the neoplasms, accounting for the site of origin in 85 per cent of the cases studied by Vinson.²⁴ Fried¹² expressed the opinion that the tumor always originates in the main stem of the bronchus or in some of its smaller branches.

Tumors other than the hilar type are variously designated, being called lobular by Geschickter and Denison²⁶ and nodular by Kerley.²⁷ The lobular type, described by Geschickter and Denison, arises at the periphery of the lung from the terminal ramifications of the bronchi. They stated that the hilar and lobular varieties are related to the primary embryonic and post-embryonic growth centers of the bronchial tree, the

17. Teleky, L.: *Der berufliche Lungenkrebs*, Acta, Union internat. contre cancer 3: 258, 1938.
18. Alwens, W., and Jonas, W.: *Der Chromat-Lungenkrebs*, Acta, Union internat. contre cancer 3: 103-114, 1938.
19. Lowy, J.: *Des Bronchiokrebs als Beruf Krankheit*, Acta, Union internat. contre cancer 3: 182, 1938.
20. Seelig, M. C., and Benignus, A. B.: *The Production of Experimental Cancer of the Lung in Mice*, Am. J. Cancer 33: 549, 1938.

21. Schabad, L. M.: *Quelques données expérimentales sur les tumeurs du poumon*, Acta, Union internat. contre cancer 3: 189-195, 1938.
22. Koelsch, F.: *Lungenkrebs und Beruf*, Acta, Union internat. contre cancer 3: 243, 1938.
23. Hyde, T. L., and Holmes, G. W.: *Roentgenological Aspects of Primary Tumors of Lung*, Am. J. Roentgenol. 18: 235-243 (Sept.) 1927.
24. Vinson, P. P.: *Primary Malignant Disease of Tracheobronchial Tree: Report of 140 Cases*, J. A. M. A. 107: 258-261 (July) 1936.
25. Fried, I.: *Klotz*.
26. Geschickter, C. F., and Denison, R.: *Primary Carcinoma of Lung*, Am. J. Cancer 22: 834-877 (Dec.) 1934. Frissel and Knox.
27. Kerley, P.: *Recent Advances in Radiology*, Philadelphia, P. Blakiston's Son & Co., 1936.

former being the locality for bronchial proliferation and the latter for proliferation of the lung buds, whose evolution continues until late childhood. The lobular type is mentioned as being infiltrative in character, and cases are cited in which the infiltration has a miliary distribution. The nodular form is seen as multiple foci of pinhead to bean size which have a tendency to coalesce, raising the question of multicentric origin, and is hard to differentiate from multiple metastasis from an obscure primary growth. It may also be seen as a single peripheral lesion. An additional rare diffuse form is sometimes spoken of.⁷ This form may simulate a pneumonic consolidation or an interstitial fibrosis.

Histologically squamous, adenocarcinomatous (with or without mucous secretion) and anaplastic varieties are recognized. Fried²⁸ emphasized the importance of the basal cell layer in the origin of bronchiogenic carcinoma. He showed that the basal cells have marked

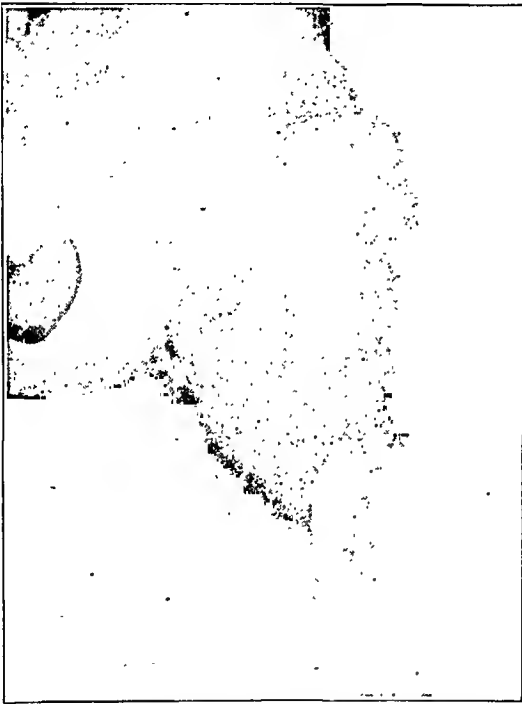


Fig. 1 (case 1).—Hip at time of admission. All symptoms referable to this lesion. Patient died in May 1936 and bronchiogenic carcinoma was found at autopsy.

potentialities for growth and are concerned with epithelial repair, being capable of differentiation into the specialized portions of the bronchial epithelium. Adler¹ in his case analysis stated that often it is difficult to distinguish the kind of epithelial cells that make up the tumor and its structural peculiarities: "One is frequently at a loss to decide whether in the section before him the cells are of epithelial or connective tissue origin, whether it is carcinoma or sarcoma." Adler stated also that the histogenesis was unsettled, being related to problems of epithelial metaplasia: "It is generally impossible to determine the histogenesis of a fully developed tumor." Even now, almost thirty years after Adler's observation, it is sometimes difficult to establish the histogenesis of bronchial neoplasms. It was his conviction that bronchial epithelium is a highly plastic material designed to accommodate itself in manifold ways to demands which local physiologic and pathologic conditions require. This view is sub-

scribed to by Tuttle and Womack,¹⁴ who expressed the opinion that hyperplastic and metaplastic lesions of the lung are protective rather than precancerous mechanisms. They stated that the ease with which bronchial epithelium becomes stratified and squamous explains the frequency with which this sort of epithelium is encountered in bronchiogenic carcinoma.

The importance of the basal cell layer in histogenesis, in accordance with Fried's theory, is affirmed by Edwards⁴ and Graham,³ and Klotz⁷ quoted Weller, who would depict graphically the histologic relationship between the different types of bronchiogenic carcinoma by a Y, the stem of which represents the anaplastic group. The two arms of the Y represent differentiation toward epidermoid or adenocarcinomatous types, the upper part of the arm indicating the highest degree of differentiation.

The squamous cell type of tumor is the most common,²⁹ but the classification of a tumor must be accepted with reservations, because different sections of the same tumor may present different microscopic features. A common cellular origin from epithelial basal cell deposits would predispose toward pleomorphism.³⁰ Thus in our series the tumor in one case was considered a sarcoma when tissue from a pleural portion was removed at thoracotomy. Later, on removal of the lung, the primary tumor was found to be a bronchiogenic carcinoma with extension to the pleural surface at the hilus.

The primary lesion spreads by way of the peribronchial lymphatics, and peripheral tumors often simulate metastatic or pleuritic growths. Pleuritic involvement may induce effusion into the pleural cavity. Extension to the regional and mediastinal lymph nodes is common, and mediastinal tumors may attain considerable size, not often, however, reaching the size of lymphoblastomas. Often the patient's initial consciousness of a pathologic process arises from a metastatic manifestation. Thus 12 per cent of Rogers'³¹ fifty patients who were examined post mortem went through the entire illness without a pulmonary symptom, and with 44 per cent a sign of metastasis was the initial symptom of illness. Arkin and Wagner³² in an analysis of 135 cases found predominant extrapulmonary signs and symptoms in one half.

The tendency of bronchiogenic carcinoma to cause widespread and early metastasis is well known. The situation of the lung in the circulatory system would favor generalized hematogenous dissemination.⁷ Tumor emboli from primary sources other than the lungs would tend to be filtered out in these organs and thus fail to reach remote foci. Central nervous system foci of metastasis, especially in the brain and adrenals, are a common observation. Adrenal involvement is said to cause a syndrome similar to Addison's disease. Extension to regional lymph nodes is most common, with the liver, abdominal lymph nodes, kidneys and bones other frequently observed sites. Rosedale and McKay³³ emphasized that metastatic bronchiogenic carcinoma is worthy of consideration in the case of any obscure intra-abdominal lesion.

29. Clerf, L. H., and Crawford, B. L.: Bronchiogenic Carcinoma, with Special Reference to Classification, Prognosis and Treatment, *J. Thoracic Surg.* **3**: 73-85 (Oct.) 1933. Frissel and Knox,¹⁶ Mattick and Burke,³⁰ Olson,⁵ Vinson.²¹

30. Mattick, W. L., and Burke, E. M.: Primary Bronchiogenic Carcinoma from Pathologic and Radiologic Points of View, *J. A. M. A.* **109**: 2121-2125 (Dec. 25) 1937.

31. Rogers, W. L.: Primary Cancer of Lung: Clinical and Pathological Survey of 50 Cases, *Arch. Int. Med.* **49**: 1058-1077 (June) 1932.

32. Arkin, A., and Wagner, D. H.: Primary Carcinoma of the Lung: A Diagnostic Study of 135 Cases in Four Years, *J. A. M. A.* **106**: 557-591 (Feb. 22) 1936.

33. Rosedale, R. S., and McKay, D. R.: A Study of 57 Cases of Bronchiogenic Carcinoma, *Am. J. Cancer* **26**: 493-506 (March) 1936.

28. Fried, B. M.: Primary Carcinoma of Lung: Bronchiogenic Carcinoma—Clinical and Pathologic Study, *Medicine* **10**: 373-508 (Dec.) 1931.

Secondary pathologic features related to bronchial obstructions are common; the tumor may obstruct the bronchus by intraluminal growth or by invasion of the wall, producing constriction. Pressure on the bronchus by a peribronchial tumor is an occasional process; ulceration may or may not occur. Obstruction causes defective drainage,³¹ with consequent infection. Chronic bronchiectatic, suppurative, pneumonic and pleuritic phenomena in any combination may thus ensue. Atelectasis may complicate the obstruction and perpetuate the infection.

PROGNOSIS

The prognosis in all cases is very poor, the patient who lives two years after coming under clinical observation being exceptional. The prognosis is modified by the predominant cell type of the tumor and by secondary infectious processes induced by bronchial obstruction.

SYMPTOMATOLOGY

In our series of twenty-three cases the diagnosis in every instance was established by microscopic examination, on the basis either of biopsy or of autopsy. In eleven instances the diagnosis was determined by autopsy, in six instances by bronchoscopic biopsy, in two instances by operation and in one instance by punch biopsy. In three cases the diagnosis was presumed on the histologic character of supraclavicular lymph node biopsy.

The duration of symptoms before the patient seeks medical aid is often striking, and Farrell³⁶ found that more than one half of fifty patients did not seek medical advice until the first symptoms had been present for a year or more. We agree with Vinson²⁴ that all chronic pulmonary diseases have similarity of symptoms. Bronchiogenic carcinoma may simulate any condition, and the protean nature of its symptoms is borne out by a review of our series.

The symptoms are modified of course by the location of the neoplasm and the mechanical changes it induces in the bronchopulmonary system and the neighboring structures. The average age was 51, and all but four patients were males. It is well to remember that these tumors occur at an earlier age than one generally associates with malignant growth. McRae³⁷ found 50 per cent of sixty-one patients not over 45, while Stein and Joslin³⁸ found 65 per cent of 164 patients between 40 and 60.

Hemoptysis can probably be considered the chief subjective sign, and when presented by a patient of middle age it carries diagnostic significance and merits the suspicion of a bronchiogenic carcinoma. In our twenty-three cases, hemoptysis occurred eight times, or in 34 per cent of the cases, at some time during the clinical course of the illness. As the presenting complaint, hemoptysis occurred only three times. Dyspnea occurred nine times, or in 38 per cent of the cases, and was the presenting complaint twice, the clinical picture in one case being confused by the coexistence of decompensated syphilitic heart disease. Pain in the chest proved severe in eight cases, in five of which it was the presenting complaint. Productive cough was present in nine cases and was the chief complaint in

three cases at the time of admission to the hospital. Hoarseness occurred five times. In one case the upper lobe of the left lung was implicated, as established at autopsy, and this easily accounted for the presence of hoarseness. In the other four cases the hoarseness was not so easily explained. Dysphagia is an unusual symptom and was present once, being attributable to displacement of the lower part of the esophagus by the tumor.

Three, or 13 per cent, of the patients had no symptoms referable to the respiratory tract and no physical signs referable to the pulmonary lesion at any time during their illness:

CASE 1.—*Femoral metastatic carcinoma from a bronchus simulating osteogenic sarcoma.* P. W. H., a Negro aged 35, admitted to the hospital complaining chiefly of pain in the left hip of two months' duration, had no respiratory symptoms. A large, firm, fixed mass in the region of the greater trochanter was found. X-ray examination (fig. 1) revealed a destructive lesion not unlike an osteogenic sarcoma. A chest film (fig. 2) indicated the presence of a nodular area in the right side of the chest which had the appearance of a metastasis. Death occurred in May 1936, approximately four months after the onset of the patient's illness.

At autopsy a primary bronchiogenic carcinoma of the lower lobe of the right lung was found. The bronchus to the upper portion of this lobe for a length of 3 cm. had a tumor surrounding it like the cap of a mushroom. The tumor measured 7 by 6 by 7 cm. The lumen of the involved bronchus was not occluded. There was a metastatic carcinoma involving the left femur and the submental, cervical, axillary, inguinal, iliac, peri-aortic and left femoral lymph nodes. There was a pathologic fracture of the left femur. Histologically the tumor was of an anaplastic type.



Fig. 2 (case 1).—Area at right hilus which was thought metastatic from lesion of hip.

In five cases, including the three reported, there were presenting complaints due to a remote metastatic manifestation of the disease. Three of these five patients sought medical aid because of pain in some portion of the spine, two because of cervical pain. One patient complained chiefly of pain in the hip on admission and another of pain in the groin.

A history of a complicating infectious process was present in nine cases.

ROENTGEN SIGNS

The roentgenographic data on the chest in our cases showed a high degree of variability, as might be expected from the unpredictable growth behavior of the neoplastic lesions. The inadequacy of gross classification establishes the futility of roentgen classification. The more patients we see the more we are inclined to agree with Peirce³⁹ concerning the inconstancy of roentgen pattern. Manges³¹ stated that "the disease has no single characteristic roentgen sign. It appears in various locations, sizes, shapes and densities, involves

34. Manges, W. F.: Primary Carcinoma of Lung, *Am. J. Roentgenol.* 27: 858 (June) 1932.

36. Farrell, J. T., Jr.: Diagnosis of Bronchial Carcinoma: Clinical and Roentgenologic Study of 50 Cases, *Radiology* 26: 261-269 (March) 1936.

37. McRae, T.: Bronchial Neoplasm: Clinical Features, *Arch. Otolaryng.* 12: 727 (Dec.) 1930.

38. Stein, J. J., and Joslin, H. L.: Carcinoma of the Bronchus, *Surg., Gynec. & Obst.* 66: 902, 1938.

39. Peirce, C. B., and Ingersoll, C. F.: Bronchiogenic Carcinoma, *Indust. Med.* 6: 411-422 (July) 1937.

small or large area; causes varying amounts of displacements of organs, different degrees of functional interference, at times out of all proportion to the size of the actual growth." Christie⁵ added that "elaborate classifications have added little to our ability to make a correct diagnosis."



Fig. 3 (case 2).—Destructive process involving cervical spine in November 1933. No pulmonary signs or symptoms during illness. Autopsy in December disclosed very small bronchiogenic carcinoma.

The direct roentgen sign, and probably the one most suggestive of primary carcinoma, is the presence of a fairly homogeneous shadow, well defined, usually at or near the hilus. This shadow, however, may send extensions into the lung field.⁴⁰ Thus in case 1 (fig. 2) the dense, well circumscribed hilar shadow produced no modification in the shadow of the portions of the lung

TABLE 1.—Presenting Complaints

1. Pain in skeletal system.....	5
2. Cervical portion of spine.....	2
3. Dorsolumbar portion of spine.....	1
4. Bony pelvis.....	1
5. Hip.....	1
6. Productive cough.....	3
7. Pain in chest.....	5
8. Hemoptysis.....	3
9. Dyspnea.....	2
10. Fever.....	1
11. Hoarseness.....	1
12. Dysphagia.....	1

(Two patients admitted to hospital with diagnosis already established.)

peripheral to the lesion. In three other cases (15, fig. 5; 17, and 19, fig. 6) there were definite, circumscribed, oval or circular masses, one of which was separated from the hilus. In this connection it is interesting to note the hilar shadow in the left lung in a case in which the shadow was due to metastasis to regional lymph nodes from a primary lesion of the opposite lung.

The indirect roentgenographic signs are dependent on the modification in the shadow of the portions of lung peripheral to the site of the lesion. Thus there may be produced emphysematous or atelectatic phenomena consequent on partial bronchial obstruction or

obstruction. We have no cases illustrative of partial obstruction or obstructive emphysema, though such a mechanism has been described in connection with bronchiogenic carcinoma. Such cases have been recorded.⁴¹

In the event of obstructive emphysema, air finds ready entrance to the lung but difficult exit. Films taken during inspiration may show no abnormality; films taken during expiration show a definite mediastinal shift away from the side of the lesion.

TABLE 2.—All Symptoms Elicited at Some Time During Illness

1. Loss of weight.....	9
2. Hemoptysis.....	8
3. Dyspnea.....	9
4. Skeletal pain.....	6
5. Productive cough.....	9
6. Chest pain.....	8
7. Hoarseness.....	5
8. Dysphagia.....	1

A more common complication is the production of collapse of the lung or a part of the lung by complete obstruction by the tumor of the lumen of the bronchus supplying that portion of the lung. The mechanism of bronchial obstruction depends either on intraluminal growth of the tumor or on mural growth with constriction of the bronchus.⁴² In either instance the reduction



Fig. 4 (case 3).—Sagittal section of right lung obtained at autopsy.

in the size of the air passage may be accentuated by edema and thus may vary from day to day. The observations at autopsy may be misleading in that they show apparent patency of a bronchus, although films taken before death indicated probably complete obstruction.

⁴⁰ Carman, R. D.: Primary Cancer of Lung from Roentgenologic Viewpoint, *M. Clin. North America* 5: 307 (Sept.) 1921. Manges.⁴¹

⁴¹ Manges, W. F.: Bronchial Neoplasms: Roentgenologic Aspects, *Arch. Otolaryng.* 12: 732-738 (Dec.) 1930.
⁴² Hirsch, I. S.: Roentgen Diagnosis of Malignant Neoplasms of Lung, *Radiology* 9: 470-496 (Dec.) 1927. Christie.²

In one instance the primary tumor involved the bronchus to the upper lobe of the left lung, yet there was a marked compression atelectasis of the lower lobe, accompanied by bronchiectasis. Here the tumor involving the bronchus to the upper lobe had apparently produced external compression of the bronchus to the lower lobe. The atelectatic process is of slow development when compared to the atelectasis of foreign body origin.⁴³ Thus in one case two films taken six weeks apart showed the slow progress of an atelectatic process. Kerley²⁷ expressed the opinion that deaeration of the lung begins in the least expansile portions, that is, at the apex or in the periphery just below the clavicle, especially with involvement of a bronchus to an upper lobe. He also said that mediastinal shift is greater with lesions of a lower lobe than with lesions of an upper lobe. In one case, mediastinal shift due to an obstructing mass in the left main bronchus was demonstrated. The homogeneous opacity is partly due to pleural fluid. In addition there was narrowing of the esophagus, an uncommon observation.

Complete or partial collapse of the lung creates a favorable nidus for infection, probably on the basis of defective drainage, an infectious process furnishing the background for frequent complications. Thus the massive obstructive pneumonia involving the lower and middle lobes of the right lung and the empyema account for one picture observed. Also the breakdown of tissue at the site of the lesion in the upper lobe of the right lung produced a picture which simulated a pulmonary abscess. The upper lobe of the left lung in one case was occupied by a bronchiectatic and suppurative pneumonic process. Pleural fluid may be the result of extension of parenchymal infection of the lung or may perhaps be the result of pleural metastasis.

For clarification of the nature of the roentgen signs of fluid, tumor masses or obstructive phenomena in cases in which there is a possibility of bronchiogenic carcinoma, the usual examination of the chest should be supplemented by lateral and oblique views. In the presence of a large, homogeneous shadow occupying the greater portion of a lung field, a "hard" film may localize a definite tumor mass or be of definite value in establishing the site of pathologic change. Films taken after thoracentesis are to be recommended. Roentgenoscopic examination is an important phase of the examination, and bronchograms are useful. The value of films taken during different phases of respiration has been mentioned.

An additional change occasionally observed is the presence of an infiltration process extending outward into the lung field. This was well illustrated in one case in which the diffuse infiltration was due to pulmonary lymphatic dissemination from a relatively small primary tumor involving the right main bronchus.

In recapitulation, we had direct evidence of a tumor in only six cases. In thirteen cases the presence of tumor could be inferred only from evidence of secondary pathologic processes. In four cases the roentgen evidence of tumor was vague or lacking entirely.

The roentgenologist occupies a pivotal position in the elucidation of positive signs referable to the chest and, working in close cooperation with the bronchoscopist, can render the early diagnosis of bronchiogenic carcinoma more of a certainty when the internist's evaluation of the history suggests the possibility of such a lesion. Bronchoscopic examination should be done

in all cases of obscure involvement with evidence of bronchopulmonary pathologic change.⁴⁴

From the standpoint of differential diagnosis the following points are offered, though we recognize the definite limitations in their usefulness: Tumors of the lymphoblastoma group are apt to produce more embarrassment of mediastinal structures; their shadows are usually larger, they are nodular and often bilateral and they are much more radiosensitive, a differential point in diagnosis of great value.³⁴ Dermoid tumors are always connected with the anterior mediastinum, often cast a homogeneous, rounded, well encapsulated shadow and may show calcification.⁴⁵ Osteoma of a rib or osteochondroma of the sternum can be identified with their places of origin by careful roentgen study in different projections. Neurofibroma occasionally produces a dense shadow in the lung field, but changes in the dorsal vertebrae can usually be determined if proper films are taken. Neurofibroma is probably the commonest tumor of the posterior mediastinum. Paravertebral shadows and cardiovascular lesions are unlikely to be confused with bronchiogenic lesions. The usual discrete nodular character, multiplicity and frequent bilaterality of pulmonary metastatic foci are distinguishing features. However, pulmonary metastas-

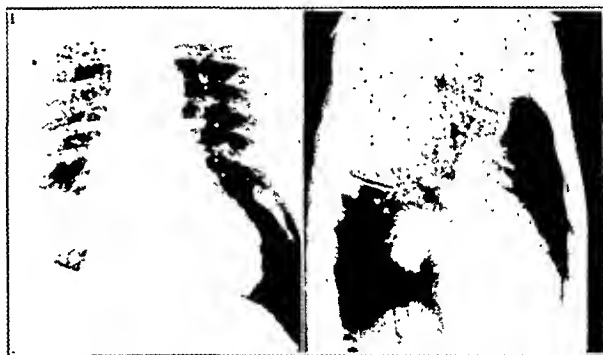


Fig. 5 (G. C.).—Chest in two views showing tumor of right lower lobe. Patient died in June 1938, several days after lower and middle lobes were removed.

sis may be massive and infiltrative⁴⁵ and primary carcinoma may have a miliary distribution, and differentiation at times is impossible.

With distinguishing pulmonary lesions due to foreign body the history is of great importance.⁴¹

Inflammatory conditions of an acute nature may initiate the clinical picture of a bronchiogenic neoplasm, and only when convalescence is unduly prolonged does a primary malignant process become suspected. Chronic inflammatory processes are, in the majority of instances, bilateral. An exception is noted in the case of foreign body. In this regard it is rare indeed when the history will not establish the diagnosis of foreign body.

Tuberculous lesions of sufficient size to offer diagnostic difficulties evolve in one direction or the other in a relatively short period of observation. The hilar region, a common location for tumor, is a rare site for adult tuberculosis, and even more rare would be hilar tuberculosis without a parenchymal lesion.

SUMMARY

The pathologic, clinical and roentgen features of twenty-three proved cases of bronchiogenic carcinoma emphasize the protean manifestations of this disease.

43. Golden, R.: Effect of Bronchostenosis upon Roentgen Ray Shadows in Carcinoma of Bronchus, *Am. J. Roentgenol.* 13: 21-30 (Jan.) 1925.

44. Holinger, Paul: The Diagnosis of Bronchiogenic Carcinoma—Bronchoscopic Aspects, *Illinois M. J.* 72: 431-434 (Nov.) 1937.
45. Farrell, J. T., Jr.: Roentgen Diagnosis of Intrathoracic Neoplasms *Radiology* 13: 1-16 (July) 1929.

In conclusion we quote an important and pertinent statement made by Dr. G. W. Scupham, of Chicago: "Whenever pulmonary symptoms, particularly dyspnea and pain, are out of proportion in their severity to x-ray or physical findings, bronchiogenic carcinoma is likely."

ABSTRACT OF DISCUSSION

DR. LEROY SANTE, St. Louis: All will agree with the authors about the inconsistencies of the x-ray appearances in bronchogenic carcinoma in the chest. Their wide variety is notorious and it is a challenge to see whether we cannot bring some order out of chaos. If we bear in mind the two fundamental types of involvement described by Ewing, it will at least afford a basis on which to formulate the diagnosis. The nodular type of carcinoma that tends to remain local springs from the superficial layers, grows as a nodule and by occlusion leads to atelectasis. The second type springs from the deeper bronchial layers, has a tendency to metastasize, has a tendency to break down in the center forming abscesses, and simulates a pyogenic abscess so closely that one cannot tell them apart, even at autopsy. If these facts are borne in mind and the x-ray observations are correlated with the clinical symptoms, we shall have a better opportunity of arriving at a correct conclusion. One is dependent here more on correlation with the clinical history than in any other condition in the chest. The relatively long duration of carcinomatous conditions without febrile reaction is a point to which a great deal of weight should be given. If, in addition, there is bloody expectoration, this is additional evidence of carcinoma. If one has the opportunity of examining a patient over a considerable period of time and can see an increase in the size of the lesion, it becomes evident that one is dealing with a new growth. With massive lesions in the chest especially when there is a febrile reaction the difficulties begin and sometimes it is almost impossible to determine the true nature of the condition. If massive atelectasis suddenly develops without any other evident cause, it is a manifestation of the nodular type of carcinoma, which occludes the bronchus. Occasionally lesions develop on the pleural surface, giving rise to pleural effusion. Aspiration of some of the fluid, allowing a little air to get in, will permit one to see the character of the lesion on the surface. Massive involvement may present difficulties. A lateral view may show such enormous masses extending from the posterior wall of the chest. Such a condition may, in the presence of a febrile reaction, give one the impression of a localized effusion. Still other cases occur in which localized pleural effusions give the appearance of rounded nodules in the region of the interlobar space, resembling tumor. In subsequent examinations in a few weeks these may show increase in size from accumulation of fluid which could easily be mistaken for carcinoma.

DR. ROSS GOLDEN, New York: By analysis of a series of cases like this made by Drs. Jenkinson and Hunter, our knowledge of the x-ray manifestations of these processes is improved. A point worthy of emphasis is the importance of the physical situation of the growth in the x-ray appearances and in the clinical evidence of the disease. The growths which arise out in the periphery manifest themselves differently both on the x-ray films and clinically from those in the larger bronchi. The growths that arise in the larger bronchi cause earlier and more serious disturbance in the pulmonary function and the symptoms are likely to be based on that disturbance for a while. Another point to emphasize is the value of injecting iodized oil through the glottis. It does not have to be done by bronchoscope but can be done through the glottis. Very important information may be thus obtained. The importance of bronchoscopy itself in the diagnosis of carcinoma of the bronchus must not be forgotten.

DR. R. G. TAYLOR, Los Angeles: There is one thing in connection with the diagnosis of these cases that has not been mentioned; probably it has only been overlooked. That is, in these dense areas in which the ordinary film gives no detail, an overexposed film or one made on the Bucky diaphragm gives more detail in the dense lung areas. It is worth trying and frequently one gets additional information.

DR. EDWARD L. JENKINSON, Chicago: We did not show slides or films for one specific reason. Dr. Hunter and I have been working on this paper for about two years, and we have gone over numerous films with the idea of picking x-ray appearances which might be characteristic of primary lung neoplasms. From our experience we have been unable to determine anything characteristic of neoplasms from the x-ray appearances. The shadows were usually bizarre and might well be due to various other diseases. From our experience we believe that bronchiogenic carcinoma is still a diagnostic enigma. We concur in what Dr. Sante said with regard to serial films. They are an aid, along with clinical observations, in at least arousing one's suspicions that a malignant condition exists. Two of our patients showed only small infiltrating lesions along the left upper lobe bronchus. The patients were in an excellent state of health and complained only of a slight pain in the upper left chest. From the x-ray appearances it was impossible to differentiate these lesions from many other lesions which might occur in the upper lobe. Dr. Chevalier Jackson examined one of these patients with the bronchoscope, but as the lesion was in the left upper bronchus it was impossible to get a specimen. The injection of iodized oil revealed a blocking of the left upper lobe bronchus. When the patient was irradiated the upper lobe lesion completely disappeared. Later on Dr. Jackson found a squamous cell carcinoma, proved at biopsy, in the left main bronchus. We agree with Dr. Taylor that overexposed Bucky diaphragm films will often be of aid in recognizing neoplasms in the lungs. The planograph, we believe, is of greater value than the dark film. Fever was present in many of our reported cases.

RECONSTRUCTIVE AND STABILIZING SURGERY

FOR RESIDUAL SUPPURATIVE ARTHRITIS OF
HIP JOINT: A STUDY OF FORTY-SIX
UNSELECTED CASES

HALFORD HALLOCK, M.D.
NEW YORK

Between the years 1919 and 1937, thirty-eight patients had forty-six operations at the New York Orthopaedic Dispensary and Hospital for the reconstruction or stabilization of a hip joint that had been damaged or destroyed by previous suppurative arthritis. The experience with these cases and the results that have been obtained are now reported. After a careful review of the histories and roentgenograms, it is felt that all these persons had actually had suppurative arthritis.

The operations consisted of twenty reconstructions, four arthroplasties, seven shelf stabilizations and fifteen fusions, and they will be discussed in this order. There were no operative deaths. One patient, a child, died six years later from spinal meningitis.

THE RECONSTRUCTIONS

Reconstructions numbered twenty and were performed on eighteen patients, who varied in age from 1½ to 17 years and averaged 9. Two each had a second reconstruction on the same hip one year later. The average time of operation after the initial infection was six years, varying from fourteen months to sixteen and one-half years.

The amount of joint damage was staggering. Extensive destruction of the femoral head and neck was the rule, and 70 per cent of the hips were dis-

From the New York Orthopaedic Dispensary and Hospital.
Read before the Section on Orthopedic Surgery at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 13, 1939.

located. The type of original infection is not known except in three cases, in two of which it was due to a staphylococcus and in one to a pneumococcus. There were no draining sinuses at operation. Drainage occurred postoperatively in two cases, or 10 per cent. At follow-up examination all patients were free from sinuses.

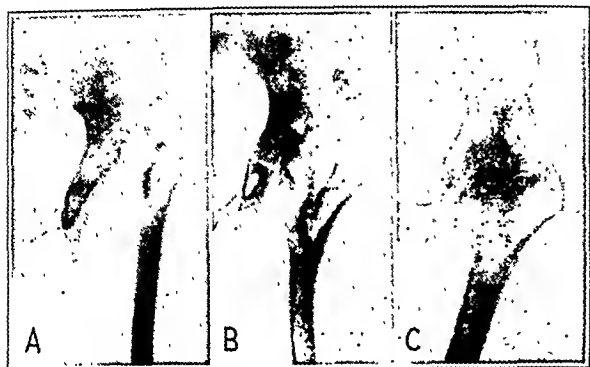


Fig. 1.—Reconstruction in S. B., a girl of 9 years; bifurcation procedure. A, before operation; B, eight months after operation; C, eight years after operation. Result: no pain, flexion mobility 40 degrees, index 23, dislocation cured, shortening 1 inch and moderate limp. The patient dances, skates and can walk thirty-eight blocks.

The type of reconstructive procedure varied chiefly in relation to the extent of joint damage. In general, if sufficient length remained, the neck was shaped and placed in the acetabulum and the trochanter was usually transplanted downward (five cases). If the neck had been completely destroyed, the end of the femur was bifurcated, the outer or trochanteric portion wedged outward and the medial portion reduced into the acetabulum (eight cases). In four cases the trochanter or abductor attachment alone was moved downward, and the end of the shaft was placed in the acetabulum. In one case with bony ankylosis, a supporting ledge or

TABLE 1.—Example: Index of Function of Normal Hip

Arc of Motion	Degrees of Motion	Factor	Product
Flexion.....	145	0.4	58
Extension.....	10	0.1	1
Abduction.....	45	0.4	18
Adduction.....	30	0.2	6
	20	0.2	6
	60	0.1	6
Index of function.....			95

shelf of bone was fashioned beneath which the liberated end of the femur was placed. Bony ankylosis recurred. In another case with marked overproduction of bone a naturally formed ledge was utilized as a shelf, and the reshaped upper end of the femur was placed in a notch beneath it. This patient when last seen, a year later, had 70 degrees of painless anteroposterior mobility and a stable hip. A Colonna procedure was employed in one case but failed, primarily because of insufficient acetabular depth. The acetabulum was made deeper in half the cases exposing bone in two and probably in five. An entirely new acetabulum was constructed in one. In two cases a shelf was also turned down from the ilium over an insufficient and oblique socket.

All patients were placed in plaster spicas after operation, and motion was begun in from one and one-half to twenty-eight weeks with an average of twelve. The records do not state why immobilization was continued

for so long, but the most probable reason was the high percentage of preoperative dislocation and attendant instability.

Physical therapy was given in the forms of massage and exercise and was continued as long as the patient was in the hospital and as long as he would return to the clinic.

Results.—Follow-up examinations were made on all the patients from one to fifteen years after operation with an average of six years; expressed as case years, the average time was eleven.

Pain: Three patients had pain before operation and five, or 28 per cent, after. The low incidence of preoperative pain was probably due to the youth of the patients (average 9 years) and to the high proportion of dislocation (70 per cent). The relatively low percentage of postoperative pain, 28, is gratifying; but

TABLE 2.—Index of Function of Hip Expressed in General Terms

	Index
Hypermobile.....	Over 110
Normal.....	90-110
Good.....	60-90

only four of the patients have reached adult age. These four, now ranging in age from 20 to 28 years, are without pain, but two have had a recurrence of bony ankylosis, one a thin joint space with irregular articulating femoral surface and practically absent motion (index 2, described in the next section), and another a smooth stump of femoral neck articulating with a small residual socket and presenting an index of 28. It is probable that when the rest of these patients have been followed into adult life a higher percentage of pain will be found.

Motion: In order to express simply and completely the range of mobility in any given hip joint, the index of function was used that was described by Ferguson and Howorth.¹ To obtain this index, the degrees of

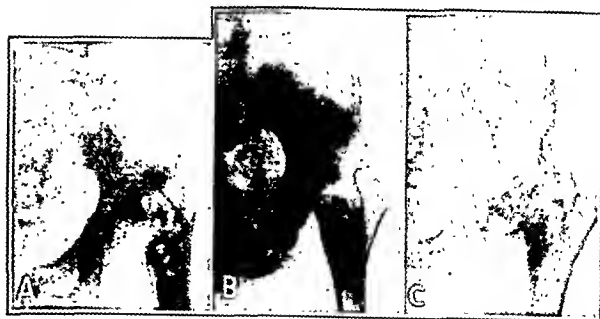


Fig. 2.—Reconstruction in W. Y., a boy of 13 years; bifurcation procedure. A, before operation; B, eight months after operation; C, thirteen years after operation. Result: no pain, index 2, shortening 1½ inches and moderate limp. The boy plays baseball and basketball and can walk 5 miles.

motion present in each arc of mobility are multiplied by a suitable factor the size of which depends on the relative importance of that particular arc for function of the hip as a whole. The products are added, and the sum is the index of function. The normal hip has an index of from 90 to 110. Table 1 is an illustration.

1. Ferguson, A. B., and Howorth, M. B.: Slipping of Upper Femoral Epiphysis, J. A. M. A. 97: 1867 (Dec. 19) 1931.

Before operation 70 per cent of the hips dislocated, and the index of function varied from 0 to 110 and averaged 64. After operation 20 per cent dislocated, and the index ranged from 0 to 69, averaging 20. Three operations resulted in bony ankylosis. The results are presented in table 3.

Dislocation: This complication was present preoperatively in fourteen cases, or 70 per cent, and was

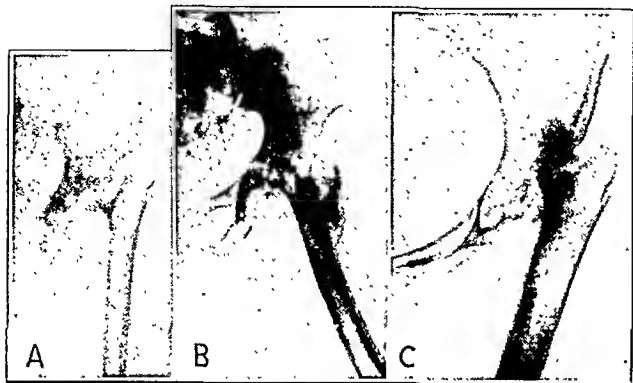


Fig. 3.—Reconstruction in C. M., a girl of 8 years; bifurcation procedure. A, before operation; an unsuccessful reconstruction was performed on this hip one year previously; B, three months after operation; C, thirteen years after operation. Result: no pain, occasional stiffness, flexion mobility 35 degrees, index 23 and shortening 2 inches. The patient works in an office, dances and walks sixteen blocks a day in the city and a great deal in the country on week ends.

relieved by operation in all but five. Postoperative roentgenograms showed that in four cases the displacement was present immediately after operation. Manipulations were done in three cases, unsuccessfully in two and successfully in one but followed later by redislocation. The fourth hip joint was considered to be stable enough, although subluxated, and was not manipulated; but dislocation occurred subsequently. The fifth joint, treated by a Colonna reconstruction, dislocated after eight weeks when taken out of plaster because of insufficient acetabular depth.

Shortening: The average amount was $1\frac{1}{2}$ inches (3.8 cm.) before operation and the same after. It varied from one-fourth inch (0.6 cm.) of lengthening in one case, due to osteomyelitis and shortening of the opposite tibia, to 3 inches (7.6 cm.).

Limp: Preoperatively, every patient had a limp; and at follow-up examination, except for one instance in which a specific statement was not made, a limp was present in each case. The limp was not usually described before operation; but after, it was noted as severe in six cases, moderate in six, slight in three and merely present in four. In all the six cases in which there were marked limps, mobility was absent or greatly restricted, and there were also present one or more of the following factors: pain, dislocation, shortening of 1 inch (2.5 cm.) or more and pronounced flexion or adduction deformity (over 35 degrees of the former and 15 degrees or more of the latter).

Subsequent Operations: Nine subsequent operations were performed on eight patients. These included one open release of hip flexion deformity, one arthroplasty, one shelf stabilization and four fusions, all performed on previously reconstructed hips, one supracondylar osteotomy for external rotation deformity and one for anteversion of the femoral neck.

THE ARTHROPLASTIES

In four cases conditions were such as to make possible the fashioning of a more or less characteristic articulation with the employment of interposed tissue.

These procedures have been designated as arthroplasties in contradistinction to the reconstructions that have just been discussed.

The ages of the patients varied from 14 to 17 years, and the average time of operation after the original infection was six years. The organisms responsible for the joint damage are not known, but in one case *Staphylococcus aureus* was cultured from the bone at operation. Two of the patients presented a bilateral bony ankylosis and one a fibrous ankylosis on one side (index 6) and a bony ankylosis on the other. They were extremely handicapped. The fourth had a unilateral fibrous ankylosis with a functional index of 5. There were no dislocations.

In the cases of bony ankylosis, new heads and sockets were constructed out of solid bone; in the two with fibrous ankylosis, both femoral heads were made much smaller, and in one the acetabulum was made deeper.

The tissue that was interposed consisted of a double layer of fascia lata in one case, a single layer in two cases and a thick peduncular flap of fibrous tissue in another case.

None of the patients had sinuses at the time of operation. Preoperatively, they had been present in two but had closed three and six years before. In the other two, it is not recorded whether sinuses had ever been present or not. Three patients developed drainage after operation, after ten days, three months and seven months, respectively. It was in this first case that *Staphylococcus aureus* was cultured at operation, although all sinuses had been closed for three years.

At follow-up examination, all patients were without sinuses.

Plaster was applied after operation and in addition skin traction was used twice. Motion was begun in from three to six weeks, the period averaging four weeks. Manipulations under anesthesia were given in one case to maintain motion, but subluxation resulted, and bony ankylosis recurred.

Results.—The average time of follow up examination was eight case years and varied from four to fifteen years.

Pain: Before operation, only one patient complained of pain, and after, also only one. The patient who

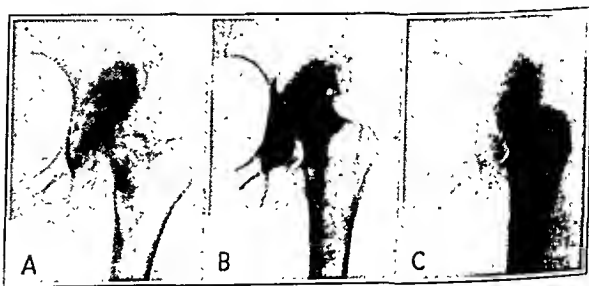


Fig. 4.—Arthroplasty in A. S., a girl of 14 years. About three fourths of the head was resected, and a single layer of fascia lata was interposed. *Staphylococcus aureus* was cultured from the bone at operation, and sinuses developed on the tenth day. A, before operation; B, one year after operation; C, three and one-half years after operation. Result: no pain, flexion mobility 20 degrees, index 4 and no sinuses.

previously had pain, a boy of 17 with a fibrous ankylosis of one hip and an index of 5, was entirely relieved; at present, fifteen years later, at the age of 32, he has 50 degrees of flexion mobility but limited lateral motion and rotation. The patient who since operation has had pain and who previously had a bony ankylosis of both hips now has a sensitive fibrous ankylosis with only 5 degrees of anteroposterior mobility.

Two patients have reached adult age and are free from pain. One, however, has a recurrent bony ankylosis, and the other, the man of 32, a movable hip with a fair range of flexion mobility.

Motion: Before operation, two patients presented bony ankylosis and two fibrous, both with indexes of 10. After operation, in the first two bony ankylosis



Fig. 5.—Arthroplasty in H. F., a boy of 17 years. The preoperative film has been discarded. The femoral head was considerably reduced in size and the acetabulum was made deeper. A single layer of fascia lata was interposed. Motion was begun at three weeks. A, two and one-half years after operation, and B, fifteen years after operation. Result: no pain, flexion mobility 50 degrees, index 26, shortening $1\frac{3}{4}$ inches and slight limp.

redeveloped and the other two obtained motion with indexes of 5 and 26.

Limp: All four patients limped preoperatively, three badly because of bilateral involvement and absence of motion. After operation, these three still limped severely because of recurrence of bony ankylosis in two and failure to develop any more than a slight amount of motion in the third. The one patient with unilateral involvement, the man now 32 years of age, walks extremely well and has only a slight limp. He has a

TABLE 3.—Functional Results of Reconstruction

Function	Index	No. of Cases
Normal.....	90-100	0
Good.....	60-90	3
Fair.....	30-60	0
Poor.....	1-30	13
No motion.....	0	1
		20

flexion and external rotation deformity of respectively 20 and 35 degrees, $1\frac{3}{4}$ inches (4.5 cm.) of shortening and excellent flexor, extensor and abductor hip muscles.

THE SHELF STABILIZATIONS

In seven cases, with dislocations in six and subluxation in one, shelves were constructed above the displaced femurs to achieve stability and preserve motion. In six the shelves were turned down from the ilium, and in one a section of iliac bone was turned outward and upward and the intervening space filled in with fragments of bone.

The patients varied in age from 2 to 19 years and averaged 10. The time of operation after the original infection also ranged from two to nineteen years, averaging nine. The disease began in one at the age of 3 weeks.

Two of the patients complained of pain, and all had a limp. The average amount of shortening was 1.7 inches (4.3 cm.). No sinuses were present at opera-

tion or at follow-up examination, and none developed postoperatively. The causative organisms are not known except in two cases, in both of which it was a pneumococcus.

Postoperative x-ray films demonstrated adequate shelves in five cases. In one the shelf was placed too high, but the femur in later years either grew or ascended to its level and finally came to rest securely beneath it. In another case the shelf was placed too obliquely. It was revised but two months later had become again too oblique. A second revision was performed, and the shelf was also moved down three-eighths inch (1 cm.); but subsequent x-ray studies revealed still too high and oblique a position. In six years the femur had either grown or ascended to the level of the shelf but would not remain beneath it except while traction was maintained on the leg. This patient was only $2\frac{1}{2}$ years old at the time of operation, and the shelf was turned down from the ilium. It is now our custom to postpone shelf stabilization if possible until the child is a few years older and the ilium is better developed, and to drive a free graft of iliac bone into the ilium immediately above the displaced femur to obtain accurate placement more readily.

Results.—Follow-up examination varied from one and one-half to twelve years after operation and averaged six case years.

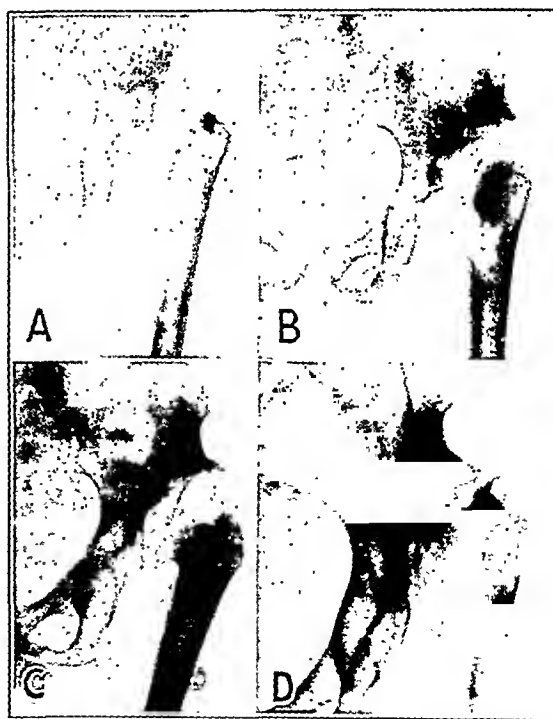


Fig. 6.—Shelf stabilization in M. S., a boy of 5 years. A large mass of bone was turned up and outward, and the resultant triangular space was filled with bone. Too high a position was obtained, but in later years the femur grew and ascended to the level of the shelf. A, before operation; B, five months after operation; C, one and one-half years after operation; D, nine years after operation. Result: slight pain only when roller skating, flexion mobility 75 degrees, index 46, abductor muscle power 70 per cent of normal and marked limp. The shelf offers oblique support. The patient works as a grocery clerk and is on his feet all day without any trouble.

Stability: X-ray observation at the time of follow-up examination revealed three adequate shelves, two instances of complete shelf absorption and two dislocations from beneath a shelf. In one of the latter, the shelf was ineffective because of too much obliquity. In the other, it appeared to be adequate, but beneath

it there was a laterally protruding ledge of bone that was apparently levering the femur out of place.

The shelves that underwent complete absorption had been turned down in two patients respectively 10 and 15 years of age. Postoperative x-ray films showed apparently well constructed shelves placed within one-fourth inch (0.6 cm.) or less of the end of the femur.

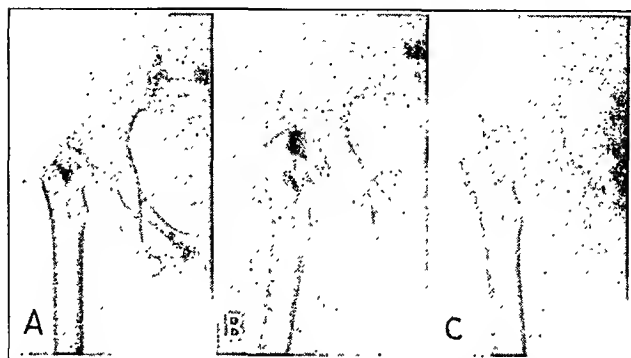


Fig. 7.—Shelf stabilization in F. S., a boy of 15 years. The femur was pulled down, and a shelf was turned down from the ilium. A, before operation; B, immediately after operation; C, seven years after operation. Result: frequent pain on beginning to walk, flexion mobility 115 degrees, index 66 and complete absorption of the shelf. The patient can walk several miles but had to give up delivering groceries because of pain.

Absorption was noted in one after three months and estimated at 60 per cent in the other after ten months. One shelf, placed too high in a boy of 5, underwent partial absorption, which fortunately was insufficient

TABLE 4.—Results of Reconstructive and Stabilizing Procedures

	Recon- struc- tions	Arthro- plasties	Shelf Stabili- zations	Fusions
Number.....	20	4	7	15
Average age, yr.....	9	15	10	18
Average time of follow-up examina- tion, ease yr.....	11	8	6	7
Pain before.....	3	1	2	10
Pain after.....	5	1	4	1
Average index before.....	64	5	75	19
Average index after.....	20	6	51	..
Dislocation before.....	14	0	7	5
Dislocation after.....	5	0	3 stable; 4 unstable	0
Limp at follow-up examination				
Severe.....	6	3 (bilat.)	3	2
Moderate.....	6	..	4	6
Slight.....	3	1	..	5
Present but not described.....	4	..	..	1
Not stated.....	1	..	..	1

to jeopardize the stability that was later obtained after upward growth or ascension of the femur.

Pain: Two patients complained of pain before operation and four after. Two of these had pain before stabilization and two had not. The pain at follow-up examination was moderate in one, frequently occurring on beginning to walk, slight in two when they were roller skating and playing too much football, and so severe in the fourth, a woman of 22, as to necessitate hip fusion three years later. The shelf in this case was quite adequate, but irregularity of articulating surfaces had developed between the femur, the shelf and the ilium. As for the three other patients, who had only slight or moderate pain, the shelf had completely absorbed in two but appeared to be adequate in one.

Motion: Before operation the functional indexes varied from 27 to 100 and averaged 75; at follow-up examination they ranged from 24 to 83, averaging 51.

Shortening: This varied from one-half inch (1.3 cm.) of lengthening in one case, due to accompanying involvement and dislocation of the opposite hip, to 2½ inches (6.3 cm.). The average amount of shortening was 2 inches (5 cm.); 1.7 inches (4.3 cm.) before operation.

Limp: Preoperatively a limp was noted as merely present in four cases, moderate in two and severe in one. At follow-up examination it was described as moderate in four and marked in three. Each of these three patients with a severe limp had 2 inches (5 cm.) or more of shortening, two had pain, and in one the shelf had completely absorbed. In addition, abductor muscle power was markedly weak in two and about 70 per cent of normal in one.

THE FUSIONS

Fifteen patients had hip fusion operations. All had unilateral lesions, and five had dislocations. Four patients had previously had reconstructions, and one had a shelf stabilization later. These procedures had all failed, because of pain in two cases, dislocation and pain in one and severe flexion deformity with fibrous ankylosis in another. The ages of these patients varied from 8 to 41 years and averaged 18. The time between the original infection and operation ranged from three to twenty-two years, averaging twelve.

In only two cases was the infecting organism known, and in both of these it was a pneumococcus. Material for cultures was taken at operation from half the patients, but a growth was not obtained in any instance.

A sinus of eight months' duration was present in one case at the time of operation. Fusion was proceeded with, however, because it was thought that the hip might be tuberculous, but only chronic nonspecific inflammation was found on microscopic examination of tissue specimens. Postoperative drainage occurred in three cases. This was probably caused in two by

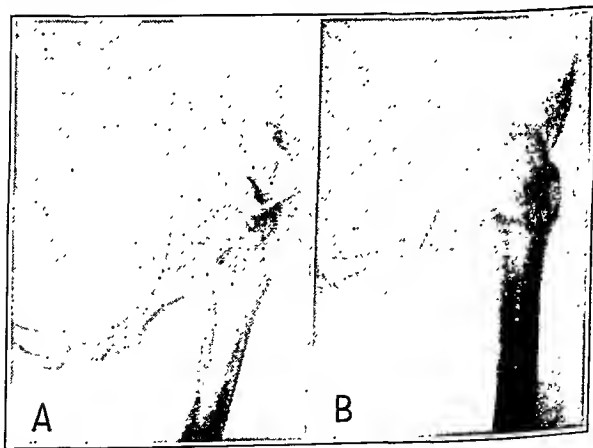


Fig. 8.—Fusion in H. A. V., a girl of 13 years. A, before operation; B, eleven years after operation. Result: no pain, solid arthrodesis in 45 degrees flexion, 10 degrees abduction and 10 degrees internal rotation, shortening 2 inches and moderate limp.

wound infection. None of the patients had sinuses at follow-up examination.

The presenting complaint was pain in ten cases and stiffness, weakness, severe deformity and marked limp in four others.

The type of fusion operation varied. In nine cases a Hibbs procedure was used in which the anterior two thirds of the greater trochanter and part of the shaft were removed, with or without an attached muscle pedicle, rotated 180 degrees and driven into the ilium

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over the bared neck or upper extremity of the femur. Bone chips were also placed about the transposed trochanteric mass, femur and ilium in a few instances. In three cases grafts from the ilium were employed, augmented twice with chips. In two cases fusion was made with suitably placed multiple small bone transplants. In two others direct contact was made between the end

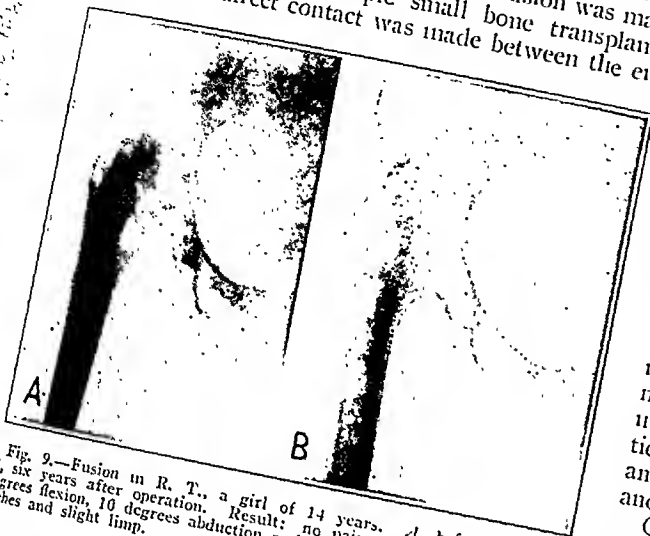


Fig. 9.—Fusion in R. T., a girl of 14 years. A, before operation; B, six years after operation. Result: no pain, solid arthrodesis in 40 degrees flexion, 10 degrees abduction and neutral rotation, shortening 1½ inches and slight limp.

of the femur and the acetabulum or ilium. Bone chips were also used in one of these and a steel nail for fixation in the other.

In half of the cases, cartilage and bone were removed from the inner or superior portions of the joint in order to secure intra-articular fusion as well as arthrodesis through the grafts. Any resulting space was usually filled in with bone chips.

In general, walking in plaster was permitted at three months; as soon as clinical and x-ray examinations indicated that the arthrodesis was secure enough, plaster support was discontinued. This took place on the average after six and one-half months.

In each of four cases a subtrochanteric osteotomy was subsequently performed in order to obtain proper position. This was necessary in three cases owing to the fact that in each arthrodesis was done in the presenting malposition, for this could not be changed without undue exposure and traumatism with consequent increased risk of reactivation of infection. In the fourth case, in which fusion had failed, osteotomy was performed to relieve a persistent backache due to excessive hip flexion deformity with accompanying exaggerated lumbar lordosis. Rearthrodesis was refused.

Two operations were necessary in one case, in which the most likely cause of postoperative drainage was a deep wound infection, as culture of the bone at operation yielded no organisms. A fusion was obtained, however, within six months, but sinuses persisted for four years.

Results.—The time of follow-up examination varied from one and one-half to thirteen years and averaged five or seven case years.

Attainment of Fusion: Eleven, or 73 per cent of the patients, obtained fusion by primary operation and four failed to do so. Later three of these had a secondary or refusion operation with success in two and failure in one. The fourth has refused further surgical treatment because the hip has remained painless. In all, thirteen, or 87 per cent, of the patients have fused joints and are symptomless at the present time.

Pain: Ten patients, or two thirds of the group, had pain before operation; at follow-up examination, only one. This is the case in which refusion failed and a third operation was advised.

Shortening: The average amount of shortening was 1.7 inches (4.3 cm.) before operation and 1.9 inches (4.8 cm.) after.

Limp: Preoperatively a limp was present in every case. It was severe in three cases, slight in one and present but not described in eleven. At follow-up examination two patients had a severe, six a moderate and five a slight limp. In one case it was merely noted as being present; and in another no statement was made. One of the patients with a severe limp did not obtain a fusion and has pain; the other, with solid fusion, has 4½ inches (11.43 cm.) of shortening.

With fusion, the resultant limp, unless shortening is marked or a good position is not obtained, is generally much less than before because pain, instability, abductor muscle weakness and malposition are no longer participating factors. With arthrodesis in good position and without too much shortening, the limp is only slight and not very noticeable.

Optimal Position for Arthrodesis: This has been found to be 20 or 25 degrees of flexion, neutral lateral or 5 to 10 degrees of abduction, depending on the amount of shortening present, and neutral or slight external rotation.

In this series at follow-up examination, the anteroposterior positions varied from 25 to 60 degrees, averaging 35. Severe flexion deformity, over 35 degrees, occurred three times. Ten degrees or more of adduction was found in three cases, internal rotation in three and excessive external rotation in three.

COMMENT

The experience with these relatively small series of cases indicates that reconstructive procedures in children generally result in control of dislocation and painless hips but with considerably limited ranges of mobility (table 4). Absence of pain, however, may not be permanent; for as these patients reach adult age

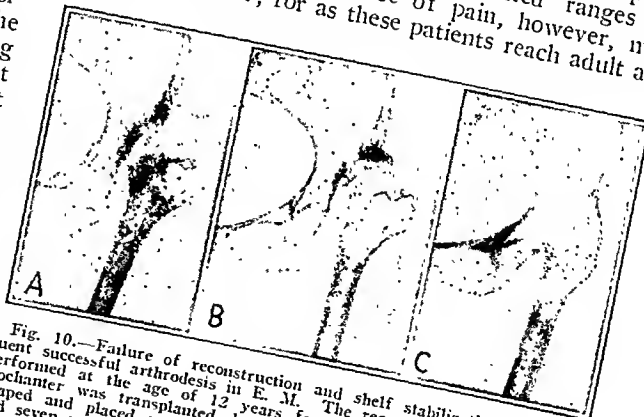


Fig. 10.—Failure of reconstruction and shelf stabilization and subsequent successful arthrodesis in E. M. The reconstruction operation was performed at the age of 12 years for a painful dislocated hip. The trochanter was transplanted downward, and the end of the shaft was shaped and placed in the acetabulum. Dislocation and pain recurred, and seven years later a shelf was turned down from the ilium. Severe pain continued, and three years subsequently an arthrodesis was performed with complete relief of symptoms. A, seven years after reconstruction operation and just before shelf stabilization. B, three years after shelf stabilization and just before arthrodesis. C, three years after arthrodesis. Result: solid fusion in 35 degrees flexion, 10 degrees abduction and neutral rotation and shortening 2 inches. The patient walks long distances.

pain will probably develop in many because this type of operation does not produce a very good joint mechanically. The arthroplasties accomplish this much better, but unfortunately many of the patients do not have

enough residual bony structure for this type of plastic procedure.

Well constructed and well placed shelves, unless absorption ensues, will provide dislocated hips with stability and fairly good ranges of motion. They will also check possible progressive ascendancy of the femur on the ilium with consequent increased shortening. Unless considerable irregularity of joint surface develops between femur, shelf and ilium, these hips should remain practically painless in adult life, but because of shortening and abductor muscle weakness, the patients will probably have marked limps.

It is the fusions, however, that can be relied on to provide stable hips free from pain and without marked limp unless a poor position is obtained or there is too much shortening. The best results are secured with unilateral involvement; but even when it is bilateral fusion may be indicated in combination with a mobilizing procedure on the opposite side in order to assure the patient of at least one painless and stable hip.

The previous presence of suppuration does not seem to be an absolute contraindication to a mobilizing procedure, but persons showing a marked proclivity to overgrowth of bone or evidence of considerable previous osteomyelitic involvement of juxta-articular bone which would have to be extensively opened at operation should probably not have a reconstruction or arthroplasty because of the prospect of further overgrowth of bone or reactivation of dormant bone infection. Fusion, if not already present, would be more advisable in such cases.

In deciding on a mobilizing operation, careful case selection should be made. For example, patients whose periarticular structures have become extensively scarred or whose muscles have been inactive following a longstanding ankylosis of the joint are not good subjects for procedures designed to secure or enhance motion. Probably very little movement can be maintained, and failure will result. Arthrodesis is again the operation of choice unless a mobilizing procedure is made mandatory by bilateral involvement, in which event the increased risk of failure must be accepted.

The time of operation is of great importance. It is advisable to wait at least two or three or even several more years after the cessation of all drainage or other evidence of activity.

Finally it must be emphasized that the only way to decrease the number of unfortunate persons requiring reconstructive and stabilizing surgical procedures because of the ravages of suppurative arthritis is to make an early diagnosis and to drain the joint immediately and adequately. The diagnosis must usually be made clinically, as x-ray changes in the bone are late and cannot be awaited. If the diagnosis is in doubt, an exploration with negative results is far better than to allow undrained pus to produce more and more involvement of circulation and destruction of bone.

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ABSTRACT OF DISCUSSION

DR. J. ALBERT KEY, St. Louis: Every reconstruction operation is a subterfuge. One does not know what else to do. I have never seen a reconstruction operation that I liked and the same is true here. I believe that a great many of these patients would have been a lot better off with a subtrochanteric osteotomy and no surgery on the hip joint. Preliminary traction should be given before a shelf operation is done. I realize that in old septic hips there is so much fibrous tissue that one cannot do much with traction; on the other hand, a preliminary loosening up can be followed by wire traction and

then placement of the shelf and postoperative treatment in a plaster cast, leaving the wire in the femur and fixing it in the cast in order to hold it down. The reason shelves absorb is because they do not function. The shelf does not have to be very large but it must be in the right position. If it is in the right position it will tend to increase in size. Arthroplasties are not good operations in children or even in adolescents. With the Smith-Petersen cup, of course, the whole question of arthroplasties is going to have to be reconsidered. We won't know the answer for some years. It is possible that later on by means of this new principle it may be possible to get satisfactory results in children. I have not had satisfactory results in arthroplasty of the hip in adults. I have not done them except in bilateral cases. I do not like the index of function based on the movement of the hip. The least important quality of the hip is movement. The most important quality of the hip is stability, the next is absence of pain, and finally comes the question of movement. I was struck by the fact that Dr. Hallock considers the straight position the ideal position. We are gradually getting away from the old idea that we want our hips abducted when we do an arthrodesis and are immobilizing our hips nearly in the straight position. I am pleased to have Dr. Hallock advise early operation in acute pyogenic infection of the hip. There is a great tendency to let the patient battle with the disease and then drain the abscess after an equilibrium has been established between the patient's resistance and the virulence of the organism. I believe that with an acute pyogenic infection of the hip joint it is better to operate early when one suspects the disease than it is to wait until one is sure that the disease is there and the joint is destroyed. It must not be forgotten, either, that we have all seen patients die of pyogenic infection who have not been operated on.

DR. FRANK D. DICKSON, Kansas City, Mo.: The problem of restoring to satisfactory use a hip joint damaged in childhood or adolescence by suppurative arthritis is a very complex one. This is demonstrated by the fact that four different procedures were carried out for this purpose at the New York Orthopaedic Hospital. In the hip joint instability and deformity are responsible for most of the disability, and these two factors must be overcome if a satisfactory weight bearing extremity is to be anticipated. The preservation of a useful amount of motion in the hip joint is highly desirable, and in bilateral involvement imperative but sacrificing stability and satisfactory alignment in favor of limited and often unusable motion is never wise. The series reported by Dr. Hallock indicates that, while many excellent results were obtained by arthroplasty and shelf operations, by far the most satisfactory cases in the series are those in which an arthrodesis was performed, the reason being that, by arthrodesis, stability was provided and a proper alignment secured, so that weight bearing could be satisfactorily carried out. My experience with reconstruction operations and shelf operations in hip joints damaged by suppurative arthritis parallels that reported by Dr. Hallock. The unreliability of the results in plastic operations has convinced me that, in the management of such joints, fusion is by far the most dependable operation. Attempts to preserve motion in a hip joint damaged by suppurative arthritis often interfere with the primary objective of securing stability and satisfactory alignment. Procedures aimed at securing a movable hip joint should be reserved for selected cases. The obstacles to success in the usual case are four: 1. Most of these hips are in a position of pathologic dislocation and show a marked tendency to return to this position after operation. 2. The extensive destruction which is usually present leaves but little head and neck for reconstructive surgery. 3. The extensive fibrosis of the periarticular structures present usually reproduces itself after operation, often to a greater extent than before, and interferes with the establishment of satisfactory motion. 4. It is difficult to build up muscle control of the joint, owing to atrophy and fibrosis of the muscles which control the movements of the joint. There is perhaps something more encouraging in the future.

DR. EDWIN W. RYERSON, Chicago: Many of these suppurative arthritides occur in early infancy. They used to be called the acute epiphysitis of infancy. In many of the cases which

I have seen the entire head and neck were absorbed and disappeared and there was nothing left but the straight shaft with the trochanter playing up and down on the side of the ilium, producing a great deal of instability and but little pain. A good deal of shortening occurs in such cases, and years ago, soon after Lorenz's bifurcation operation was brought out, I began doing a high Lorenz bifurcation of the upper end of the femur, and the results were highly satisfactory because good stability and good motion were attained. It has recently seemed possible that the Colonna operation of denuding the upper end of the greater trochanter from its muscle attachments and placing the upper end of the trochanter in the acetabulum might produce more lengthening than is obtained by the other methods, and a good deal of motion. I am greatly in favor of having some motion in the hip joint if one can possibly get it when it can be combined with stability and painlessness. So I am willing to take chances on making painless and movable hip joints in individuals of reasonable age, because one can always perform an arthrodesis of the hip joint as a last resort. I appreciate Dr. Hallock's paper and I think it covers an important field, although nowadays one does not seem to observe so many cases of suppurative arthritis as were seen fifteen or twenty years ago.

SOME PECULIARITIES IN THE GEOGRAPHY OF CANCER

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In discussions of the relationship of climate and geography to health, attention has been especially directed toward communicable diseases. This perhaps is to be expected, since these are the diseases against which most control measures have been directed. Geographic variations in the prevalence of conditions due to other

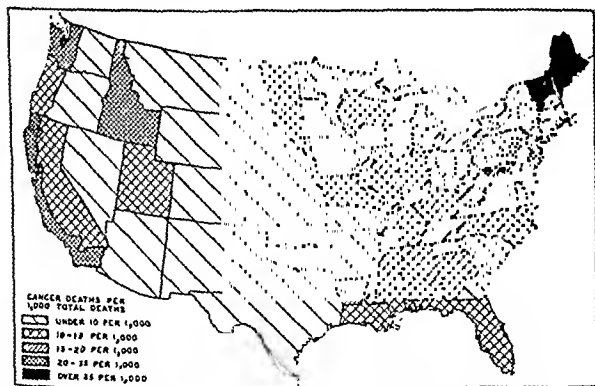


Fig. 1.—Number of deaths from cancer per thousand deaths from known cause, 1880.

possible factors, however, have not been overlooked. Of particular interest with respect to cancer is the fact that Dr. John S. Billings pointed out the wide geographic variation in cancer mortality as revealed by the United States Census of 1880 (fig. 1). Although the data were admittedly incomplete, they indicated that cancer most frequently occurred among persons living

in the states extending from New England to the Great Lakes and in the Pacific Coast states.¹

Among the items taken up for study by the United States Public Health Service after the passage of the National Cancer Institute Act of 1937 was the distribution of cancer in the population. Two sources of data were used: certificates of death and reports of cases under treatment. Partial figures presented on this occa-

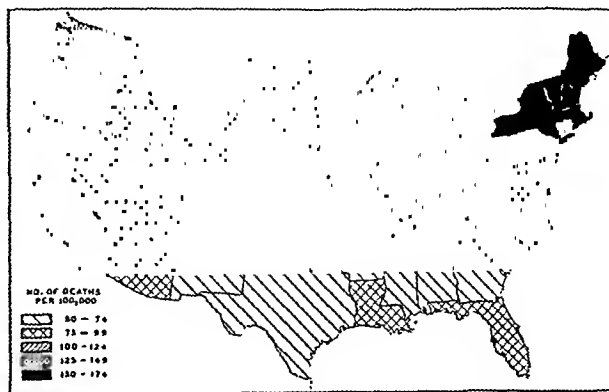


Fig. 2.—Number of deaths from cancer per hundred thousand of total population by states, 1937.

sion are taken from more extensive material.² The term "cancer" as used in this paper includes new growths of all types having inherent malignant characteristics. Mortality data will be presented first. These were obtained from basic tabulations of the Vital Statistics Section of the Census Bureau, which show greater detail than the annual reports on mortality statistics.

Crude death rates from cancer vary widely throughout the country (fig. 2). The extreme situations may be cited to illustrate this point. In Rhode Island, 156 persons per hundred thousand of total population died of cancer during 1937, as contrasted with the corresponding rate of fifty-two for South Carolina. In other words, three times as many people, in relation to the total population, succumbed to cancer annually in the state of highest as compared with the one of lowest experience.

Although these two states have been singled out as representing the extremes, differences only slightly less in magnitude exist among other states and groups of states. The experience of New York and of New England is between two and three times that which obtains in the South. The states around the Great Lakes and bordering the Pacific Ocean also have rates well above the average for the entire country.

Certain obvious explanations for these variations immediately come to mind, and no doubt these are operative in some degree. Aside from a few notable exceptions, states with the highest rates have populations that are largely urban; consequently they may be expected to have available superior facilities for diagnosis. Moreover, the states with the lowest death rates from cancer are also states where an appreciable proportion of the deaths are certified as being due to senility and other vague or ill defined causes. If

1. Billings, John S.: Report on the Mortality and Vital Statistics of the United States, as Returned at the Tenth Census, Washington, D. C., Government Printing Office, 1885.

2. Cover, Mary: The Trend in Cancer Mortality, Original Registration States 1900-1936, Public Health Bulletin, to be published; Distribution of Cancer Mortality in Continental United States, 1936, *ibid.*, to be published. Mountin, Joseph W.; Dorn, Harold F., and Boone, Bert R.: The Incidence of Cancer in Atlanta, Georgia, and in Surrounding Counties, Pub. Health Rep. 54:1255 (July 14) 1939; similar data for other areas, to be published.

more specific diagnoses were obtained, it is possible that some of these deaths from indefinite causes would be attributed to cancer, although the larger number probably result from diseases of the heart and arteries, disorders of the kidney and other common ailments of the aged. It is not believed that varying degrees in specificity and accuracy of diagnosis would account

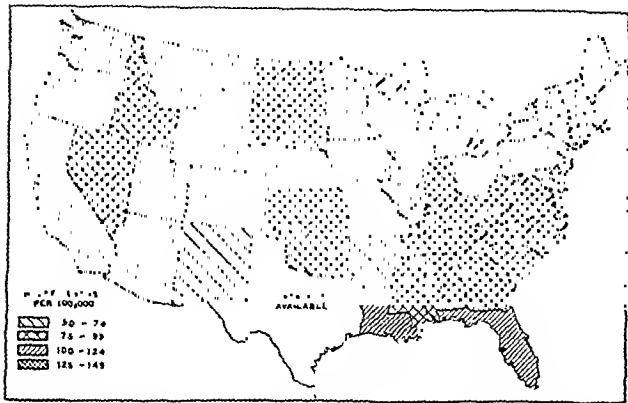


Fig. 3.—Standardized death rate from cancer per hundred thousand of population, 1937.

for more than a small percentage of differences in mortality rates.

A more important factor likely to affect the crude death rate is the diversity in the composition of the population among the states. The usual method of taking account of differences in the composition of the population is to adjust rates to a standard population.³ It may be appropriate to add a word of caution, to the effect that adjusting for age and race reduces the geographic variation in mortality but does not entirely

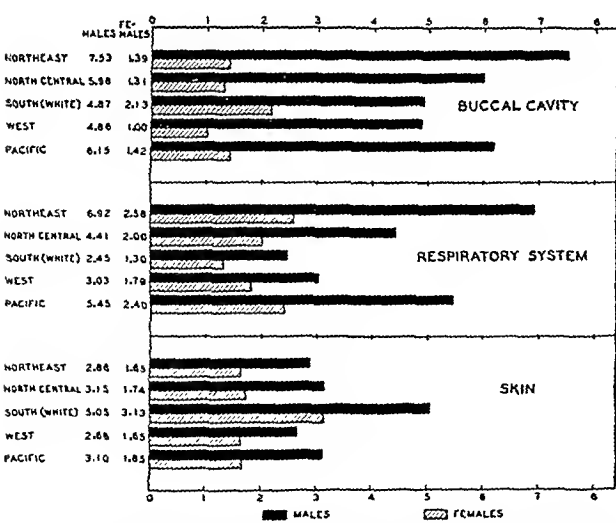


Fig. 4.—Average annual death rate per hundred thousand of population from cancer of the buccal cavity, respiratory system and skin by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

eliminate it. Since the mortality from cancer is less among Negroes than among white persons, the standardized rates for the Southern states are based on the white population only.⁴ Rates standardized for age are shown in figure 3.

3. The standard population used is the population of the United States in 1930.
4. The rates refer to the white population in Alabama, Arkansas, California, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Virginia.

After age adjustments have been made, the resulting standardized rates in New York and Rhode Island are still twice those in Arkansas and New Mexico, with the general pattern of geographic variation remaining similar to that for the crude rate. It is interesting to note that Louisiana and Florida each occupies a position more than 25 per cent above that in the other Southern states. This may be no more than a coincidence for Florida, a state southern only by location since half of its population were born outside the state; but the data in respect to Louisiana may have significance, as more than 85 per cent of the inhabitants are native to that state.

Mortality from cancer by anatomic sites and by geographic regions is shown in figures 4 to 9. Figures 4 and 5 present data for groups of sites, while figures 6 to 9 show corresponding data for individual sites. These rates also have been adjusted for differences in age composition. Directly opposite to the distribution

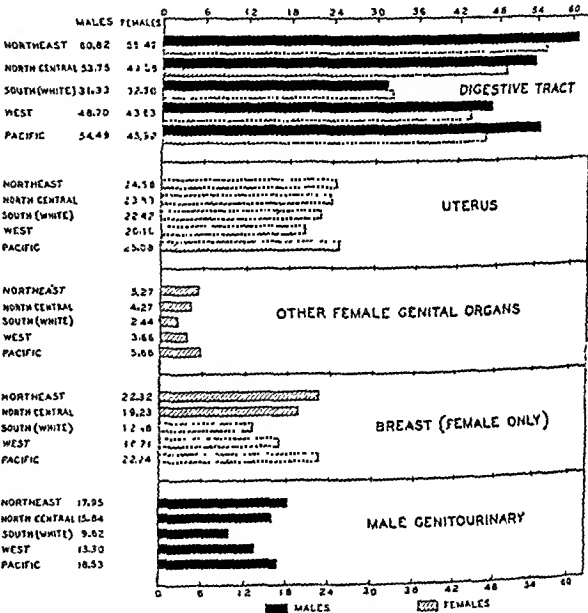


Fig. 5.—Average annual death rate per hundred thousand of population from cancer of certain selected sites by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

of total cancer mortality is that of the skin alone. Lesions of this site claim proportionately more victims, both male and female, in the South as compared with the remainder of the country, but among other regions the difference is of little moment (fig. 4). It has been suggested by some that the higher mortality in the Southern states may result from greater exposure to the sun. However, the Western states, many of which also have a very hot season and relatively more clear weather throughout the year, report the lowest mortality from skin cancer.

Lesions of the buccal cavity show an interesting sex difference in the geographic variation picture. The mortality among males follows the pattern for all cancer, being highest in the Northeast and lowest in the South

5. The states in the five regions are as follows: Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia. North Central: West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri. South: Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Oklahoma, Louisiana. West: North Dakota, South Dakota, Nebraska, Kansas, Montana, Idaho, Utah, Wyoming, Nevada, Colorado, Arizona, New Mexico. Pacific: Washington, Oregon, California.

and West. For females, however, rates are highest in the South, lowest in the West and practically equal in the other regions. The cause of this difference is not apparent. From the standpoint of magnitude, the difference is most pronounced for cancer of the pharynx and mouth although some inequality obtains for each specific site (fig. 6).

While mortality from cancer of the pharynx and mouth is especially high among Southern white females as compared with those of other regions, a high rate is also characteristic of Southern white males. The same statement, however, does not apply to cancer of the tongue, which is less frequent among Southern white males than among males in the Northeast, North Central and Pacific states. Mortality from cancer of the lip shows little geographic variation except for the South, where it is low for males and high for females (fig. 6).

Mortality from cancer of the uterus presents a situation dissimilar from that of other sites in that there

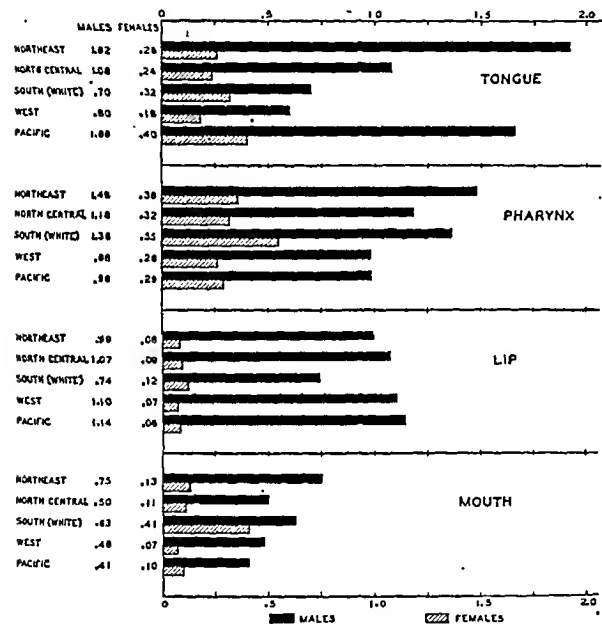


Fig. 6.—Average annual death rate per hundred thousand of population from cancer of the tongue, pharynx, lip and mouth by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

is almost no geographic variation (fig. 5). In contradistinction, the death rate from cancer of the other female genital organs follows the usual geographic pattern. Statements somewhat similar to the latter may be made in respect to cancer of the male genito-urinary system, digestive tract and breast.

Nothing especially important from a geographic standpoint was revealed by the study in regard to malignant conditions of the larynx, lungs and other respiratory organs (fig. 7).

Prostatic malignant change produces a rate that is more than 50 per cent higher in the rest of the country than it is in the South (fig. 8). From this aspect it is similar to mortality from cancer of the kidneys but different from cancer of the bladder, which is highest in the Northeast, North Central and Pacific regions but lowest in the South and West.

Except for the South, cancer of the stomach is universally the most common form of fatal cancer among males, ranking with cancer of the breast and uterus

among females (fig. 9). Much the same picture is presented by mortality from cancer of the liver, except that the Pacific Coast states also constitute an area of relatively low rate. The geographic distribution of fatal cancer of the intestines and other parts of the digestive tract is very similar to that already described for all forms of cancer combined.

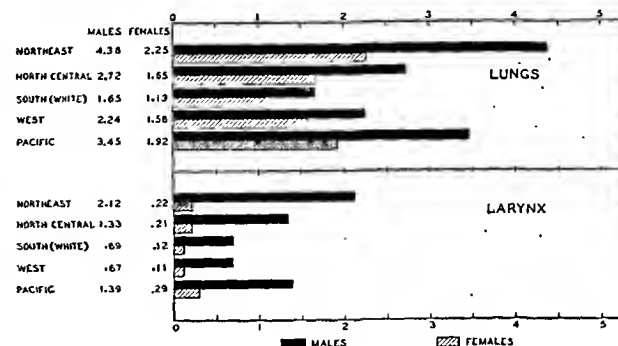


Fig. 7.—Average annual death rate per hundred thousand of population from cancer of the lungs and larynx by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

It is well known that some forms of cancer pursue a more rapid and fatal course than others. For example, cancer of the stomach usually terminates in death shortly after diagnosis, while a person may live for many years and perhaps die of another cause should the skin only be involved. Conclusions, therefore, based on mortality records will differ from those drawn from morbidity reports not only as to the amount of cancer in the population but also in respect to the tissues or organs involved. Furthermore, as therapeutic methods become more effective, the types of cancer most easily arrested will appear less and less frequently in mortality records.

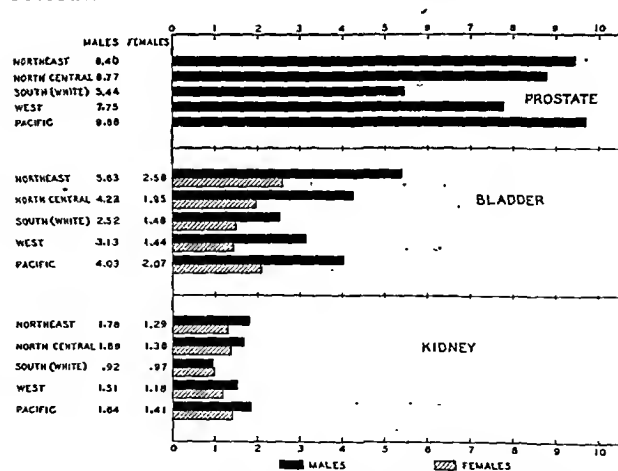


Fig. 8.—Average annual death rate per hundred thousand of population from cancer of the prostate, bladder and kidney by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

Because of these considerations, a number of studies have been initiated by the United States Public Health Service in representative sections to determine the morbidity from cancer and its variation from one part of the country to another, between the two sexes, between white persons and Negroes and at different ages. Field methods used are described in another paper of the cancer statistics series, but it may be well to repeat that the data are obtained directly from physi-

cians, hospitals and clinics and cover patients seen within a specified year (Mountin, Dorn and Boone²). Individuals are sufficiently identified to exclude factors of error that might be introduced by residence and duplication of reports.

The several areas chosen for the complete study give representation to the main geographic divisions of the continental United States. Preliminary data for total

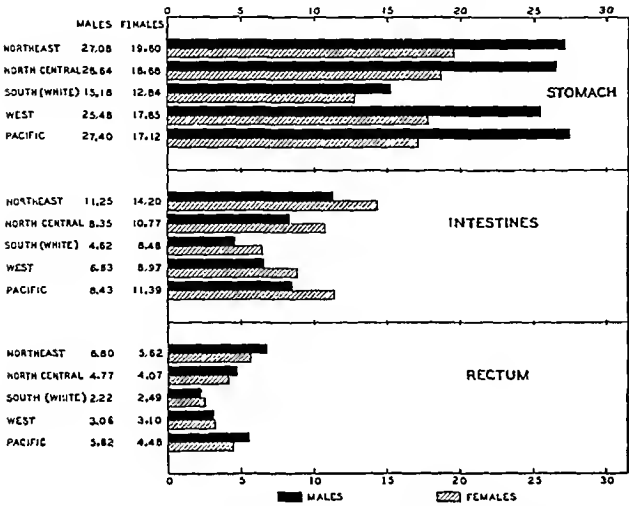


Fig. 9.—Average annual death rate per hundred thousand of population from cancer of the stomach, intestines and rectum by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

cancer have been tabulated for areas⁶ centering around Atlanta, Chicago, Detroit, Pittsburgh and New Orleans; these are presented in figure 10. Considerable variation in case rates for cities of the same region may be noted, but the difference between Northern and Southern cities is impressive. The case rates of illness, unlike the mortality rates, are higher in the South than in the North, those for the Southern area being about one-third higher than the rates in the Northern area. Expressed as a ratio of cases to deaths, the incidence of cancer ranges from 2.6 in Chicago to 5.3 in Atlanta.

The more detailed analysis by site has been completed on information from the Atlanta and the Chicago areas. On this occasion bodies of data from Atlanta and Chicago are used to illustrate geographic differ-

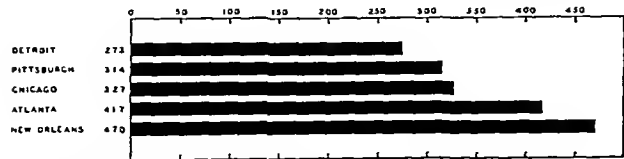


Fig. 10.—Number of cases of cancer per hundred thousand of total population for selected cities, 1937.

ences in the incidence of cancer and to show how figures based on morbidity reports vary from those derived from recorded deaths. When interpreting the figures hereinafter presented, one should remember that regardless of how the incidence of cancer is expressed—whether as the number of cases per death or, as the number of cases per unit of population—the estimated figure will depend in great measure on the accuracy

6. The Atlanta area includes the following counties of Georgia: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Forsythe, Fulton, and Barnett. Cook County, Ill.; Wayne County, Mich.; Allegheny County, Pa., and Orleans Parish, La., comprise the areas respectively designated as Chicago, Detroit, Pittsburgh and New Orleans.

of diagnosis, the effectiveness of therapeutic methods, and the stage at which the disease is recognized. In any survey of the type described certain cases are missed because of faulty diagnosis or because of their not having come to medical attention, but for all practical purposes it is not possible to obtain information on other than cases of diagnosed cancer. As a consequence, the number of cases of cancer referred to in this paper really represents the number of unduplicated persons with diagnosed cancer who came to the attention of a physician, hospital or clinic during the calendar year previous to the survey.

In a community where a high proportion of diagnoses are unduly delayed, the recorded number of cases may be only slightly greater than the recorded number of deaths. For example, if each patient lives just one year after a positive diagnosis, the case rate in any given year will be equal to the mortality rate of the following year. On the other hand, if each person with

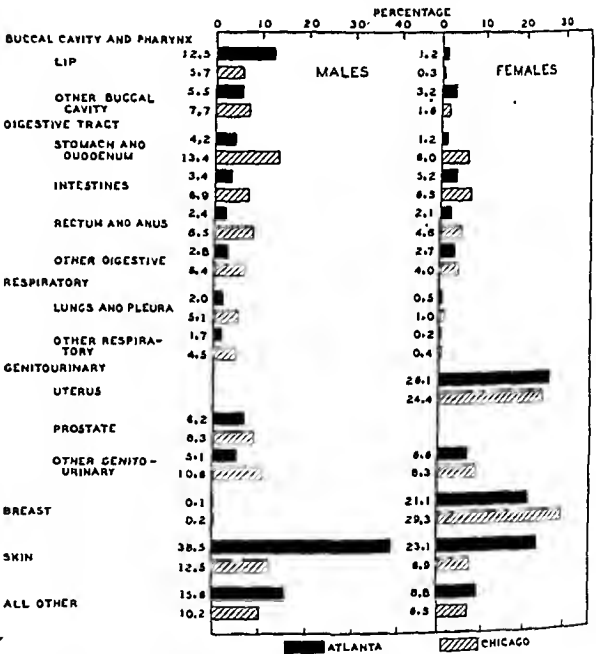


Fig. 11.—Percentage of reported cases of cancer by primary site and sex for white persons in Atlanta, Ga., and Chicago, 1937.

cancer should live, on the average, five years after diagnosis, the incidence rate at any time will be five times the mortality rate five years later. While the effect of delayed diagnosis cannot be entirely eliminated, an attempt has been made to minimize its influence by undertaking the study only in areas having superior medical, hospital and clinical facilities that are reasonably accessible to all groups of the population.

The higher case rates of illness from cancer in the South arise, in part at least, from a higher incidence of skin cancer (fig. 11). Nearly two of every five cases of cancer among white males reported in Atlanta affected skin as compared with one of eight in Chicago. For white females the proportions, although smaller, show about the same relative difference, 23 per cent in Atlanta and 7 per cent in Chicago. Similarly cancer of the lip in relation to all forms was reported twice as frequently for white males and four times as frequently for white females in Atlanta as compared with Chicago. These two types of lesions made up 57 per cent of all cancers among white males and 24 per cent

of all cancers among white females in Atlanta but only 27 per cent and 7 per cent, respectively, in Chicago.

On the other hand, the digestive tract and the respiratory system were reported as sites more frequently in Chicago than in Atlanta, the corresponding percentages being 45 for white males and 23 for white females in Chicago as compared with 16 for white males and 10 for white females in Atlanta.

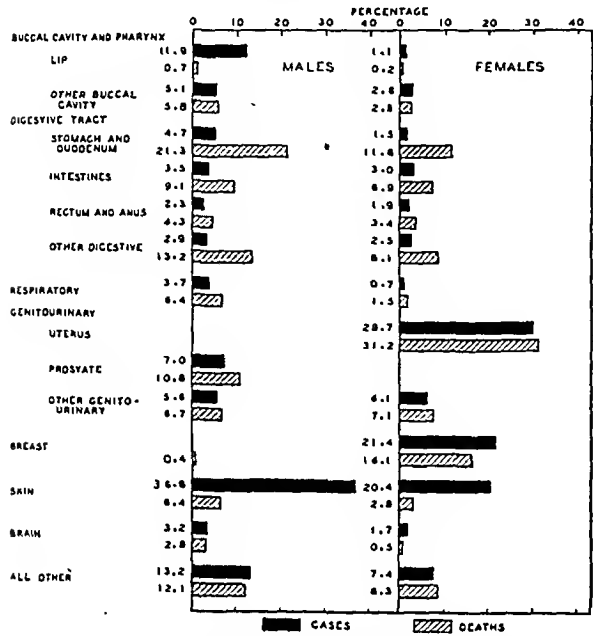


Fig. 12.—Percentage distribution by primary site and sex of reported cases and recorded deaths from cancer in Atlanta, Ga., and surrounding counties, 1937. (The deaths are for the state of Georgia.)

For specified sites the occurrence of cancer varied markedly when measured by morbidity as compared with mortality reports (figs. 12 and 13). In some measure this may arise from the fact that tumors of one type are more malignant than those of another or because of varying susceptibility to treatment. In Atlanta cancer of the skin, to which is attributed 37 per cent of all cases among males and 20 per cent among females, accounts for only 6 per cent of the male deaths and 3 per cent of the deaths among females. On the other hand, malignant tumor of the digestive tract, which causes nearly 50 per cent and 30 per cent, respectively, of all male and female deaths from cancer, is reported about one-fourth as frequently among cancers in living patients for this locality.

In Chicago the same general relationships between cancer in dead and in living patients hold true, although the proportions are quite different. Cancer of the digestive tract is reported as the primary site for 55 per cent of the fatal tumors but for 35 per cent of the tumors in living patients among males; the corresponding figures for females are 42 and 20, respectively. The rectum and anus are the only tumor sites in the digestive tract reported as frequently among tumors in living as among those in dead patients.

No attempt has been made in this paper to do more than point out the existence of geographic variations in the occurrence of cancer. That such variations exist, there can be no doubt. The explanation of these differences must await further investigation into the causes of cancer. However, the existence of significant

differences not only in the total amount of cancer but also in the types of lesions indicates that contributory factors, perhaps multiple and varied, may be found in the environment.

ABSTRACT OF DISCUSSION

E. V. COWDRY, PH.D., St. Louis: This paper is a concise report on the beginning of a systematic, large scale analysis of the factors for and against cancer. To distinguish the geographic ones from the others is difficult. The authors have mentioned corrections for age and for standardized population and I hope that they will explain these corrections a little further. There is also the possible factor of race. In the North both white persons and Negroes appear to have been included in these statistics, while in the South the Negroes were not taken into consideration. On the whole it is possible when the groups studied in different parts of the country are selected on the basis of similarity in age, race, economic status and other factors that the striking differences in cancer incidence described will be reduced.

DR. J. N. BAKER, Montgomery, Ala.: The data accumulated by the Public Health Service under the direction of Dr. Mountin seem to confirm amply the frequently observed fact noted by Southern clinicians that there is considerable predominance of cancer of the skin among the white population of the South, which predominance is even more marked in the rural portion of its population. On the other hand, the Negro, whose body is probably even more exposed to the sun's rays, appears to be nothing like so susceptible to the development of cutaneous cancers. His skin pigmentation, no doubt, is accountable at

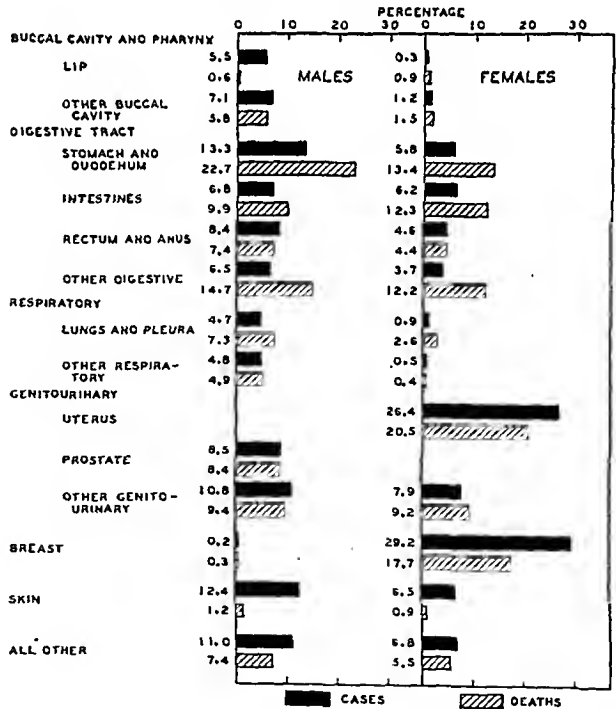


Fig. 13.—Percentage distribution by primary site and sex of reported cases and recorded deaths from cancer in Cook County, Ill., 1937.

least in part for such immunity. Such a thoroughgoing, comprehensive study in the cancer field is badly needed and, when completed, should place at our disposal a wealth of useful information.

DR. FREDERICK G. MURRAY, Cedar Rapids, Iowa: This study of the geographic distribution of cancer is most interesting. One point about bright sunlight and the prevalence of skin cancer is the matter of exposure. The incidence of cutaneous cancer in southern California is considerably less than in other Southern states. There is the same brilliant sunlight in southern California as in other parts of the South; the low incidence

of cutaneous cancer in California may be due to the comparative lack of exposure of the white population there to the sunlight. In California the rural outdoor work is done almost exclusively by the Oriental and Mexican laborer, whose pigmented skin protects him from the effects of sunlight. In the other Southern states a much larger proportion of the white population engages in outdoor field labor and is correspondingly more exposed to sunlight, thus accounting for the greater prevalence of cutaneous cancer in these other Southern states.

DR. JOHN A. FERRELL, New York: I wish to inquire if this paper is to be the first of a series, so that later factors will be treated that were not discussed here. It is presumed that comparisons of groups by age will be made. Might not the recognized high average age of the population in New England and California account in part for their high cancer mortality? Is not the cancer rate notably high in particular racial groups? Does not occupation exert an influence on rate? In computing cancer rates, I wonder how the authors arrived at their population basis. If the 1930 census is employed, considerable change may have occurred in certain communities during the past nine years and might account for some variation.

DR. A. G. HENDERSON, Imboden, Ark.: I have two questions to ask: Has cancer increased greater in the last twenty years than the population of the United States? What effect has the treatment of cancer had in reducing the mortality in the last twenty years?

DR. JOSEPH W. MOUNTIN, Washington, D. C.: To answer many of the questions raised in the discussion would require data of a different type than those on which this study was based. Our data were limited to a few items such as residence, age and sex of the patient and site of the cancer. These were obtained through mortality records and a special incidence survey. With but few exceptions each report of cancer used represents a diagnosis by a physician. For administrative reasons it was necessary to limit the number of questions asked. I may add, however, that the Public Health Service now has in progress an epidemiologic study of cancer involving the collection of data much more detailed in character than those described. This epidemiologic study is being done in connection with several well organized cancer clinics. Its primary purpose is to determine the significance that may be attached to the various clues advanced by clinicians as to factors associated with the occurrence of cancer. No figures on cancer among Negroes were used in the paper we have presented. Such exclusion was necessary to insure comparability between geographic areas. For the incidence portion of our study, figures were gathered from certain large cities in each of several geographic regions. Extending the study to rural areas would have entailed very high costs; furthermore, differences between large medical centers and rural areas in the availability and use of good diagnostic service probably would have invalidated any direct comparison between the cancer experience of urban and rural inhabitants. The factor of occupation in connection with cancer could not be assayed on the basis of data used for this paper. This, however, is being attempted in the epidemiologic study which I have mentioned. The factor of age was taken into account by the usual method of computing standardized rates for each state on the basis of the age distribution of the population of the United States in 1930. Cancer mortality is on the increase. The part of this increase that is due to changing age composition of the population can be estimated. Improvement in diagnosis is another factor but its effect varies with the character of local facilities and the site of the cancer.

DR. FERRELL: Did you take the occupational factor into consideration?

DR. MOUNTIN: No. We had to choose between what we could get and what we would like to get. We made our questionnaire. We sent it around. If it had been too extensive we should have had difficulty in getting it filled out and, furthermore, occupation is a difficult thing to classify. You have to get down much beyond the mere gross classification of population and get into exposure to different irritants and other factors that might have something to do with the causation of cancer. We are doing that in our epidemiologic study, but those data are not in the incidence study on which we have just reported.

Clinical Notes, Suggestions and New Instruments

CHEILITIS, FIXED DRUG ERUPTION AND GASTRO-INTESTINAL ALLERGY FROM EOSIN DYE OF LIPSTICK

RUDOLPH HECHT, M.D.; B. Z. RAFFAPORT, M.D., AND
LEON BLOCH, M.D., CHICAGO

Mrs. P. W. W., aged 43, white, was referred to us in March 1936. She complained of itching eyelids, scaling and redness of the skin about the eyes and an eruption at the corner of one eye. The symptoms began in August 1934. The itching had persisted since then with exacerbations and remissions. A physician advised the use of "nonallergic" cosmetics and prescribed solution of potassium arsenite and calcium. She did not improve on this regimen; in fact, her skin became more irritated. One of us (L. B.) diagnosed gastrointestinal allergy in 1935, the symptoms of which were frequent bowel movements (composed largely of mucus), cramps and pencil-like stools. The physical and laboratory examinations at that time revealed no abnormalities. The information obtained during her first visit was that she was using perfumes, toilet waters, talcums, face powder, various creams, liquid nail polish, "henna," rouge and lipstick. On examination the following was noted: The skin of the face showed generalized erythema. On the area adjoining the outer side of the left eye there was a slightly elevated, roughly triangular, peanut sized, lichenified plaque, of dusky red violaceous color, which was sharply demarcated from the surrounding skin. The skin in back of both ears was erythematous and scaling, while the lips were dry, fissured and scaling. There was moderate dry scaling of the scalp.

At the first visit cosmetics were suspected. Therefore the patient was advised to discontinue the use of all cosmetics. Intracutaneous tests were made with all the common foods in an attempt primarily to discover the cause of the gastrointestinal symptoms. These tests all gave negative results except for a questionable reaction to banana, which clinically proved to be of no significance.

After avoidance of cosmetics for one week it was noted that the redness of the face had subsided and that the skin behind the ears was now completely clear. Also, to our surprise, the abdominal distress had completely subsided. At this visit she begged to be allowed "at least the use of lipstick," since she was unable to go among her friends "looking like a ghost." Two days after the resumption of the use of lipstick the eruption at the corner of the eye and the abdominal distress reappeared. Patch tests were then made with all the cosmetics that had been used. The lipstick gave a 4 plus reaction with erythema, edema and severe vesiculation. In order to explain why no improvement had occurred when the "nonallergic" cosmetics had been used, a patch test was made with the "nonallergic" lipstick. This also gave a 4 plus reaction. Samples of the constituents of this lipstick were obtained from the manufacturer and were used for patch tests. All were negative except for brom acid (tetrabromofluorescein), which gave a 4 plus reaction. The old sites of patch test reactions flared up after this reaction.¹ Erythema of the face in the areas of the previous cutaneous eruption occurred with the positive cutaneous reaction on the arm.

Various bromofluoresceins and other dyes commonly used in lipsticks were supplied to us by the Ar-Ex Cosmetic Company, Inc. Patch tests with these dyes were negative except for the tetrabromofluoresceins. A lipstick prepared by this company containing no "indelible" dye was negative on patch test. The patient has for the past three years used "nonindelible" lip rouge and has resumed the use of all other cosmetics and perfumes with no recurrence of the cutaneous or gastrointestinal symptoms. No dietary restriction has been necessary. The disappearance of the gastrointestinal symptoms was particularly

From the Department of Physiological Chemistry, University of Illinois College of Medicine, and Michael Reese Hospital.
1. Stauffer, H.: Die Ekzem Proben, Arch. f. Dermat. u. Syph. 162: 517, 1931.

interesting. During the past three years we have attempted several times to induce her to try the ingestion of capsules containing a small amount of tetrabromofluorescein. We were interested in knowing whether the gastrointestinal symptoms and the eruption would return. She has, however, refused to swallow any of the dye, preferring to "let well enough alone."

The interesting facts indicated by this study are the presence of cheilitis, a patch of dermatitis of the "fixed" type and of gastrointestinal symptoms. The elimination of the bromofluorescein dye from the lipstick resulted in the disappearance of the symptoms. There has been no recurrence for the past three years. We believe it is probable that the cheilitis was a contact dermatitis due to the tetrabromofluorescein dye in the lipstick. That these dyes can cause this type of dermatitis is well known. The role of this substance as an etiologic factor in lipstick dermatitis has been thoroughly studied by Sulzberger and Goodman.² That it was the causative factor in our case was proved by:

1. Positive patch test with the lipstick.
2. Positive patch test with the tetrabromofluorescein used in the manufacture of the lipstick.
3. Negative patch tests with the other ingredients of the lipstick.
4. Improvement of symptoms when the use of lipstick was stopped.
5. Return of symptoms when the lipstick was again used.
6. Negative patch tests with a lipstick free from tetrabromofluorescein.
7. Complete clinical relief for a period of three years after substitution of such a lip rouge.

The peculiar patch of dermatitis near the eye was not characteristic of a contact type dermatitis, although the dye could have been carried there by the fingers. However, if this lesion near the eye was the result of dye carried there by this means it is difficult to understand why the eruption was limited to such a small area rather than involving the eyelids, which are more commonly affected by such contact. It is possible that this site was an area of local sensitization. Since this patch was sharply circumscribed, did not contain vesicles, was violaceous, disappeared on removal of the offending agent from the lips and reappeared when the lipstick was reapplied to the lips, it may possibly have been a lesion of the fixed drug eruption type due to the ingestion of the eosin dye.

We know of no reported case of such an eruption due to this dye. Unfortunately we were unable to feed the dye and observe the effects. Sulzberger and Wise,³ Abramowitz⁴ and Abramowitz and Noun⁵ have thoroughly studied fixed drug eruptions due to phenolphthalein. Similar eruptions have been reported due to antipyrine, allurate and arsphenamine.

The gastrointestinal symptoms were especially interesting and may be of importance in explaining other obscure cases of vague gastrointestinal symptoms frequently complained of by women.

Various substances of relatively simple structure (i. e. not proteins) are capable of causing gastrointestinal allergic symptoms.⁶ It is possible that these substances act as haptens and take on the character of full antigens by union with body proteins, as suggested by Wolff Eisner in 1907. In fact, the recent work of Rosenthal⁷ with phenolphthalein in which he believes he has demonstrated *in vivo* union of hapten to protein may be significant in this regard.

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4. Abramowitz, E. W.: Reactions Due to Phenolphthalein: A Study of Their Pathogenesis. *Arch. Dermat. & Syph.* 31: 777 (June) 1935; Role of Allergy in Drug Eruptions, *New York State J. Med.* 37: 128 (Jan. 15) 1937.

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SUMMARY

This case of contact dermatitis, possible "fixed drug" eruption and gastrointestinal allergy was due to tetrabromofluorescein in a lipstick.

The general use of lipsticks containing tetrabromofluorescein or related dyes by American women may explain many obscure cutaneous eruptions, especially of the "fixed" type, and may explain some cases of gastrointestinal disturbances of the nature of spastic colitis or mucous colitis.

25 East Washington Street.

RESISTANCE TO PROTAMINE ZINC INSULIN WITHOUT
RESISTANCE TO REGULAR INSULIN IN
DIABETES MELLITUS

JAMES A. GREENE, M.D., AND O. D. THATCHER, M.D.
IOWA CITY

Temporary resistance to insulin in diabetes mellitus is not an uncommon occurrence, but resistance to one type of insulin without resistance to another is rare. It is for this reason that we are reporting a case in which there was resistance to protamine zinc insulin and not to regular insulin.

REPORT OF CASE

A white woman aged 27, single, entered the University Hospital Aug. 3, 1938, because of an acute inflammation of the left external ear and diabetic acidosis. Diabetes mellitus had been present for eleven years and had been treated haphazardly with insulin and modifications of the diet. Growth ceased shortly after the appearance of the diabetes, and the secondary sex characteristics did not develop nor did menstruation occur. For six months prior to admission the diabetes became more severe and was not adequately controlled, although more vigorous treatment was instituted. A furuncle developed in the left

Doses of Insulin, Potential Intake of Dextrose and Amount of Glycosuria

Date	Potential Dextrose	Regular Insulin	Protamine Zinc Insulin	Urine Dextrose 24 Hours
9/12/38	170	25, 5, 15, 15	0	0
9/13/38	170	25	45	80
9/14/38	170	25	45	87
9/15/38	170	25	45	65
9/16/38	170	0	45	73
9/17/38	170	0	45	75
9/18/38	170	0	45	53
9/19/38	170	0	45	90
9/20/38	170	0	45	110
9/21/38	170	0	50 15	110
9/22/38	170	0	50 15	122
9/23/38	170	0	50 15	120
9/24/38	170	0	50 15	83
9/25/38	170	0	50 15	105
9/26/38	170	0	50 15	145
9/27/38	170	0	50 15	160
9/28/38	170	0	50 15	145*
9/29/38	170	25, 5, 15, 15	0	27
9/30/38	170	25, 5, 15, 15	0	10
10/1/38	170	25, 5, 15, 15	0	0

* Carbon dioxide combining power 26 volumes per cent.

external auditory canal three days before admission, and the infection spread to the auricle. The patient lapsed into coma and was sent to the hospital immediately.

The patient was small, thin and underdeveloped and appeared to be about 16 years of age. She was in a semicomatose condition. The left external ear was acutely inflamed, with pus exuding from the canal. Large amounts of dextrose and acetone were in the urine. The blood sugar concentration was 367 mg. per hundred cubic centimeters and the carbon dioxide combining power was 17 volumes per cent.

The acidosis was controlled by the administration of dextrose and regular insulin. The infection subsided after incision of the left auricle. The diabetes was finally controlled with insulin in doses of 5 units at midnight, 25 units before breakfast, 10 units at noon and 20 units before supper, and a diet of three meals daily containing 170 Gm. of potential dextrose.

From the Department of Internal Medicine, State University of Iowa College of Medicine.

Elimination of the midnight dose of insulin or alteration of the time of administration resulted in moderate to extreme glycosuria. The regimen was changed, therefore, to four meals daily, at 7 a. m., 11:30 a. m., 5 p. m. and 10 p. m. Insulin was administered before each meal in doses of 25, 5, 15 and 15 units. The glycosuria was controlled for approximately two weeks before protamine zinc insulin was substituted for regular insulin. It is to be noted from the table, which shows the doses of insulin, potential intake of dextrose and amount of glycosuria, that the protamine zinc insulin was ineffective and that acidosis developed. The return to regular insulin in the previous doses promptly controlled the glycosuria by the third day. Another attempt (twenty-eight days later) to use protamine zinc insulin in daily doses of 90 units resulted in a glycosuria of from 30 to 33 Gm. daily. This glycosuria subsided when regular insulin was again administered. Positive reactions followed the intradermal injections of protamine zinc insulin in this patient, whereas negative reactions were obtained in other diabetic patients; also this patient failed to react to regular insulin thus administered.

COMMENT

We have been able to find only one report in the literature of resistance to protamine zinc insulin without resistance to regular insulin. John's¹ patient had hemochromatosis, but there was no evidence of this malady in our case. The cause of such resistance is not clear. That the protamine zinc insulin was active was shown by the fact that another patient received insulin from the same vials and her diabetes was controlled. The protamine zinc insulin appeared to be absorbed, as evidenced by the absence of masses beneath the skin at the sites of injection. It is generally believed that protamine zinc insulin is retained at the site of injection, and this is supported by the observations of Allen.² It appeared probable, however, that the protamine zinc insulin was transported to some other site in the body in our patient and some may have been excreted by the kidney. It is for this reason that several twenty-four hour specimens of urine were examined for protamine and for insulin, but neither was demonstrable in any of the specimens. The failure to liberate the insulin in our patient may have been due to the allergic reaction which altered the protamine and thereby prevented it from being broken down in the usual manner. The positive reaction to intradermal injections of protamine zinc insulin in our patient would support such a contention.

SCIATIC NERVE PRESSURE FOLLOWING RUPTURE AND FIBROSIS OF A HAMSTRING MUSCLE

P. M. GIRARD, M.D., DALLAS, TEXAS

AND

H. M. CHILDRESS, M.D., JAMESTOWN, N. Y.

This case is reported because no similar case could be found in the literature and because of the exceptional symptoms from a known condition, the failure of the usual surgical repair of a ruptured muscle to relieve symptoms and the excellent result from a final radical procedure.

REPORT OF CASE

A college student aged 21 sustained a traumatic injury to the distal posterior part of the left thigh in football practice in late October 1936. He was indefinite about the exact manner of his receiving the injury as he was beneath a pile-up of players. The traumatized area was treated with radiant heat and light massage for several days. He had pain on walking for the next few weeks but after that he had no trouble in the injured extremity until he entered spring football practice. At that time motions of the left knee seemed difficult to initiate and he had moderate weakness in the entire leg. Also a bulging mass developed in the midline of the posterior part of the thigh about 10 cm. above the superior boundary of the popliteal space. This tumor seemed to be of fibrous tissue, was moderately tender on pressure and was visible and palpable only when the knee was in flexion.

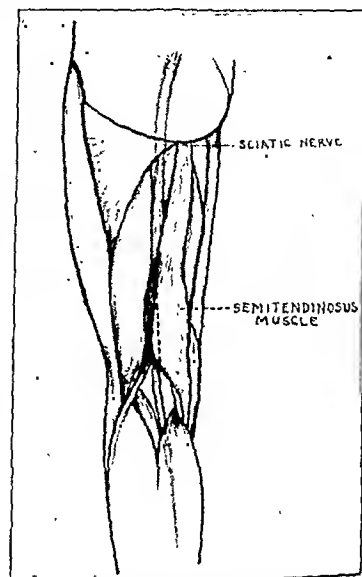
On examination a diagnosis was made of partial or complete rupture of a medial hamstring muscle with fibrosis due to continued use following injury. Through a longitudinal incision the hamstring muscles were exposed in the distal half of the thigh. The semitendinosus muscle was found to have an old partial rupture about 8 cm. above the musculotendinous junction. A mass of tissue, which appeared to be fibrous, filled the gap in the muscle. The tumor was excised, the muscle fibers were brought snugly together with No. 2 chromic interrupted sutures, and the wound was closed in layers. Motion was started at the knee in ten days and full activity was permitted at the end of four weeks.

The patient played football during the autumn of 1937 but was not able to handle the left extremity in a normal manner. He complained of weakness in the knee and inability to make sudden movements at this joint. Late in the season, while doing short practice sprints before a game, he felt a tearing sensation at the operative site. He had marked pain and was forced to walk with crutches for several weeks. He then discovered he had a small mass, moderately tender to pressure, in the lower posterior part of the thigh similar to the one present prior to the muscle repair.

In October 1938 he began work as a linesman with a telephone company. His duties included climbing and remaining on poles for long periods. At this time he began having unusual symptoms in the left leg. After being on a pole for twenty to thirty minutes he would develop a partial paralysis of the left ankle and anesthesia over the lateral and posterior portions of the leg and of the entire foot. When he returned to the ground both the motor and sensory disturbances would disappear immediately on his massaging the leg and passively moving the ankle. These symptoms of sciatic nerve pressure, he noticed, occurred only when the knee was kept in continuous hyperextension for periods longer than fifteen minutes.

He was examined again in late autumn. At that time a definite mass 6 by 4 by 1.5 cm. would appear in the midline of the distal posterior portion of the left thigh on flexion of the knee. There was but slight pressure tenderness. Results of neurologic examination were negative. No pathologic change of bone or joint was demonstrable by roentgenograms. It was believed that the motor and sensory changes of which the patient complained were due to localized fibrosis of the semitendinosus muscle which pressed on the sciatic nerve when the knee was in hyperextension. In such a position the tightened posterior fascia would force the mass laterally and anteriorly against the sciatic nerve. Surgical exploration was advised.

Exposure of the semitendinosus muscle showed a thickened muscle belly about 10 cm. proximal to the musculotendinous junction. The muscle appeared to be under normal tension but the fibers seemed coarser than normal. Since the patient had requested general anesthesia it was impossible to reproduce the exact swelling noted clinically. The tendon of the muscle was released at its insertion and the muscle was excised near its origin. The sciatic nerve was not explored. Motion was started at the knee in ten days and full unprotected activity allowed in six weeks.



Schematic drawing of the posterior part of the thigh, showing localized fibrosis of the semitendinosus muscle and its relation to the sciatic nerve.

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The specimen of tissue examined consisted of the semitendinosus muscle with the attached tendon. The lower third of the muscle, on section, was grayish white and increased in consistency. In some areas strands of firm fibrous tissue almost completely replaced the normal tissue.

Microscopic study showed a large amount of rather dense fibrous stroma which contained numerous small thin-walled blood vessels. In areas this fibrous tissue stroma was so diffuse that only small individual muscle fibers were seen. There was atrophy of the muscle fibers, shown by the loss of staining character, and there was slight breaking up of the nucleus with vacuolation of the cell cytoplasm.

The pathologic diagnosis was extensive fibrosis of the semitendinosus muscle caused by trauma.

The patient has been seen every two or three weeks and has had no recurrence of the nerve pressure symptoms. Motions at the knee are now unrestricted and painless, and the circumference of the left thigh measured 15 cm. above the patella is but 2.5 cm. less than that of the normal right thigh. The power of the left hamstring muscles is now (five months after operation) about 80 per cent normal. The patient walks without a limp and states that he is able to use the knee more efficiently than before the muscle resection.

COMMENT

Conwell and Allredge,¹ Gilcreest² and McMaster³ have made extensive studies on tears and ruptures of muscles and tendons. Gilcreest^{2c} reported rupture of the semitendinosus muscle of a man 59 years of age. This patient fell to the ground while lifting some heavy lumber and struck on his left thigh posteriorly. He had pain on standing with the knee extended and on active flexion of the knee, pain about the knee with each step and pain in the lower posterior part of the left thigh when the left leg was crossed over the right knee. At operation, with local anesthesia, a mass the size of a hen's egg was found. This was visible, however, only when the knee was actively flexed. The muscle was also in a relaxed condition. Mattress sutures were used to shorten the muscle. An excellent result was obtained.

The mechanism of a muscle's tearing is of interest. McMaster,³ in experimental work with ruptured muscles and tendons, concluded that muscles are most frequently ruptured by indirect violence when they are in a contracted state. The muscle belly is torn across or the musculotendinous junction is separated. He found that when a normal muscle with tendon attached is subjected to a severe strain the muscle is injured as just stated or the insertion of the tendon is pulled away. Lexer⁴ has pointed out that occasionally a muscle may be ruptured while in a resting state by indirect violence. Direct trauma may produce a rupture, as shown by Montgomery,⁵ who had a case in which the triceps was torn transversely owing to a severe blow on that muscle.

The muscle tissue changes following rupture are generally agreed on by pathologists. Boyd⁶ stated that a torn or injured muscle is repaired by fibrous tissue and that no new muscle fibers are formed. Blood is poured into the gap and union results from formation of fibrous tissue. Karsner⁷ expressed the belief that regeneration of muscle tissue depends on the extent of the injury and the degree of involvement of the perimysium. If the destruction is extensive the muscle buds cannot bridge the gap and the area is filled with scar tissue. Smith and Gault⁸ stated that striated muscle, to all intents and

purposes, is incapable of actual regeneration. When injury involves muscle cells there is an abortive attempt on the part of the sarcolemma to proliferate.

CONCLUSIONS

1. Fibrous tissue formation is inevitable in the repair of severe muscle tears, treated either conservatively or surgically.
2. The resulting fibrous mass should be given consideration in its relationship to adjacent nerves and vessels.
3. Further efforts to repair the muscle in this particular case would have undoubtedly produced additional scar tissue, with a recurrence of the nerve pressure symptoms.
4. An excellent end result, functionally and cosmetically, has been obtained by complete excision of the semitendinosus muscle.

3701 Maple Avenue—15 East Fourth Street.

Special Clinical Article

PHYSIOLOGY OF THE BILIARY TRACT

CLINICAL LECTURE AT ST. LOUIS SESSION

A. C. IVY, PH.D., M.D.

CHICAGO

AND

LEON GOLDMAN, M.D.

SAN FRANCISCO

The most common complaints for which patients seek medical aid are those referable to the digestive system. The biliary tract ranks high among the abdominal organs which give rise to these complaints. According to a recent report, 24.5 per cent of women and 9 per cent of men over 39 years of age who complain of "dyspepsia" have gallbladder disease.¹ Necropsy records reveal an incidence of gallstones varying from 6 to 32 per cent in the occidant; they also reveal an incidence of visible gallbladder disease varying from 50 to 66 per cent.² Thus, the frequency of gallbladder disease is such as to emphasize the importance of a clear understanding of the normal and applied physiology of the organ and the ducts with which it connects.

Since on previous occasions the physiology of the gallbladder and the sphincter of Oddi have been rather completely reviewed,³ this paper will deal chiefly with some of the more recent advances of practical import. (Space permits the citation of only a few references in this synoptic review.)

THE GENERAL FUNCTIONS OF THE GALLBLADDER

The evidence indicates that the gallbladder has two general functions: It serves as a pressure regulatory mechanism and as a bile reservoir for digestive purposes.⁴

Pressure Regulation.—In man and dog the secretory pressure of the liver amounts to approximately 30 cm.

From the Department of Physiology and Pharmacology, Northwestern University Medical School, Chicago.

Read in the Panel Discussion on Biliary Tract Disease, Surgical Division, General Scientific Meetings, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

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8. Smith, Laurence W., and Gault, Edwin S.: *Essentials of Pathology*, New York and London, D. Appleton-Century Company, Inc., 1938, p. 97.

of bile pressure. The maximum expulsive power of the gallbladder amounts to from 20 to 30 cm. The usual resistance offered by the "sphincter of Oddi" in man and dog amounts to from 9 to 25 cm., but the sphincter at times may offer as much resistance as 75 cm. of bile pressure. This is an important fact, since all animals that have a sphincter have a gallbladder apparently to prevent back pressure from being exerted on the liver.

Bile Storage.—All animals possessing a liver which forms relatively small quantities of bile, such as man, the dog and the cat, have a gallbladder which, by considerable concentration, from five to ten times, can store the twelve to twenty-four hour output of bile.⁵ This concentrated bile, rich in bile salts, is ready to be discharged in response to cholecystokinin, which is produced when fats and acids make contact with the intestinal mucosa.

CHOLECYSTECTOMY AND THE GENERAL FUNCTIONS

When a gallbladder that concentrates bile is removed, a temporary paresis of the sphincter is said to occur. Later the sphincter is thought to recover and to cause the dilatation of the ducts that is usually found in man

The only established effect of the removal of a gallbladder that concentrates bile is that dilatation of the ducts usually occurs.

THE ACTIVITIES OF THE GALLBLADDER

The activities of the gallbladder are absorption, secretion and motility. These have been discussed adequately in previous papers.¹⁰ A few points deserve reiteration. The acutely inflamed gallbladder does not visualize, concentrate or evacuate. After the acute inflammation subsides, the gallbladder may apparently function normally, subnormally or not at all. A noninflamed gallbladder with a hyperplastic mucosa concentrates exceedingly well. An inflamed gallbladder is capable of absorbing bile salts, and, at times, serum protein and even blood may exude into the lumen. Some of the changes in the activities of the organ occurring in several common disorders are outlined in the accompanying table.¹¹

FACTORS CAUSING OR PREDISPOSING TO GALLBLADDER STASIS

Stasis in the gallbladder will predispose to infection and to the formation of gallstones, which in time may

Gallbladder Bile (Human)¹¹

	Absorption	Concentration	Secretion	Visualization	Emptying	Bile Acids
Normal	Water Chlorides Sodium bicarbonate Bile salts (?) (small amounts) Cholesterol (?) (small amounts)	Bile salts Cholesterol Bile pigment Calcium	Mucus (nucleo-protein)	Present	Normal	50% cholic acid 50% noncholic acids
Pregnancy	.....	High cholesterol High chlorides Low bile salts Low calcium	Mucus	Present, distended	Delayed during 2d and 3d trimester	
Obstruction cystic duct	Eventually all constituents of bile absorbed	Calcium pigment high; cholesterol low calcium (when present)	± "White bile" (mucus) "Calcium milk bile"	Absent	Absent	
Damaged gallbladder wall (cholecystitis)	Bile salts; hypertrophic rugae cause good absorption, if not inflamed	High chloride Low bile salt Low calcium High protein	Increased	Present to faint, or absent	Normal, delayed, or absent	33% cholic acid in chronic cholecystitis; 10% cholic acid in acute cholecystitis

and dogs after surgical or pathologic cholecystectomy.⁶ Studies on man show that complete incompetence of the sphincter after cholecystectomy is not usual.⁷ However, a relative paresis may have occurred, since one cannot measure in man the resistance of the sphincter prior to cholecystectomy. Also the sphincter may have already undergone the sequence of paresis and recovery as a consequence of preexisting disease of the gallbladder. Although the actual cause of the dilatation to the ducts has not been established, the change shows that the gallbladder has a function. Further, bilirubinuria will develop sooner in an animal without a gallbladder than in one with a gallbladder when the common duct is obstructed.⁸ Direct evidence showing that intestinal digestion is disturbed after removal of a gallbladder that concentrates bile is wanting.⁹

cause symptoms. Continued stasis leads to hyperplasia of the mucosa and lymph nodes in the dog.¹² The following factors cause or predispose to gallbladder stasis: (a) hypertonicity of the sphincter of Oddi; (b) inflammation of the ampulla; (c) obstruction or stricture of the common duct; (d) duodenal inflammation;¹³ (e) reversed peristalsis or hypertonicity of the duodenum;¹⁴ (f) inadequacy of fats, proteins or fruit juices in the diet; (g) narrowing or inflammation of the cystic duct;¹⁵ (h) obstruction of the cystic duct; (i) hypo-

5. Schmidt, C. R., and Ivy, A. C.: The General Functions of the Gallbladder: Do Species Lacking a Gallbladder Possess Its Functional Equivalent? *J. Cell. & Comp. Physiol.* **10**: 363 (Oct.) 1937.

6. Bergh, G. S.; Sandblom, Philip, and Ivy, A. C.: Effects of Removal of the Functioning Gallbladder, *Surg., Gynec. & Obst.* **62**: 811 (May) 1936.

7. Best, R. R., and Hicken, N. F.: Biliary Dyssynergia: Physiological Obstruction of the Common Bile Duct, *Surg., Gynec. & Obst.* **61**: 721 (Dec.) 1935. Bergh, G. S.: The Common Bile Duct, *Staff Meet. Bull. Hosp. Univ. Minnesota* **10**: 73, 1938. Walters, W. L.; McGowan, J. M.; Butsch, W. L., and Knepper, P. A.: The Pathologic Physiology of the Common Bile Duct, *J. A. M. A.* **109**: 1591 (Nov. 13) 1937.

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9. Atkinson, A. J., and Ivy, A. C.: Does Removal of a Functioning Gallbladder Affect the Metabolism of Lipids? *J. Lab. & Clin. Med.* **22**: 441 (Feb.) 1938.

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11. Potter, M. G.: Observations of the Gallbladder and Bile During Pregnancy, *J. A. M. A.* **106**: 1070 (March 28) 1936. Riegel, Cecilia; Ravdin, I. S.; Morrison, P. R., and Potter, M. G.: Gallbladder Bile in Pregnancy, *J. A. M. A.* **105**: 1343 (Oct. 26) 1935. Phenister, D. B.; Aronsahn, H. G., and Pepinsky, Raymond: Variation in the Gall-Bile Pigment and Calcium Salts Content of Gallstones Formed in the Gallbladder and in the Bile Ducts with a Degree of Associated Obstruction, *Ann. Surg.* **109**: 161 (Feb.) 1939. Riegel, Cecilia; Ravdin, I. S.; Johnston, C. G., and Morrison, P. J.: The Composition of Gallbladder Bile and Calculi in Gallbladder Disease, *Surg., Gynec. & Obst.* **62**: 933 (June) 1936. Colp, Ralph, and Doubilet, Henry: Differential Diagnosis of Bile Acids in Human Gallbladder Bile, *Arch. Surg.* **33**: 913 (Dec.) 1936. Gerdes and Boyden.¹²

12. Walsh, E. L.: Etiology of Gallstones, *Arch. Path.* **15**: 698 (May) 1933.

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14. Shapiro, P. F., and Kasabach, H. H.: Effect of Chronic Duodenal Obstruction on Evacuation of the Gallbladder, *Arch. Surg.* **26**: 1034 (June) 1933.

15. Cole, W. H.: Noncalculous Cholecystitis, *Surgery* **3**: 824 (June) 1938.

tonicity of the gallbladder; (j) inflammation, fibrosis or obstruction of the gallbladder; (k) pregnancy.¹⁶

REFLEX EFFECTS OF GALLBLADDER OR BILE DUCT DISTENTION

Pain, nausea and vomiting are well known reflex symptoms in biliary colic. Inspiratory distress is reported in 25.5 per cent of patients with chronic cholecystitis and in 31.8 per cent when associated with jaundice.¹⁷ Impaction of a stone in the cystic duct is said to be especially prone to cause respiratory distress. It is now known that a rather sudden elevation of pressure in the gallbladder or ducts will cause pain, nausea and vomiting in man and the dog. The right half of the diaphragm is relatively fixed and shows a limitation of motion. The pain is abolished by section of the splanchnic nerves and the nausea and vomiting by section of the vagi.¹⁸ To abolish completely the associated respiratory disturbance, section of both splanchnics and vagi is required. Anorexia may occur in disease of the biliary tract. It is known that mild distention of the biliary tract will inhibit hunger contractions and diminish the tone of the stomach, which probably accounts for the anorexia.¹⁹ Further, distention causes pylorospasm and contractions of the pyloric antrum if nausea or vomiting occurs.²⁰ The gastric flatulence of biliary tract disease is probably not due to fermentation or to the passage of gas from the blood into the stomach, although this idea has not been disproved, particularly in those patients who have anacidity. However, it has been found that appropriate distention of the gallbladder—a distention that causes loss of gastric tone but no evident nausea—may cause "aspiration" of air into the stomach owing to an apparent relaxation of the stomach and abdominal muscles.²⁰ (This phenomenon is not easy to demonstrate. One of us has seen this occur a number of times in lightly anesthetized dogs with the abdomen open while the stomach was visibly relaxing and becoming atonic.) Changes in heart rate, extrasystoles and arrhythmia may be induced by distention of the biliary tract in the dog, which may explain the improvement in cardiac rhythm reported to occur after cholecystectomy in some patients.²¹ An analysis of the theories of referred pain indicates that pseudo-angina or cardiac pain with distress in the biliary tract or vice versa means that disease is present in both the coronaries and the biliary tract. The effect of distention of the biliary tract on the small and large intestine, according to our knowledge, has not been studied.

SPHINCTER OF ODDI

In recent years considerable knowledge regarding the sphincter of Oddi in man has been contributed.⁹ Its only clearly demonstrated function is that it is necessary for the filling of the gallbladder. Schwegler and Boyden's²² embryologic and anatomic study has clearly

established its independent development and has shown that a definite group of circular fibers, called the sphincter choledochus, invests the ampulla and common duct distal and proximal to their junction. Using intact subjects or patients with an intubated cystic or common duct, important contributions to the physiology and pharmacology of the sphincter or the resistance to the flow of bile into the duodenum have been made. Biliary colic has been produced in the intact biliary tract by causing the gallbladder to contract in the presence of a spastic sphincter. Magnesium sulfate instilled into the duodenum relaxed the sphincter and relieved the colic.²³ With the common duct intubated, the following observations have been made: (a) After recovery from the operation, the average sphincteric resistance is 15 cm. of water (from 9 to 25 cm.) pressure. (b) In patients with inflammatory lesions, such as cholangitis secondary to stone, it is not uncommon for the sphincter to remain irritable for several weeks²⁴ and the resistance to fluctuate from 30 to 50 cm. or higher. (c) A carbohydrate meal has no significant effect on the sphincter, but a fatty meal decreases resistance.²⁵ (d) Morphine, pantopon (hydrochlorides of the alkaloids of opium, principally morphine), dilaudid and codeine increase resistance and amyl nitrite, glyceryl trinitrate, theophylline and magnesium

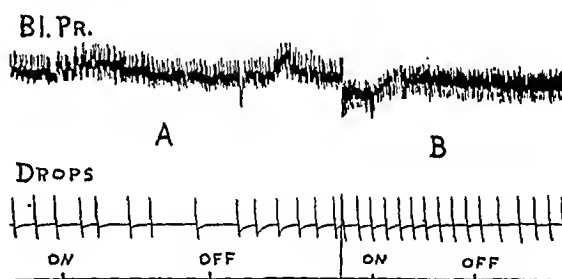


Fig. 1.—Effect of distention of the colon (A) before and (B) after section of the hepatic nerves on bile formation.

sulfate decrease resistance.⁷ (e) In the presence of a spastic sphincter, distention of the duct (from 15 to 20 cm. of water) causes the biliary colic type of pain.²⁶ Thus, the basis of the concept of biliary dyskinesia has been clearly and adequately demonstrated experimentally in man.

What causes a sphincter to become hypertonic, spastic or irritable is another question. Inflammation of the ampulla could do so by rendering the muscle hyperirritable; but, strictly speaking, this would not be a functional disturbance. Hypertrophy of the sphincteric muscle has been demonstrated,²⁷ but the cause of the hypertrophy is unknown. Reflex causes have been postulated but not proved. Inflammation or an irritable duodenum might involve the sphincter directly or indirectly.

Can the sphincter of Oddi be caused to contract reflexly? This is obviously an important question. The question has particularly intrigued us because com-

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18. Schragar, V. L., and Ivy, A. C.: Symptoms Produced by Distention of the Gallbladder and Biliary Ducts, Surg., Gynec. & Obst. **47**: 1 (July) 1928.
19. Brush, B. E., and Patterson, T. L.: The Influence of Gallbladder on Gastric Hunger Motility in the Dog, Proc. Am. Physiol. Soc. Meet., April 1939, to be
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22. Schwegler, R. A., and Boyden, E. A.: Development of Pars Intestinalis of Common Bile Duct in Human Fetus with Special Reference to Origin of Ampulla of Vater and Sphincter of Oddi, Anat. Rec. **68**: 17 (April), 192 (May) 1937. Boyden, E. A.: Sphincter of Oddi in Man and Certain Representative Animals, Surgery **1**: 25 (Jan.) 1937.

23. Meltzer, S. J.: Diseases of the Bile Ducts and Gallbladder, Am. J. M. Sc. **153**: 469
B. V.: Diagnosis and Treatment of Disease of Ducts, J. A. M. A. **73**: 980 (Sept. 27) 1919.
24. Doubilet, Henry, and Colp, Ralph: Resistance of the Sphincter of Oddi in the Human, Surg., Gynec. & Obst. **64**: 622 (March) 1937. Bergh.⁷
25. Boyden, E. A.: A Study of the Behavior of the Human Gallbladder in Response to the Ingestion of Food, Anat. Rec. **33**: 201, 1926. Ivy.¹⁹ Bergh.⁷
26. Ivy, A. C., and Sandblom, Philip: Biliary Dyskinesia, Ann. Int. Med. **8**: 115 (Aug.) 1934. Best and Hicken.⁷ Bergh.⁷ Walters, McGowan, Butsch and Knepfer.⁷
27. Giordano, A. S., and Mann, F. S.: The Sphincter of the Choledochus, Arch. Path. **4**: 943 (Dec.) 1927.

plaints of constipation and biliary tract disorders are so frequently associated and because constipation and biliary tract disease are prone to develop in pregnancy.

For example, with regard to pregnancy, it is reported clinically that from 70 to 90 per cent of women who have gallbladder disease necessitating operation are mothers.²⁸ Delayed evacuation in the latter part of pregnancy has been observed in man and animals.²⁹ Potter and others³¹ have found that the bile in the

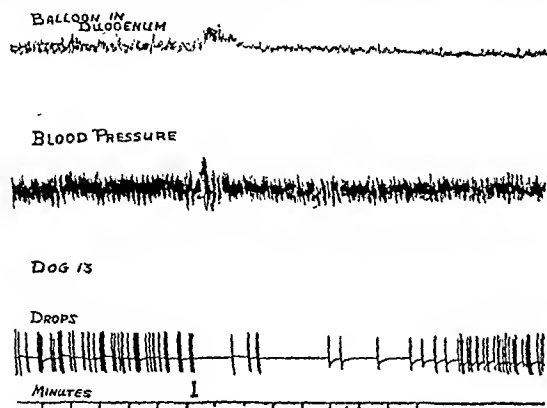


Fig. 2.—Effect of stimulation of the inferior mesenteric plexus at 1 on the resistance to the flow of bile through the sphincter of Oddi into the duodenum. Note that stimulation of the plexus caused a temporary contraction of the duodenum and a more prolonged increase in the resistance to the flow into the duodenum.

gallbladder late in pregnancy is chemically altered. This is brought out in the accompanying table. The occurrence of constipation during pregnancy is well known. Blalock³⁰ has reported constipation as a symptom in 62 per cent of 735 patients in whom gallbladder disease was proved by operation. The incidence of cholecystopathy is doubled in persons with diverticulosis of the colon³¹ and in patients with peptic ulcer and recurring appendicitis.³² Many other clinical reports indicate the possible existence of a causal relationship between abnormal functioning in the alimentary tract, particularly the colon, and cholecystopathy. This possibility is emphasized by the observation of Boyden and Birch³³ that faradic stimulation of the peritoneal surface of the duodenum, jejunum and cecum in animals caused an enlargement or relaxation of the gallbladder.

The retarded evacuation of the gallbladder during pregnancy might be due to (a) very thick bile due to reflex inhibition of bile secretion, (b) reflex hypertonus of the sphincter and duodenum, (c) reflex inhibition of the gallbladder, (d) the action of sex hormones on the gallbladder or (e) a metabolic change in the chemistry of the bile. Constipation might predispose to cholecystopathy by the same mechanisms except that of the sex hormones. We have to date tested only two of these possibilities, namely, a and b.

EXPERIMENTAL

The Effect of Distention or Stimulation of the Colon on Bile Secretion.—Dogs were anesthetized and the bile duct was cannulated for the collection of bile; the cystic

duct was tied. The flow of bile was recorded electrically. The colon was distended with water or its nerves were stimulated electrically.

In twelve of fourteen dogs, distention of the colon with water reduced the secretion of bile by 50 per cent (fig. 1). Stimulation of the central end of the colonic, inferior mesenteric or superior mesenteric nerves of sixteen dogs caused a similar inhibition of bile secretion. Section of the hepatic nerves prevented the inhibition of secretion. This proves that the decrease in secretion was reflex in nature. When the bile flow was brisk after an injection of bile salts, the secretion was more difficult or impossible to inhibit. Distention of the proximal colon appears to be more effective than distention of the distal colon in eliciting the inhibition.

The Effect of Stimulation of the Colonic Nerves on the Sphincter of Oddi and the Duodenum.—The method of recording changes in the resistance of the sphincter and in the tone of the duodenum used previously in our laboratory was employed.³⁴ In brief, it consists in raising the pressure in the bile duct until a flow into the duodenum is established; then the colon is stimulated and the flow ceases. Then the pressure in the bile duct is raised until the flow appears. Simultaneous records of duodenal motility are made with a balloon.

In 90 per cent of the experiments, which were repeated several times in thirteen animals, stimulation of the nerves of the colon or inferior mesenteric plexus caused an increase in resistance of the choledochoduodenal mechanism (fig. 2). In 75 per cent the duodenal motility was increased and was associated with an increase in the resistance to the flow of saline solution into the duodenum. In most of the tests the increase in resistance outlasted the duration of the stimulation and in half of the tests the increase in resistance outlasted the increase in duodenal tone. The increase in resistance varied from 5 to 21 cm. of saline solution pressure (fig. 3).

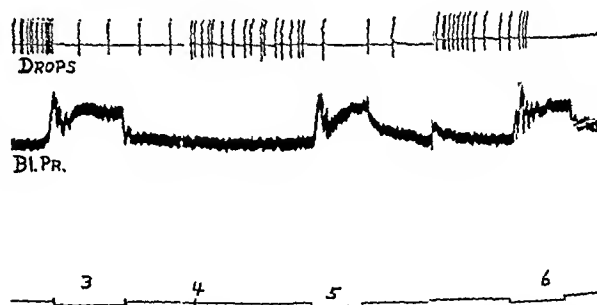


Fig. 3.—Effect of stimulation of the colonic nerve on the resistance to the flow of bile into the duodenum. At 3, the nerve was stimulated. At 4, fifteen minutes later, the pressure in the common duct had to be elevated 12 cm. of pressure to obtain a return of flow. At 5, the nerve was stimulated again and the pressure had to be elevated 9 cm. more to reestablish a flow. At 6, the nerve was stimulated again. Thus, two stimulations of the colonic nerve increased the resistance from an original of 23 cm. to 54 cm., an increase of 21 cm.

COMMENT

The results of these experiments provide two mechanisms by which constipation may promote gallbladder or biliary tract stasis. Although they tend to confirm clinical impressions and observations, they cannot be directly applied to man. They are sufficiently decisive and important to indicate prophylactic therapy and to stimulate research to ascertain whether such mechanisms actually operate in man. There is no a priori reason to doubt their existence in man.

28. Huggins, R. R.; Harden, Boyd, and Grier, G. W.: A Study of the Relationship of Pregnancy to Disease of the Gallbladder, *Surg., Gynec. & Obst.* 61: 471 (Oct.) 1935.

29. Mann, F. C., and Higgins, G. M.: Effect of Pregnancy on Emptying of Gallbladder, *Arch. Surg.* 15: 552 (Oct.) 1927. Gerdes and Boyden.¹⁹

30. Blalock, A. A.: Clinical Study of Biliary Tract Disease, *J. A. M. A.* 82: 2057 (Dec. 27) 1924.

31. Kocour, E. J.: Diverticulosis of Colon, *Am. J. Surg.* 37: 433 (Sept.) 1937.

32. Good, C. A., and Kirklin, B. R.: Influence of Extrabiliary Disease on Functions of the Gallbladder, *Am. J. Roentgenol.* 37: 346 (March) 1937.

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SUMMARY

Experimental results show that constipation or irritation of the colon or stimulation of the various divisions of the splanchnic nerves may predispose to stasis of the biliary tract by decreasing bile formation and by increasing the resistance to the flow of bile through the sphincter of Oddi into the duodenum.

303 East Chicago Avenue—University of California Hospital.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

MERIT SHORT WAVE DIATHERMY NOT ACCEPTABLE

Manufacturer: Merit Health Appliance Company, 1301-1303 South Lorena Street, Los Angeles.

An apparatus brought to the attention of the Council recently in behalf of public welfare is the Merit Short Wave Diathermy Unit. The Council concludes from an advertising folder called "Now! Short Wave Diathermy in Your Home . . . Relief Without Drugs" and from a letter addressed to a dealer that the unit is sold directly to the public for self treatment of disease. To quote, "ADVANTAGES OF HOME TREATMENT. . . . There when you need it—The old axiom 'an ounce of prevention,' etc., holds true today. Therein lies one of the chief advantages of having MERIT SHORT WAVE DIATHERMY in your home right when you need it. When the ailment is in its initial stages it is there ready to use and its application may prevent further progress of the disease. MERIT SHORT WAVE DIATHERMY can be used by every member of the family."

According to the advertisement, the device is portable and includes two pad electrodes as accessories, with sinus applicators available. According to the letter to a dealer, the apparatus utilizes two vacuum tubes of the T40 type. The manufacturer states that the maximum output for the unit is rated at 100 watts, and that the input for an average treatment is 225 watts. It operates on 110 volt 50 or 60 cycle alternating current.

Among the objectionable features that have been noted in the advertising is that the device is advocated for the effective treatment of many diseases for which the use of diathermy has not been substantiated, the treatment apparently to be self prescribed and administered by laymen. Among the ailments suggested for treatment are common colds, bronchial asthma and bronchitis, aching feet, sinus infection, "ailments common to women," high blood pressure, "agonizing pain" and "many stubborn diseases." It is stated that the unit is easy to use and that it "is so simple that even a child can operate it." Other objectionable statements in the advertising and letter include ". . . the old methods of application (of heat) are ineffective, uncertain and uncomfortable," "Short Wave Diathermy . . . countless thousands of sufferers have found it to be one of the safest, pleasantest, and most effective methods of treatment ever discovered." "It is similar to and as effective as the larger sets used by physicians, but is especially designed and simplified for home use." The firm suggests that diathermy be used for the destruction of bacteria, but no evidence is available that such an apparatus as this will cause bacterial destruction in the human body.

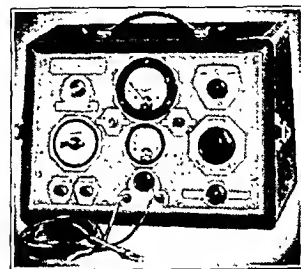
In the opinion of the Council, the Merit Health Appliance Company appears to be promoting an instrument in a way that is detrimental to public interest and to rational therapeutics. Sales methods which promote self treatment of disease by those unqualified to practice medicine and appeal to the public with unscientific persuasions may harmfully enhance a feeling of false security on the part of the public.

In view of the foregoing report, the Council on Physical Therapy voted not to accept the Merit Short Wave Diathermy Unit for inclusion in the Council's list of accepted devices.

BURDICK IONOPHORE ACCEPTABLE

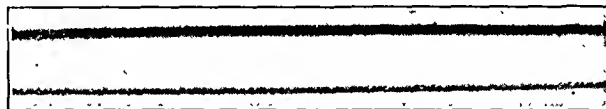
Manufacturer: The Burdick Corporation, Milton, Wis.

The Burdick Ionophore generates galvanic current designed for use in iontophoresis, muscle stimulation and medical electrolysis (removal of hair). It is a portable unit with a front cover which is removable in order to expose the dials. Standard accessories include negative and positive patient cords, line cord, 2 foot cords with bulldog clips, one 6 by 8 inch Morse surface electrode and electrode material for iontophoresis. It weighs 26½ pounds and its dimensions are 10 by 11 by 14½ inches.

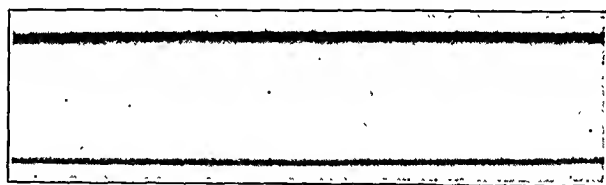


Burdick Ionophore.

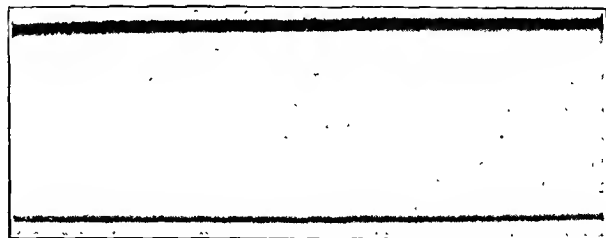
The unit is equipped with two valve rectification and an extra capacity filter. The firm claims that it generates ample, smooth electric current, which, in order to prevent pain and electric shocks, is automatically built up slowly at the turning on of the power and gradually decreased to zero at the termination of the treatment. One voltage control is adjustable for "low, medium and high" and a milliamperage control is adjustable to the given ranges of voltage up to 60 milliamperes. A pilot light indicates when the desired intensity of current is reached and glows throughout the treatment; an automatic timer shuts off the current at the designated time. The resistance of



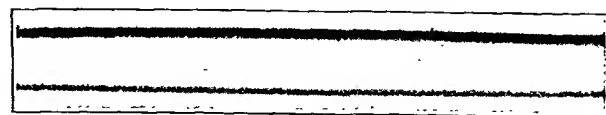
1. Oscillogram. Load 1,500 ohm resistance. Current 20 milliamperes.



2. Oscillogram. Load 1,500 ohm resistance. Current 40 milliamperes.



3. Oscillogram. Load 1,500 ohm resistance. Current 60 milliamperes.



4. Oscillogram. Load 3,000 ohm resistance. Current 20 milliamperes.

the patient's circuit, an index of the efficiency of the electric contacts, is measured by a resistance meter operating through an independent circuit. The polarity of the electrodes may be reversed by a control on the panel, eliminating the need of reversing the leads during a treatment. Models are available for operating on 110 volt 60 cycle alternating current or 110 volt direct current.

The Council investigated the electrical characteristics of the Ionophore by a string oscilloscope and obtained tracings of the current output on photographic films. The oscillograms were made with a stationary film since the output was continuous. The second element of the oscillograph was held at the center of the film to provide a guide line for comparison.

These oscillograms were made under the following conditions: Numbers 1, 2 and 3 were made with a load resistance of 1,500 ohms but the output currents were 20, 40 and 60 milliamperes respectively. Number 4 was made with a 3,000 ohm load and an output current of 20 milliamperes.

This direct current was filtered through a condenser to eliminate the direct current component and no ripple was apparent.

The resistance meter found on this machine is a standard type much used in making resistance measurements. As such, it performs within acceptable limits of accuracy. It has no effect on the other functions of the machine. In establishing the external circuit for this unit, many variables would be encountered, such as moisture in the skin and in the electrodes, area of the path, the current traveled and the chemical substances at the points of contact of the electrodes. With this meter such variables can be integrated into a single value in ohms.

The unit was submitted to a qualified physician for clinical trial and investigation, and he reported that it gave satisfactory service.

In view of the foregoing report the Council on Physical Therapy voted to accept the Burdick Ionophore for inclusion in the Council's list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

PAUL NICHOLAS LEECH, Secretary.

ASSAY STANDARDS FOR CHORIONIC GONADOTROPIN

Accuracy in therapy with chorionic gonadotropin preparations has been seriously affected through the use of standards based on biologic reactions, the activity of such preparations being generally stated in terms of rat units. The rat units of the various firms marketing chorionic gonadotropin differ, however, to a varying extent. Some firms employ an assay method based on a minimal ovarian response in the immature rat, others use the induction of an estrous vaginal smear as the end point of their assay. According to impartial sources¹ there may be 100 per cent or more variation in assays by these two methods. Furthermore, there is a significant difference when even the same methods are used by different laboratories. Thus, administration of such material labeled in rat units leads to improper and unscientific dosage.

In an effort to avoid the confusion associated with bio-assays, the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations has devised and adopted an international standard of chorionic gonadotropin. This international standard is described in the memorandum of the League of Nations Health Organization which is appended to this report.

As the adoption of such a standard in this country would contribute to more reliable therapy, it appeared desirable that the Council consider for adoption a similar standard. In preparation for the Council's possible action the Advisory Committee on the Nomenclature of Endocrine Principles was consulted by questionnaire. The replies from the members of this committee were practically unanimous in recognizing the need for a suitable standard and in approving the international standard as adopted by the League of Nations Commission.

1. D'Amour, F. E., and D'Amour, M. C.: *Potency of Certain Commercial Hormone Preparations*, *Endocrinology* 22: 583 (May) 1933. Gaensbauer, Ferdinand, and Bradbury, J. T.: *Comparative Potency of Commercial Anterior Pituitary-like Preparations*, *ibid.* 24: 867 (June) 1939.

The Council therefore voted that the international standard for chorionic gonadotropin as devised by the League of Nations Health Organization be adopted by the Council and that firms whose preparations of this substance are considered for acceptance be required to assay the activity of their material according to this standard and label such activity in international units.

The international standard for the gonadotropic substance of human urine of pregnancy, chorionic gonadotropin, is appended.

LEAGUE OF NATIONS HEALTH ORGANIZATION MEMORANDUM

INTRODUCTION

During 1937 and 1938 an inquiry was made among interested workers as to the practicability and desirability of establishing an International Standard for the gonadotropic substance of human urine of pregnancy. It was recalled that preparations of this substance were standardized in a great variety of ways and that there was no method of equating the various types of units, defined in terms of animal reactions, used by different workers and manufacturing organizations. The survey showed that there was complete unanimity as to the desirability of establishing a standard, and the offers of material received from various quarters made it evident that there would be no practical difficulty in constituting a standard preparation in adequate quantity to serve world requirements.

At the third International Conference on the Standardization of Hormones, held in Geneva in August 1938 under the auspices of the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations, the results of the preliminary survey were considered and it was unanimously decided to arrange for the establishment of an International Standard for the gonadotropic substance of human urine of pregnancy.

The conference had before it the results of a cooperative examination of the various contributions offered toward the proposed standard, and they were able to formulate details of the manner in which the contributions should be mixed. They also defined a unit of activity in terms of the proposed mixture, subject to confirmation after specimens of the mixture had been assayed by members of the conference.

The contributions were subsequently mixed as arranged and a specimen approved by each member of the conference. The standard was established, and the unit brought into current use on April 1, 1939.

PREPARATION AND FORM OF ISSUE OF THE INTERNATIONAL STANDARD

Contributions from six sources were used in preparing the standard, substantial amounts of material approved by the conference having been generously provided by each of the following:

Boots Pure Drug Co., Ltd., Nottingham, England.
I. G. Farbenindustrie Aktiengesellschaft, Elberfeld, Germany.
Løvens Kemiske Fabrik, Copenhagen, Denmark.
N. V. Organon, Oss, Netherlands.
Parke, Davis & Company, Detroit.
E. R. Squibb & Sons, New Brunswick, N. J.

Several of these preparations were already largely diluted with lactose and, as a first step in the mixing of the contributions, those preparations not already so treated were diluted to an activity equal to that of the most active diluted preparation by the addition of an appropriate amount of lactose.² At this stage a bulk of material amounting to about 800 Gm. was obtained. The material was then dried by exposure to P₂O₅ in vacuo and made into tablets of approximately 10 mg. without the addition of further excipient. A test weighing of tablets showed that 86 per cent were within ± 5 per cent of the 10 mg. aimed at.

The tablets were then packed in lots of twenty-five in small amber tubes, which were plugged with cotton wool and placed in ampules. The ampules were evacuated, filled with pure, dry nitrogen and sealed. A cork to fit the inside amber tube was

2. The whole of the contributions were then carefully mixed and further diluted with an equal amount of lactose.

also enclosed in each ampule. This method of double packing was devised to ensure the exclusion of oxygen from the finally sealed ampule, as laid down in the Report of the Conference, and at the same time to provide a suitable container for the tablets after the ampule had been opened and discarded. The finished ampules were transferred to the cold-room and are maintained constantly at a temperature of -2°C ; 2,854 of these ampules, each containing twenty-five 10 mg. tablets, were prepared. The standard is kept by the Department of Biological Standards, National Institute for Medical Research, London, N.W. 3.

The whole of the mixing, compressing and packing of the standard was generously carried out by Burroughs Wellcome & Company as a contribution toward the work.

DEFINITION OF THE UNIT

The definition of the unit adopted by the third International Conference is as follows:

The specific gonadotropic activity of 0.1 mg. (= 100 gamma) of the standard preparation shall be the international unit for recording the activities of all gonadotropic preparations of human urine of pregnancy, but only of such.

The unit so defined is an amount of activity very similar to that required, under the conditions used by many workers, to cause cornification of the vaginal epithelium of the immature rat.

SUGGESTIONS FOR USE

After the ampule has been opened, the inner tube should be removed, freed from cotton wool and closed with the cork provided. One or more tablets, each of which contains about 100 units, should be removed as required. The tablets are as constant in size as is practically possible, but it is essential that they should be weighed before use, so that a solution can be made of an exactly known strength, on the basis of 10 units for each milligram of ascertained weight. The tablets dissolve very readily in water or saline solution.

After the ampule has been opened, the amber tube containing the tablets of the standard preparations should be kept in a small desiccator containing P_2O_5 .

USE OF STANDARD IN BIOLOGIC ASSAY

The following recommendations for use of the standard are taken from the Report of the Conference, Bulletin of the Health Organisation of the League of Nations 7:889, 1938.

"The only tests for the comparative determination of gonadotropic activity, in units as above defined, on which the Conference has evidence to justify recommendation, depend on:

(a) The observation of a direct or indirect gonadotropic effect, shown by morphological changes in the gonads;

(b) The observation of secondary changes in the accessory reproductive organs, in animals not deprived of their gonads. When this type of test is used, the absence of substances directly causing such changes in the accessory reproductive organs should be assured by control tests on animals deprived of their gonads."

GLYCOLIXIR NOT ACCEPTABLE FOR N. N. R.

The number of inquiries which are received by the Council on Pharmacy and Chemistry concerning Glycolixir (E. R. Squibb & Sons) indicates the desirability of the publication of a report on the status of this preparation.

Glycolixir (Elixir Glycocolli Squibb) is the trade name for a preparation manufactured by E. R. Squibb & Sons, New York, which is stated to be a "tonic elixir" developed for use in patients "lacking considerably in energy," for whom a drastic regimen is unnecessary or unsuited. It is said to contain 28 grains of aminoacetic acid (glycocolli) per tablespoonful ($\frac{1}{2}$ fluidounce), indicated on the label as the average adult dosage. This represents approximately 1.8 Gm. of aminoacetic acid (glycocolli) in 15 cc. of the mixture. The vehicle is stated to consist of a "specially blended base of fine wine." The label also declares the presence of ethyl alcohol (12 per cent by volume).

The rationale of using such a preparation as a "tonic" on the basis of its aminoacetic acid content may be questioned. Several brands of aminoacetic acid N. N. R. stand accepted on the basis

of the reported effectiveness of these preparations in myasthenia gravis, progressive muscular dystrophy and pseudohypertrophic muscular dystrophy. There is no satisfactory evidence to warrant recommendations for use of the substance in combating fatigue such as might be encountered in patients for whom a "tonic" may be considered desirable. There is likewise no suitable evidence in support of the claims for the value of aminoacetic acid in stimulating appetite.

In a recent report (THE JOURNAL, July 8, 1939, p. 127) the Council on Foods has discussed available evidence in support of the claim that increased muscular endurance and delay in fatigue follow the ingestion by healthy men of gelatin, a protein which contains about 25 per cent of aminoacetic acid. In the opinion of the Council on Foods the available evidence does not justify the claims made.

In Squibb and Sons' advertising pamphlet "Glycolixir," on page five, there appears a quotation taken from the *Proceedings of Staff Meetings of the Mayo Clinic*, attributed to Dr. Russell M. Wilder:¹

"I am satisfied that I have been capable of more sustained effort since taking glycine, and other healthy subjects will tell the same story."

In a recent communication to the headquarters of the American Medical Association, Dr. Wilder has stated that the quotation was made without his permission. He further stated that the omission of the clause with which the original sentence ended completely changed its significance. The clause ending the sentence is quoted from his letter as follows: "but testimonial evidence such as this will not satisfy the critical mind." Dr. Wilder also indicated that the experiment on himself demonstrating a reduction of the output of creatine during exercise following the use of glycine was inadequate evidence of the effectiveness of this drug in muscle fatigue. He stated that it represented "an illustration of the kind of evidence which would need to be accumulated before conclusions could be drawn."

Despite the lack of suitable basis for its claims, the firm suggests the use of the product for the treatment of children who are underweight. Two dosage forms are available: The "Elixir," already described, and "Tablets," containing 1.0 Gm. of aminoacetic acid. The tablet form is claimed to be useful whenever the alcohol in the elixir is undesirable. The average dosage for both children and adults is stated on the bottle label of the "elixir." While this in itself is not objectionable, it is obvious that it suggests the usefulness of the elixir in children for the purpose of combating loss of weight, appetite or endurance. In the opinion of the Council this claim is unwarranted not only on the basis of insufficient clinical evidence but also because it may encourage the use of alcohol medication in children, or in adults suffering from muscular dystrophy. In either case the use of alcohol is contrary to the best modern therapeutic practice. If only the tablet form of Glycolixir was intended for such uses, no reference to dosage for children should appear on the label of the "elixir." It would seem, however, that the recommended adult dosage of two tablets three times daily could not be expected to be effective for such use as is recognized by the Council for aminoacetic acid, N. N. R., wherein from 20 to 30 Gm. is the recommended daily dosage. For this dosage the tablet form of Glycolixir would necessitate administration of from twenty to thirty tablets daily. It is apparent, therefore, that Glycolixir in both forms is intended for use as a "tonic," for which purpose the Council objected on the grounds of unwarranted therapeutic claims.

The Council declared "Glycolixir" unacceptable for inclusion in New and Nonofficial Remedies because (a) there is inadequate evidence to establish the claims made for the efficacy of its active ingredient, aminoacetic acid (glycocolli, glycine), in conditions other than various muscular dystrophies, (b) its alcoholic content is undesirable as a component of medication intended for children, (c) it is promoted in part by misquotation of references in advertising which is misleading, and (d) it is marketed under a proprietary name with unwarranted therapeutic claims in a manner which is inimical to the best interests of the public and the medical profession.

1. Wilder, R. M.: General Discussion, Proc. Staff Meet., Mayo Clin. 9: 606 (Oct. 3) 1934.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 30, 1939

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PRESIDENT GIVES INTERVIEW ON HEALTH PLANS

On December 22 President Franklin D. Roosevelt, in his regular interview with the press, gave definite intimation as to his point of view relative to proposed legislation in the field of health. According to a report from the United Press, he said that the administration is considering a program for federal construction of hospitals in areas where such facilities are lacking, and he intimated that the plan might be recommended to the coming Congress. According to the United Press, he said the program, if undertaken, would start modestly but could be enlarged as desired. No estimate of the cost has been completed, but the President emphasized, says the report, that it would cost less than the more extensive health and school programs proposed in bills introduced by Senators Robert F. Wagner, of New York, and Pat Harrison, of Mississippi.

According to the United Press, his comments indicated that he is dissatisfied with both these measures.

He said that the Wagner or Harrison bills would cost a lot of money and that the chief trouble was in the requirements for states to match federal funds. The new program he outlined would provide that the government bear 100 per cent of the hospital construction costs, retain title to the institutions and build them only in areas where local interests offered satisfactory assurances that they would operate and maintain the institutions.

Under a matched program, Mr. Roosevelt is said to have pointed out, those states which have the most money could obtain the most federal funds. "They already have the best hospitals and health conditions, he pointed out," says the United Press report, "while the poorer states have a lower health level and insufficient funds to obtain federal money on a matched basis. Since elimination of the PWA 55-45 matched money program, the President said, the federal government could afford to finance in a small way medical centers in those areas needing them. He suggested fifty hospitals as a start. He pointed out as an example one New York county of 100,000 population with six good hospitals and three Southern counties of the same population without any medical facilities. The cost of the program he has envisioned would not be great, but it would mark the first experimental steps to bring health facilities to those areas needing them most, he explained. The major part of the work would be done by the WPA as far as possible, he said. The Public Health Service and a committee of doctors would pass on the plans and determine the ability and willingness of localities to operate and maintain the institutions. The President said he had talked over the plan with a number of doctors and will discuss it soon with the American Medical Association.

"He said doctors from many locales had told him they were unable to raise capital to build hospitals but that if they could get small plants they could maintain and operate them. As outlined by the President, each institution would consist of a one story hospital building of two wings, one each for white and colored persons, and an administration building with clinic, operating room and laboratory. He estimated that each hospital would provide 100 beds at a cost of around \$150,000. The President emphasized that his program is no grandiose scheme for putting up hospital centers costing \$10,000,000 each and said he did not think the medical association's objections to government health programs would apply to such small hospitals. The President said that Miss Josephine Roche, former Assistant Secretary of the Treasury, was remaining with his Interdepartmental Committee on Health, but he said it did not mean that Security Administrator Paul V. McNutt was being eased out of the health program. He said a story to that effect about McNutt was crazy and made out of whole cloth."

Thus the President has recognized some of the objectives of the platform of the American Medical Association.

tion. He has recognized the primary objection inherent in the principle of grants-in-aid. The American Medical Association has approved the development of medical facilities where need can be shown, with provision for local administration and control. It has opposed the grandiose plans of the Wagner bill. The Board of Trustees and the officers of the American Medical Association have repeatedly offered their facilities and help and advice to the government in working out any sound plan for meeting immediately any needs which may be demonstrated.

EXPERIMENTING WITH STATE MEDICAL SOCIETY PLANS

While captious critics have been denouncing the American Medical Association as reactionary and obstructive, its members have been conducting numerous and extensive experiments during the last seven years in search of ways of organizing payments for medical service and adjusting the burden of medical costs to the abilities of varying economic classes. Never have so many, so varied or so significant projects been carried out in any other country. When the burden of medical care for the indigent disrupted the systems of county and township doctors, drained the resources of philanthropic organizations and became too heavy for gratuitous service by physicians to bear, the various state and county medical societies developed almost the only successful plans for efficiently distributing such resources as were available to provide medical care for the indigent.

During the period 1932 to 1938, between 200 and 300 county societies entered into contracts with relief authorities to provide medical service for the indigent. These were organized to include such protection to the interests of the patients and the public as free choice of physician and economical administration of the always insufficient funds. A number of county societies have also experimented with medical service bureaus for the low income classes. Some of these bureaus are still in operation and have been helpful to many persons in this class in enabling them to meet the costs of needed medical care. All these plans and all those which are now in operation are considered frankly as experiments to be expanded, restricted, altered or abolished as they prove their value in protecting the health of those served. If they are not found desirable they may be abandoned. The medical society stands the loss in time and money expended, but no political, financial or occupational vested interests are created and left behind to hamper further experiments.

Out of the extensive experience with county medical society plans sufficient knowledge has been gained to enable a number of state medical societies to undertake medical service plans on a statewide scale. At present at least fifteen states have such plans in various stages of development. These states include Arizona, Cali-

fornia, Connecticut, the District of Columbia, Massachusetts, Idaho, Michigan, Missouri, New Jersey, New York, Oregon, Pennsylvania, Utah, Vermont and Washington. In some states such arrangements have progressed little beyond endorsement by the house of delegates of the state medical society and the appointment of a committee to prepare a plan. In California, New York, the District of Columbia and Michigan such plans are already offering their service to the public or will do so within the immediate future. In Connecticut, Michigan, New York, Pennsylvania and Vermont, special enabling legislation has been obtained to insure the legality of such plans. In most of the other states, opinions have been obtained from insurance commissioners or other state authorities that the proposed plans are permissible under existing legislation.

There is a wide variation among these plans such as naturally accompanies the experimental stage in the establishment of any social institution. New York and Utah provide for payment of benefits in the form of cash indemnity rather than directly in service. Most of the others provide medical care under close supervision. There is some diversity in the income classes included, although most of them set the upper limit at around \$2,000 or \$2,500 for families, with a lower income limit for individuals. Missouri classifies premiums according to three classes of incomes and according to certain variations as to the number of dependents within each income class.

The information gained from these experiments and obtainable from statistical studies of morbidity and medical care is still insufficient to afford dependable actuarial figures covering the cost of medical care given on such prepayment plans. One reason for this uncertainty is the failure of most previous prepayment plans and especially systems of compulsory sickness insurance to place safeguards around the quality of the service such as to insure that medical standards shall be maintained as high as possible. Neither has any way yet been found to estimate the increased demand for medical care that always accompanies any plan of prepaid medical service.

In the proposed plans, prepayments vary from \$1.50 to \$2.50 a month for individuals, with a lower rate for additional dependents in the same family. Much of this variation is due to provisions which limit the service to what it is believed can be furnished at the rates charged. There are also provisions for deducting the cost of a certain proportion of the first services given in any one year from the coverage of the plan. These restrictions and the methods of acquiring members represent an effort on the part of medical societies to approach a more nearly actuarial basis for operation and to deal honestly with those who are to receive the service. California provides that the subscribers shall pay for the first two calls in any one illness, the District of Columbia for the first \$6, Michigan for the first \$5 and New York for the first \$10 expense in any one

given year. Some states also place a limit to the value of the service that is given in any single year. This is usually placed sufficiently high to cover all but the most exceptional illnesses and to make a substantial contribution where the total is not covered.

All these plans vest control in the medical profession, although several provide for lay members in their governing bodies. In all cases, arrangements are made to provide that medical standards shall be under professional control. The state medical societies have themselves provided, through appropriations from their treasuries and the gratuitous services of the organizing bodies, for the preliminary expenses of organization.

Current Comment

NEW VITAL STATISTICS HANDBOOK

The Bureau of the Census has completed a "Physicians' Handbook on Birth and Death Registration," developed to take the place of the older pocket edition. Copies of this book are being prepared for distribution in large numbers and will be shortly available on request from the Census Bureau and the state health offices. They can also be obtained by secretaries of county medical societies for distribution to their membership. As pointed out in the introduction, the information contained on birth and death certificates serves three cardinal functions: to provide citizens and official agencies with authentic records of births and deaths, to supply public health agencies and the medical profession with essential facts concerning births and deaths, and to furnish, for general social uses, statistical data such as life tables, population estimates and information on residence, migration and fertility. The book gives directions for filling and filing certificates of deaths and births. There is a brief description of the present registration system and the development of registration in the United States. The appendix contains the International List of Causes of Death with its index, a glossary of terms commonly used in vital statistics, a selected bibliography and selected tables and charts of vital statistics. Nearly all the information in this handbook will be needed at some time or another by virtually every practicing physician; distribution of the handbook is made easy and every physician would profit by availing himself of the opportunity to acquire a copy and becoming familiar with its contents.

PUBLIC INTEREST IN VENEREAL DISEASE

The number of clinics treating patients for syphilis during the last fiscal year was 2,405, an increase of 287 per cent over the number for the fiscal year 1930. The number of doses of the arsenical drugs used for the treatment of syphilis amounted in the last fiscal year to 10,656,253, an increase of 84 per cent over the number of doses of such drugs used in 1933. More than five and a half million blood tests for syphilis were made in the United States during the last fiscal year, whereas in 1930 only 1,632,083 blood tests were reported. The larger figures are no doubt the result

of greater public interest in venereal disease control, which has been stimulated by the development of more adequate facilities in the various states made possible by the Venereal Disease Control Act of 1938. Vonderlehr, in addressing a mass meeting in Pittsburgh, pointed out that continued progress in venereal disease control depends on constant improvement of standards in case finding, diagnosis and treatment. He recommended that every community in the United States which has a venereal disease control program check its program against nine elements considered by the U. S. Public Health Service essential to adequate control of syphilis. The nine points are: 1. A trained public health staff which knows how to deal with syphilis. 2. Regulations requiring reporting and follow-up on all cases of syphilis. 3. Facilities for treatment of all patients—both those who can and who cannot pay. 4. Free laboratory service available to all physicians and clinics. 5. Distribution of free antisyphilitic drugs to all physicians and clinics. 6. Blood tests for all pregnant women, and treatment where required. 7. Blood tests of all persons before marriage. 8. Blood tests in all complete physical examinations. 9. An educational program. Syphilis appears to be retreating, it was said, in those communities where the control program includes these fundamental points.

NEW LIGHT ON LEISHMANIASIS

Undaunted by war, the spirit of research is alive in China. Working independently, two groups of workers in Peiping have found that open cutaneous lesions in dogs contain Donovan bodies and evidently are an important factor in the spread of canine leishmaniasis. Feng, Chung and Hoeppli (a Swiss parasitologist)¹ from the Peiping Union Medical College and Ho² from the department of public health in Peiping share in the finding of these conditions in the Far East. Feng and Chung³ report that infection by sandflies from dog to dog was relatively easy and depended directly on the number of flagellates in the cutaneous lesions of the dog. The transmitting sandfly (*Phlebotomus sinensis*) is quite common in North China. It is still an open question whether the canine and human flagellates are identical, but much evidence points in this direction: dogs have been successfully infected with material from human leishmaniasis,⁴ canine cutaneous leishmaniasis and human visceral kala azar have been found in the same household,⁴ and the flagellates found in man, in the dog and in the sandfly were indistinguishable from *Leishmania donovani*.⁵ While cutaneous and visceral leishmaniasis in dogs in the Mediterranean basin has been described, canine leishmaniasis has been found rarely in India in endemic areas of human kala azar.⁶ The results reported from Peiping shed more light on this insidious infectious disease and are of particular importance for its control by the Chinese hygienists.

1. Feng, L. C.; Chung, H. L., and Hoeppli, R.: *Chinese M. J.* 55: 371 (April) 1939.

2. Ho, E. A.: *Chinese M. J.* 55: 566 (June) 1939.

3. Feng, L. C., and Chung, H. L.: *Chinese M. J.* 56: 35 (July) 1939.

4. Feng, Chung and Hoeppli.¹ Ho.²

5. Chung, H. L., and Feng, L. C.: *Chinese M. J.* 56: 47 (July) 1939. Lee, C. U.: *Chinese M. J.* 51: 951 (June) 1937.

6. Adler, Saul: Report, Third International Congress of Comparative Pathology, 1936. Feng, Chung and Hoeppli.¹

ORGANIZATION SECTION

ANNUAL CONFERENCE OF SECRETARIES OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

Held in the American Medical Association Building, Chicago, Nov. 17-18, 1939

Address of Temporary Chairman

DR. ARTHUR W. BOOTH, Chairman of the Board of Trustees of the American Medical Association: I regard this conference of secretaries of extreme importance, perhaps next only in importance, to the House of Delegates. That body, of course, expresses the desires of the entire profession, but it is for you to disseminate that desire to the general practitioners throughout the states. It is customary to have a permanent chairman appointed from your body. I will entertain any nominations.

Dr. Crichton Barker, New Haven, Conn., was chosen and assumed the chair.

Address by Dr. Rock Sleyster

DR. ROCK SLEYSER, Wauwatosa, Wis. (after a description of the various functions of the Association): This wonderful building houses the major activities of your Association. It has been repeatedly enlarged in an effort to provide space to care for ever increasing demands on the Association for service. Each time it was thought the new space acquired would care for needs for many years to come, only to have its capacity taxed to the limit almost immediately. Each year demands grow, and at the present rate of increase in demands for service of present and proposed activities it will not be many years before another addition to the building will be necessary. May I urge that during your stay you visit and become as familiar as time will permit with the various departments of your headquarters and that you urge your membership as well, when in Chicago, to come here and learn first hand of the activities they sponsor, for it is your building, it is their building.

But do not forget, 535 North Dearborn Street is not the American Medical Association. You are the American Medical Association. The 115,000 members you represent, scattered far and wide over this great country, are the American Medical Association. This is only a building, housing your employees, functioning to carry out your directions. These activities have been developed only at your command. No officer, no board, no bureau, council or committee may formulate policy or institute major activities you have not authorized. We who have served here are your servants. We have tried to carry out your directions to the best of our ability. We have worked to develop the progress in medicine you, through your House of Delegates, have instructed us to perfect. We have at all times fought in defense of the policies and ideals you have adopted.

We as a profession have been accused of many shortcomings, but I am confident that there would be no cause for fear if the people could have the opportunity you have today to become familiar with the activities of the Association. And I venture to say that some of the thoughtless criticism by members of our own profession would be stilled by a visit here. I wish it were possible to require each state and county association to send representatives here each year. I know of nothing that would be productive of more good. You secretaries and editors can, however, do much to encourage visits and to carry to your members some better knowledge of the work being done here at their direction—some better realization of the resources available to them and the services which are and can be rendered to them.

I, for one, am proud of this great organization. I am proud of this great headquarters established and maintained without cost to its members. I am proud of the service it renders to its members, to science, to the public. Is this the story of selfishness, of greed? Or is it the realization of a great and unselfish ideal? Is it maintained for material benefits or is it the fulfillment of years of effort and purpose better to serve

humanity? Is this building a monument to personal interest or is it a temple dedicated to higher service, to the protection of the people against fraud and to the defense of the advancement of science and honesty in its application? Name one single activity here which does not bring a hundredfold more benefit to the people we serve than is brought to the individual member in material reward.

Members of the conference—if you will forgive the interjection of a personal motif in my conclusion—I want to say that I have participated in every conference of state secretaries and editors which has been held. I participated many years as a state secretary, as an editor, as a member of the Board of Trustees and this year as your President. It has been an occasion I have always looked forward to with keenest anticipation. To these conferences I am indebted for valuable information acquired and for inspiration to carry on in our great cause. If this were not reward enough for the effort and sacrifice to attend, I have been paid a thousand times by the friendships I have made. You are a truly outstanding group of men. In your hands, more than in any others, lies the destiny of American medicine, for your opportunity for service is greater than that given to most medical men.

It is with a feeling of sadness and regret that I realize this will be my last opportunity after all these years to participate in your proceedings in an official capacity. I want you to know, however, that as a private in the ranks I hope to be with you and "listen in" for old time's sake.

I, for one, cannot go along with those of a defeatist state of mind. I do not believe that the frontiers of medical service have been even reached. Granted that we maintain our ideals and objectives, that we remain true to our duty, that we remain steadfast in our defense of our age old standards of righteousness, I do not believe we shall be forced to defeat in our purpose to continue the advance in good medical care at a cost the people of this country can pay. We are 115,000 strong, a gain of 17,000 during the past five persecution years. We are a truly united profession. No selfish purpose has brought us together; we exist that we may better serve. Let us dedicate ourselves anew to the distribution of this type of service to even the poorest and the humblest home.

Medical Care in the United States

MR. C. ELLSWORTH NYBERG, Chicago: Any survey or statistical study should be preceded by a statement of the problem on which information is desired, an outline of the objectives to be attained, and the method to be used in the study. The Board of Trustees in their resolutions of December 1937 stated the purpose of the nationwide study of medical care. These resolutions were as follows: First, to determine for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable; second, to develop for each county the preferable procedure for supplying these several needs. These resolutions were considered and approved by the House of Delegates of the American Medical Association at the annual session in June 1938. The Board of Trustees also established a Committee on the Supply of Medical Service, which cooperated with the Bureau of Medical Economics in the general conduct of this study.

METHOD OF COLLECTING DATA

The purpose of the study was to discover the number and nature of medical services and facilities in the counties studied, the agencies and methods that exist for the distribution of medical services, the degree to which the available services and facilities meet the medical needs of the various population groups in the surveyed counties and the extent to which desire

for medical services coincided with medical needs. State and county medical societies were asked to prepare reports, based on the factual data collected, containing recommendations of changes that were considered desirable in the methods of distributing medical care.

This term "medical care" as used in this study refers to the service and facilities available from physicians, dentists, nurses and pharmacists, hospitals and related institutions. Since the study was concerned primarily with the distribution of medical services, it was natural to seek information from those persons, agencies or organizations that in some manner arrange to provide medical service as well as from those persons who actually provide the services. Therefore, besides physicians, dentists, pharmacists, nurses and hospitals the sources of information included health departments, welfare and relief agencies, schools and colleges, industrial, fraternal and mutual benefit associations, group hospitalization associations, community health service organizations and other similar organizations.

Numerous statistical studies pertaining to health and medical care have been conducted in the United States since the beginning of this century. One favorite method used in such studies is the selection of a random sample of the population to be surveyed. In the American Medical Association study of the supply and demand of medical care a different procedure of collecting data was followed, since it was believed that a random sample would not be representative of the total population. Instead of applying a stereotyped formula to the problem, the method of obtaining the desired information was chosen to fit the nature of the problem.

Each county, and in some instances a local community within a county, has its own distinctive method of arranging and providing medical care to the indigent and low income groups. Health departments and relief agencies are organized and operated differently throughout the country. Therefore it was believed to be impossible to select a few counties to represent the methods of distributing medical care throughout the United States. The local means already established to provide and arrange for the distribution of medical care is an important factor in determining the method to be used in collecting the data pertaining to such distribution.

The second objective of the study was to recommend preferable procedures for meeting the needs indicated in the study. Before recommendations for changes in the method of distributing medical care could be made, it was necessary to determine the facts concerning the supply and demand for medical care in each county in relation to local conditions and available facilities.

FORMS USED IN THE STUDY

The forms used in this study for collecting data from various sources of information are familiar to you. Nine different forms and a summary sheet were prepared and distributed to the state medical associations for the use of county medical societies. The county medical societies in most cases appointed a committee to direct the survey and this committee was responsible for collecting and tabulating the data and preparing the summary sheet, one copy of which was sent to the state medical association and one copy to the Bureau of Medical Economics.

This study was not designed to produce figures that could be fabricated into a volume of statistical analyses which might be misused as absolute conclusions to describe the availability of medical care in any locality. The comments and suggestions on the method of distributing medical care and the degree to which available services and facilities were being utilized are more important than a mere knowledge of the number of physicians, hospitals and nurses in each county. Obtaining comments and suggestions on medical care was indicated in our statement of the objectives of the study. It seemed important to know not only where and in what way medical services are available but also what the best informed people thought was the preferable method of eliminating any barriers to the more complete distribution of medical care in a particular geographic area.

Frequently, in making a statistical survey, mathematical formulas and statistical devices are used in collecting and

tabulating the data simply because they are considered precise. A mere tabulation of the number of available medical facilities in a particular locality gives no indication of the extent to which such facilities are utilized unless it is also accompanied by information from persons or organizations who provide or arrange for medical services concerning their experiences with the existing methods of distributing these services and facilities.

EXTENT OF COVERAGE

The information collected on these nine different forms was studied, tabulated and summarized by the county committee in charge. The data and comments which were recorded on the original forms were then transferred to the county summary forms provided for that purpose. The greatest value and use of the information obtained in this study should be as a basis for future changes to improve the distribution of medical service.

A total of 862 counties in thirty-eight states with a total population of 49,278,000 were covered by this survey. If we consider persons living in towns of 2,500 population or more as urban, the population covered by this study can be classified as about two thirds urban and one third rural.

VALIDITY OF CONCLUSIONS

The conclusions arrived at from the study of these county summaries by the county committee in charge of the study were not generalizations but specific statements describing the actual experience of the persons responsible for distributing medical care and they were evaluated by a committee familiar with conditions in that particular area.

The amount of information and data contained in each summary sheet varies, just as the facilities and methods of providing medical care to the indigent and low income group varies in each county. The summary sheets contained sufficient data and information to enable the local individuals responsible for the distribution of medical care to discover leads or suggestions for improvements in the distribution of medical service.

Quite a number of committees in charge of these county studies prepared very thorough reports interpreting and evaluating the original data. These reports will serve as a basis for the county medical society to develop a program of improved medical care. These summary sheets and reports are, except for a few special studies, the only compilation of the facts concerning the supply and demand of medical care that have been made in these 862 counties.

STATE REPORTS

One copy of the county summary sheet was sent to the state medical association. This summary sheet then became the basis for a report on medical care for the entire state.

The state medical association's committee then added available material with regard to state institutions that participate in the provision of medical care. A few state medical associations prepared a report of their analysis and conclusions based on the compilation of county summaries and the additional data collected on state institutions. Among the states which made a very complete survey and prepared a state report were New Jersey, Maryland and Delaware.

DELAWARE

The Delaware report describes the available medical facilities and the conditions peculiar to that state and then lists the deficiencies brought out by this survey. In practically every instance these deficiencies were in relation to statewide institutions. Some specific needs indicated were more hospital beds for Negro tuberculous patients and for Negro maternity cases, more institutions for persons with mental diseases and chronic illness, and the care of the aged. Remedies already proposed or being developed to meet the indicated deficiencies were described.

MARYLAND

The Maryland report summarized the needs expressed by physicians, hospitals, welfare and relief organizations, health departments and schools. The physicians believed that there was a need for better classification of the indigent and more

adequate provision of public funds for their care. Hospital officials desired more thorough investigation of patients requesting free hospital service. Health departments and welfare and relief agencies stated that they worked in close cooperation with physicians and hospitals and that they experienced no difficulty in obtaining medical service for needy persons. The summary of the reports from schools showed that pupils examined and found to be in need of corrective medical treatment often failed to receive such treatment because of their parents' indifference or unwillingness to cooperate with school officials and physicians. All sources of information indicated a need for additional medical facilities for persons with chronic illnesses and mental diseases.

NEW JERSEY

One of the most complete and exhaustive state surveys was made by the New Jersey State Medical Society. Information was collected in every county and a summary form prepared including comments and suggestions for meeting existing deficiencies. The report by the state medical society discussed every phase of this study according to the source of information. The data obtained from each particular group were tabulated and analyzed. Conclusions based on these details were presented.

The various state departments which arrange for or provide medical care were considered separately. For example, one chapter described and discussed the facilities available in the state for the treatment of cancer; another discussed the venereal disease clinics. One of the more general conclusions arrived at in the New Jersey study was that hospital insurance was believed to be a great aid in meeting the problem of hospital expenses for the low income group. The New Jersey Medical Society then made further tests of the supply of medical care. In July 1938 the New Jersey Medical Society broadcast a statement by radio and in newspaper stories offering free medical care to any one in New Jersey needing medical care which he had been unable to obtain. In October, three months later, the president of the New Jersey Medical Society announced that only 127 requests had been received and turned over to the proper county medical society. Each request was investigated and medical services were provided where needed. According to the New Jersey Medical Society this investigation revealed that applicants could obtain medical care if they knew how to go about getting it. Many of the applicants had not attempted to obtain the services of a private physician nor had they presented their cases to health departments or relief agencies. Some had already received medical care but were not completely satisfied with it.

PENNSYLVANIA

The State Medical Society of Pennsylvania also made an excellent survey and prepared a well written report of the total area covered. This included fifty-one of the sixty-one counties in Pennsylvania. The report is organized as individual reports from each county. The state medical society committee prepared a short summary of the data and information on a statewide basis but it stated that the statewide report would be of less practical value than county reports. Each county report contained a description of the county, its population, a list of all the persons and organizations who arranged for or provided medical care, and a compilation of the amount of free medical services provided by each group during 1937. Following this there is a discussion of the need for expanding or enlarging certain medical facilities, and of why certain persons had not obtained needed medical care. This report of exact detailed conditions by counties is especially useful for further study of the demand and supply of medical care in each county. One county may have an excellent system of providing medical care to the indigent but such a system may not apply or may not be needed in other counties. Therefore a state report by counties may be of more practical value than a general report of the entire state.

KENTUCKY

The Committee on Medical Economics of the Kentucky State Medical Association prepared a complete report of factual data in relation to medical care in Kentucky. This report, which

was published in the August 1939 Bulletin of the Department of Health, contains a description and discussion of the population with regard to growth and economic status, a tabulation of all the medical facilities and organizations which arrange or provide medical services, and vital statistics for the entire state. This report contains a treatment of the same data for each county in Kentucky.

CHICAGO

Certain individual county medical societies in almost all the states conducted thorough surveys and summarized data into a concise and informative report. The Chicago Medical Society deserves special mention for the survey made of the medical care and facilities in Cook County. Every source of information was considered and called on to supply data for this report. Physicians returned 1,603 forms, dentists 370, general and special hospitals eighty-one, nursing organizations eleven, health departments eighteen, a district state health officer one, public and private relief agencies and social workers 285, public and parochial schools fifty-eight, colleges and universities seventeen, industrial organizations and union and benefit associations 258, and pharmacies 242. The complete report describing and discussing data obtained from these many sources makes a book of 268 pages, so organized that information on any particular group or institution can be easily found. Conclusions and interpretations of the Committee on Medical Economics of the Chicago Medical Society, which conducted the survey and prepared the report, are also included. A considerable portion of the report is taken up with individual comments and suggestions that support these conclusions.

OTHER COUNTY SUMMARIES

Some of the other county medical societies which made complete investigations and reports on the supply and need of medical care in their particular area were the Middlesex South District Medical Society in Massachusetts, the Monroe County Medical Society in Tennessee, the Providence Medical Association in Rhode Island, the Washington County Medical Society in Iowa, the Rock County Medical Society in Wisconsin, the Harris County Medical Society in Texas, the Vanderburgh County Medical Society in Indiana and the Marion County Medical Society in Kansas. These county medical societies tabulated the data from every known source and then prepared a concise report stating their conclusions and supporting them with comments as well as stating why they believed their conclusions were valid.

Any one interested in learning how a small medical society whose members are all engaged in rural medical practice made a thorough study of all the factors implicit to the distribution of medical care in a rural area and prepared a concise but still complete report of their conclusions should read the Monroe County Medical Society of Tennessee report. This county medical society of fifteen members had no special facilities or funds to carry out this study, but they experienced no undue difficulty in obtaining complete information from all sources as a basis for their conclusions.

The 614 other county medical societies which have not been mentioned returned summary sheets of the data they collected, including comments and in some cases special reports. All these summary sheets or reports contained specific information concerning medical care in that county.

VALUE OF COUNTY REPORTS

In interpreting data collected in a small area covered by a county there is little need for generalization, since each comment or suggestion can be treated individually. Special local features of distributing and providing medical care can be given the proper place and described in detail. Any claims or statements that medical care is not available can be investigated and a specific remedy suggested and applied.

The general summary based on all the county and state reports prepared by the Bureau of Medical Economics contains tables showing that 623 local medical societies in thirty-eight states conducted the survey in 862 counties which had a total population of 49,278,000. A total of 22,397 physicians and dentists and 16,290 other persons or organizations returned completed forms which were used in the study.

FREE SERVICE FROM PHYSICIANS

The returns from physicians and dentists were not always separated on the county summary sheets. The ratio of returns on the forms which did indicate physicians and dentists made it possible to estimate that about 17,000 physicians reported. These 17,000 physicians stated that they had served 2,927,108 persons without charge during 1937, that is approximately 6 per cent of the population covered by the study, but the total number of physicians reporting was approximately 27 per cent of the physicians practicing in the area. Therefore it can be safely estimated that between 10 and 15 per cent of the population received free service from physicians in the home and office during 1937. These same 17,000 physicians reported that they had donated 2,051,954 hours of free care to patients in the hospital outpatient departments and clinics during the year.

FORMS 1 F

An additional tabulation of the amount of free service rendered by physicians was made from data collected in the forms 1 F. These were actual weekly records kept by the physicians in three different weekly periods during the year and were returned directly to the Bureau of Medical Economics for editing and machine tabulation. According to the figures recorded on 9,936 weekly records, 835,716 patients received medical service in the home or office during one week. This represents an average of eighty-four patients who received some medical service from each physician during a week. A total of 9,840 weekly records of free medical services showed that 134,200 patients received medical services from physicians in the home or office for which no charge was made. This represents an average of about fourteen patients a week for each physician. According to these figures, about 16 per cent of the total number of patients seen in patients' homes or physicians' offices received free service. This percentage does not include patients served free in hospital outpatient departments or clinics or the number of patients who received service and later failed to pay. Previous studies indicate that about 20 per cent of the fees charged were not paid.

This compilation of free services from weekly records of physicians was made entirely separate from the general survey. The results obtained support the conclusions based on the general survey that from 10 to 15 per cent of the population received free medical services from physicians.

HOSPITALS—FREE SERVICE

A tabulation of the number of public charges and the number of free patients cared for in reporting hospitals also was made. Returns from 1,336 hospitals showed that they had cared for 505,128 public charges and 721,216 free patients during 1937. The type of hospital was not indicated in every case, so it was impossible to determine the total number of general hospitals and special hospitals or type of control—governmental, private or nonprofit. Such a breakdown can be made in each county, since the type of hospitals can be easily checked.

The total figures from hospitals can be useful as an indication of the amount of free hospital service, but one is limited in making any general statements concerning free care in hospitals for the total area since the size of the hospitals, the type and the ownership are not available in every instance.

METHOD OF OBTAINING INFORMATION ON LACK OF MEDICAL CARE

Each of the nine different forms used in collecting the data for this study contained a question as to any specific inability to obtain medical care. Each person filling out the form was requested also to supply comments or suggestions concerning any observed lack of medical care and to indicate the method which he believed should be considered in seeking a remedy for such a situation. The answers to these questions are of great significance, since they were directed not only to physicians but to the public health and visiting nurses, health department officers, welfare and relief officers and school officials. The activities of such individuals in each locality should make them aware of any deficiency in the medical facilities or in the distribution of medical care, since they have every oppor-

tunity to discover if any person is unable to obtain medical care. Since they are largely responsible for providing or arranging for medical care, they would be aware of any difficulty in furnishing medical care under existing systems of distribution.

Our conclusions on the deficiencies of medical care are based on repetition and consistency of replies from this group. The most significant feature of these replies is their general agreement in describing any local conditions that indicated a lack of adequate medical care or of special arrangements for providing it.

CONCLUSIONS ON LACK OF MEDICAL CARE

According to the expressed opinions of those best qualified to judge, there is no large group of individuals in any part of the surveyed area who were unable to obtain medical services which they desired. The few isolated cases in which individuals had not received needed medical services were usually found to be due to the fact that they either did not want medical service, made no attempt to obtain it or refused to accept free service.

It was evident also from the replies that institutions for the care of persons with mental diseases, chronic illnesses and tuberculosis needed to be increased or expanded. In most cases local programs were being developed to increase the facilities according to the needs and different conditions in each particular area.

Another general conclusion borne out by practically all the replies is that a large number of school children do not receive the medical care recommended after school examinations, owing to their parents' indifference or procrastination. These recommendations for medical services for school children were almost entirely for dental care, removal of tonsils and adenoids, and the provision of eye glasses.

The comments also indicated that most states and counties had not developed a successful plan for handling indigent transients. Such individuals were depending on free services from physicians, dentists and hospitals but in some areas the large number of transients made it necessary that the responsibility for their medical care be assumed by the local government.

These general conclusions based on consistent repetition of comments are useful in that they show clearly the need for developing certain general plans for improving the distribution of medical care.

A careful analysis of the material collected in this survey indicates that the important factor in improving the distribution of medical services is to develop and experiment with a specific program in a small area such as a county or city. There is no way in which a general plan can be prescribed for the whole surveyed area when there are such diversified existing conditions in each county and city. A plan usually works very well in one area because it has been developed to fit the needs and conditions in that area and therefore may not be applicable or beneficial to another area.

A practical solution for the indicated deficiencies in a given community must be developed according to the existing facilities and special conditions indicated in the county survey. Similar surveys to determine progress toward meeting the problems that were revealed in this present study can be made. These later studies will bring out new needs and will furnish suggestions for ways to meet them.

DISCUSSION

CHAIRMAN BARKER: Perhaps you will let me have a moment here to tell you briefly of the pattern we followed in my own small state of Connecticut. We had an idea that, if we could get the state government interested in such a study, provided it could be made under the proper auspices, the results would become a public document rather than a report of what might be accused of being a biased group, the medical profession. We went before the general assembly in 1939 with a rather extraordinary bill which, in the hurly-burly of other things, was passed. A commission is now at work, financed with state funds from the governor's executive budget. It has no definite appropriation. We are at liberty to retain the full time field workers and experts, and we are charged with reporting our observations and recommendations to the general assembly of 1941. That study is now under way. I

am the chairman of the commission making the study. In addition, there is another member of our state society, the superintendent of our largest hospital, a nationally known figure in the field of public health, who is connected with the Yale School of Public Health, another physician who is not a member of the state medical society, a retired public health official and a layman, a member of the minority party in our senate. Our document will be a public document and we shall be given the opportunity at least to recommend to our statesmen the deficiencies that exist in our state.

The Wagner Health Bill

DR. W. C. WOODWARD, Chicago: In the early part of the year the President sent to the House of Representatives a message: "Message of the President of the United States transmitting the annual message on Health Security." The President began: "In my annual message to the Congress, I referred to the problems of health security. I take occasion now to bring this subject especially to your attention in transmitting the report and recommendations on national health prepared by the Interdepartmental Committee to Coordinate Health and Welfare Activities.

"In August 1935, after the passage of the National Security Act, I appointed the Interdepartmental Committee to Develop Health and Welfare Activities. They have reviewed unmet health needs and the desirability of developing a national health program. They shall develop the outlines for such a program."

Then there is the reference to the notorious health conference held in Washington for the purpose of endorsing this particular program. We have these significant words from the President: "The objective of a national health program is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and care for sickness and disability, to safeguard mothers, infants and children, and to offset through social insurance loss of earnings among workers who are temporarily or permanently disabled."

There is no distinction there between the attention that shall be given to persons who are able to provide medical services for themselves and those who are not, but "the objective of a national health program is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and care for sickness and disability."

The President commended the report of the Interdepartmental Committee.

Those of you who are familiar with the Constitution know that all bills for raising revenue must originate in the House of Representatives. The Social Security Act is an act that proposes to raise revenue, so this message was addressed primarily to the House of Representatives. It was referred to the House Ways and Means Committee. The Committee on Ways and Means had decided that in proposing amendments to the Social Security Act it would limit its amendments solely to those having to do with what we may term economic relief rather than health relief.

Activities then were transferred to the Senate side on the initiative of Senator Wagner. We understood that the senator was engaged in the drafting of a health bill of some kind. We wrote to him, and I appeared at his office on various occasions trying to get in touch with him. I even had a letter of introduction from the Medical Society of the State of New York, but that did not secure contact. In fact, I have never been able to make contact with Senator Wagner regarding this bill. The bill, we learned, was being drafted by his legislative clerk, aided, I know, by various representatives of the Public Health Service, the Children's Bureau, the Social Security Board and outside agencies. I had no knowledge of the bill until the day it was introduced in the Senate. Then we had a carbon copy of it twenty-four hours or more in advance of the general public, but no chance to suggest amendments. That bill is supposed to implement this report of the Interdepartmental Committee. [Dr. Woodward then outlined the Wagner bill, S. 1620.]

Then came the hearings before the Senate subcommittee, which has issued a preliminary report. You may recall that the House

of Delegates of the American Medical Association proposed that grants-in-aid for health and medical services be given to any state on proof of need and that some proper agency be established to determine whether need had or had not been proved. The committee, however, unfortunately has stated the case very differently in its preliminary report. The committee said: "Some witnesses have objected to the grants-in-need pattern embodied in the bill. They have urged that there should be a federal officer with authority to approve aid to some states in dire need of assistance and withhold it from other states with lesser need. However, the questioning by the committee brought out that, the more closely these witnesses inspected the procedure necessary for an equitable grant-in-aid program, the closer they approached to just such a pattern as is embodied in the bill, with some divergence of opinion as to the amount of money to be authorized or as to the details of the standards to be followed in making allotments."

I sat through all the hearings. I heard, I think, practically every word that was said, and I challenge any one to show anywhere in the record any proposal that there should be a federal officer to pass on the needs of the states. But the American Medical Association recommended a federal agency which might be similar to the Reconstruction Finance Corporation; that might, for that matter, be the Reconstruction Finance Corporation itself, because the proposition is altogether the determination of financial need. Then there was certainly no reference to provide that there should be that distinction between those in need and those in lesser need. It was a question of need, proved to the satisfaction in the first place of the officer who is familiar with the program proposed and, second, to the proper financial agency.

In the course of the hearings, questions were repeatedly asked, often by Senator Wagner, sometimes by others: "Can you point out anything in this bill that will permit the state agencies to whom grants are to be given to provide medical services for persons of ample means to provide them for themselves?" Not one of the witnesses who appeared could point out anything in the bill that would permit a state health officer, or any other state officer, to provide hospital and medical services for rich people. But, as a matter of fact, there is absolutely not one word in the bill that limits the benefits to be conferred to persons who are poor, or even to persons in moderate means. The benefits that this bill proposes to offer are available to every one, from the richest millionaire in the community to the poorest citizen.

Here is a rather interesting point of view that the subcommittee has taken: "The appropriation sections of titles V, VI, XII and XIII of the bill include, as being especially among the purposes of the authorization, to assist rural areas, or, in title XIII, individuals suffering from severe economic distress. Some witnesses would go further in this direction. They recommend that the bill be amended so as to limit exclusively to needy or to medically needy persons the health services, financially aided by grants-in-aid contemplated by the bill. It is not always made clear, however, precisely how one or the other of these groups is to be defined without limiting the effectiveness of the health programs in the states so as to defeat the purpose of the bill for the improvement of the health of the population. We have already reviewed the overwhelming body of evidence submitted at our hearings showing that medical costs may be burdensome and medical care inadequate to tens of millions of our people in income brackets above the level of those who are in receipt of any form of public assistance.

"Any useful definition of the medically needy must recognize that a large proportion of the entire population may be greatly burdened by sickness costs and may at any time be among the medically needy, even though otherwise self supporting. Furthermore, many health problems transcend geographic, economic or social boundaries, for some health service must obviously be made available on a community-wide basis to all families and be paid for from general tax funds."

Then they proceed: "Other witnesses, representing large groups of population, have emphasized the inadequate services received by self-supporting families and individuals of small incomes. They have recommended that the bill be amended to require as a condition for the receipt of federal aid specific health insurance programs in the states to meet the needs of self-

supporting persons with incomes up to \$3,000, or even a higher limit." Then they point out the objection that may be raised by those persons to have anybody inquire into their ability to pay.

Those are the views that the subcommittee itself has set forth, and I think we shall have to be prepared to meet them. Some persons whose legislatures meet annually or who have a session only every other year have gotten the impression that in Congress a bill expires at the end of the session. That is not the case. It expires at the termination of the Congress. So this is still before the committee.

The bill has been demonstrated to be an entirely unsatisfactory and irrational and unreasonable bill. We are assured that the subcommittee will present a new bill sometime during the coming session of Congress. We have solicited the opportunity of participating in the framing of any such new bill. Up to the present, however, no opportunity has been afforded to join in the drafting of the proposed new bill or new amendments.

The burden of seeing that the bill that is to be enacted during the coming session of Congress, if any bill is enacted, is a sound bill is, more than ever, going to fall on those who represent state medical societies. You who are back home, who can make contacts directly and indirectly with your own congressional delegations, ought to make such contacts before they return to Washington in January. You ought to represent to them the readiness of the American Medical Association to go along in any rational program, and its eagerness to do anything it can to make any program that may be proposed a rational program—which the Wagner Health Bill is not!

The Platform of the American Medical Association

DR. MORRIS FISHBEIN, Chicago: The Board of Trustees has asked me at this point to interpolate a statement relative to a proposed platform for the Association.

The Board of Trustees recognizes that the policies adopted by the House of Delegates prevail. Therefore the platform which it sets forth is derived from sessions of the House of Delegates.

Following the report of the reference committee of the House of Delegates, twenty-two points in relationship to the Wagner bill were adopted by the House of Delegates. These represented the basis of the appearance of your representatives before the hearings of the subcommittee in Washington. In the report of those twenty-two points far more attention was given by the press of the country generally and, indeed, by physicians as well, to the opposition to the Wagner bill than was given to the five or six points which concluded and which were wholly constructive. These recognized that the American Medical Association, representing some 115,000 physicians, has a definite obligation to the people of this country in relation to the provision of medical service.

We have gained great objectives during the period which Dr. Sleyster so aptly characterized as the five persecution years. The medical profession of this country is capable of defending its faith in the principle of the private practice of medicine as the main principle in the development of medical practice in this country. We are not opposing now; we are asking the government to go forward with the medical profession in attaining a wider distribution of medical and preventive medical services based on actually demonstrated needs in various communities of the country. [Dr. Fishbein then presented the platform of the American Medical Association and the discussion as printed editorially in *THE JOURNAL* November 25, p. 1966.]

In a recent trip which I took through the Western states I learned of certain bills brought up in Western legislatures asking them to match federal appropriations. Federal officials came out to solicit those state legislatures to pass those bills with the wording developed in Washington, in order that Washington might then give to the state the money Washington had. In other words, the Congress appropriates the money, then federal agencies go out and sell to the states the idea of spending the money. The states may not ask for the money in the first place and may not want the money; sometimes it would be a considerable burden on those states to spend the money efficiently. That situation must be avoided in relation to any health legislation developed in this country.

Local determination is fundamental to the right of the individual states and communities to determine for themselves what their needs are and not to have their needs sold to them by the federal government. It is basic in maintaining the kind of medical practice, the kind of preventive medical practice that has prevailed in this country for so many years and which has given us the extraordinarily satisfactory conditions we have today. In the same message the President sent to the Congress, to which Dr. Woodward has already referred, the President pointed out that we have attained the lowest sickness and death rates in our history. Just yesterday the United States Public Health Service made the statement that our maternal mortality rate has dropped within recent years 23 per cent below former levels. This represents a tremendous gain in the control of maternal mortality. In other words, this country is not in the throes of a serious emergency, with people dying right and left for lack of medical care, with innumerable mothers' lives being wasted for lack of medical care.

There has been a vast propaganda in an endeavor to sell the national health program, so called, to the people. Now perhaps the federal agencies that have done so much to sell the program have begun to see the futility of their method of approach. Now they have gone back to the point where they sell themselves to the people instead.

HOSPITAL FACILITIES

If you were at the hearings in Washington, you got the idea that there has been no building of new hospitals in recent years in the United States. With PWA funds and WPA labor, and under the Federal Works Administration and innumerable other administrations, they have been building hospitals to a considerable extent. Recently Morrill, in analyzing hospitals built with federal funds in Michigan, showed that eight hospitals so built were unnecessary, showed that not one of the hospitals could function especially efficiently as a hospital, having no specialists, no laboratory, no x-rays and in many instances being close to large cities with magnificent hospital facilities. He showed in addition that not one of the communities in which the hospitals were put down could maintain those hospitals without something like \$5 to \$8 per capita annually as a tax on the local community for the maintenance of the hospital, something far beyond the ability of any small community in the state of Michigan to bear. Those are examples of the fact that there has been vast spending, uncontrolled, unscientific, uneconomic and unwarranted.

What we need is, first of all, utilization of space now existing in our nonprofit, voluntary hospitals—perhaps the best in the world—space which is up to now from 25 to 30 per cent not utilized. The propaganda in relationship to the building of hospitals with federal money is probably the worst of all the propaganda associated with the national health program. Obviously, what we stand for there is the kind of experimental programs that are already being attempted in many places and in many states, led by the medical profession itself, in an endeavor to gain under the American system of practice a wider distribution of medical service to all the people. Such experiments, properly controlled by physicians in the community according to the standards set by the American Medical Association for the quality of service, we can encourage to the utmost.

The introduction into this nation of a federal security plan whereby the nation itself, as a federal agency, will step intimately into the sickness and life of every person in the country will be the first step in the breakdown of American democracy. Indeed, all forms of security, compulsory security, even against old age and unemployment, represent a beginning invasion by the state into the personal life of the individual, represent a taking away of individual responsibility, a weakening of national caliber, a definite step toward either communism or totalitarianism. The people of this country today have begun to awaken to the insidious approach of such new forms of government.

Present Horizons

DR. AUSTIN A. HAYDEN, Chicago: The matters that have been presented this morning show clearly the differences of opinion in regard to the national health survey and to the survey that has been conducted by the American Medical Association. I must pay tribute as a private practitioner of medicine to the

efforts that Dr. Braasch and his committee have put forth in making that survey. I think it is one of the most helpful things the Association has ever undertaken. It is not completed by any means.

The need and the demand are the points by which principally these various reports differ. The need will never be completely met. All of the health surveys that have been made, of course, show greater need than is demanded. Few, if any, demands for medical aid have been turned down by physicians in physicians' offices, in physicians' clinics or in any place in which they work.

The Board of Trustees has recently held a meeting with the hospital groups, the American Hospital, the Catholic Hospital and the Protestant Hospital associations. A similar meeting has been held with the American Dental Association and with the American College of Physicians. Just yesterday a meeting was held with the American College of Surgeons, a most harmonious meeting. Think of the change that has occurred in the attitudes of various organizations in the past ten years. In that meeting every one desired that duplication be avoided by the two organizations, that every help should be given one to the other so that hospitals will not be examined too frequently to say whether or not they are proper places for sick people to be.

The platform is a positive program, designed to be applicable to every section of the country.

DISCUSSION

MR. C. S. NELSON, Ohio: I should like to direct a question to Dr. Woodward. What will be the attitude of the American Medical Association with respect to specific amendments to whatever bill is presented to Congress, whether it is the Wagner bill, a revised Wagner bill or some new bill? Before the last session every member of Congress in Ohio was interviewed by a committee of physicians. We paid particular attention, of course, to Senators Taft and Donahy. We had a definite understanding with most of them and, I think, if the Wagner bill had come to a real issue on the floor, we would have had an almost unanimous vote against it from the Ohio delegation. We have found in Ohio—and we are no different from other states, although I think we have a reasonable degree of success in legislative activities—that amendments are pretty valuable. Sometimes you can cure a bill pretty quickly with amendments. I think that is up to some body of the American Medical Association.

DR. OLIN WEST, Chicago: Perhaps some things need to be said that have not yet been said with respect to the status of this legislation. For the first time in several years the American Medical Association has been given assurances from official sources, including a member of the subcommittee of the Committee on Education and Labor which conducted the hearings on the Wagner bill, that the representatives of the organized medical profession will be given opportunity to confer with that committee and perhaps with others who may be interested in the objectives of legislation designed to extend public health and medical service. I have within the last few days received a very encouraging letter from Senator Murray. Apparently there have been no meetings of the subcommittee of the Committee on Education and Labor of the Senate since the hearings on the Wagner bill were closed. Senator Murray specifically states that there will be no further meetings of the committee until some time in January. There are those who are constantly urging the American Medical Association to introduce a bill of its own. There are those who did insist for a considerable time that we should amend the Wagner bill in its various sections. It is my personal opinion that that would have been highly inadvisable. For the last ten years or more ardent proponents of compulsory sickness insurance have utilized their utmost endeavors to force the American Medical Association into the position of having introduced legislation in the Congress of the United States to provide for a great, comprehensive system of voluntary sickness insurance that would be, after all, politically controlled. It would be the first and the inevitable first step toward the enactment of other legislation providing for compulsory sickness insurance. I think we have been crippled by the assumption of a defeatist attitude on the part of many of our own members. I don't believe there is any occasion for the assumption of any defeatist attitude. The principles for which organized medicine

stands are strong enough and meritorious enough, humane enough and sound enough to deserve the support of every physician and of every intelligent citizen.

DR. EDWARD H. CARY, Dallas, Texas: The gentleman from Ohio raised a question which I think was embarrassing to all of us in Washington. Whenever a bill comes up in Washington, written by any one and presented, if you go there to a hearing the man who is interested in that bill is going to run you up a tree to find out "How would you amend this bill to make it satisfactory?" If you are not prepared to amend the bill, he will say "Well, you are just against all legislation." In defense of the position of our committee that went to Washington, I would say that I called on several senators, and one commended us for not being drawn into the position of trying to amend the bill. He said "You would have been hopelessly involved and you would have lost if you had tried to amend that bill; you were wise not to do so." That happens to be an expression from one of the senators on the subcommittee. This is a complicated question. The American Medical Association cannot write a bill and cannot present a bill tagged as a bill of the American Medical Association. We have a positive platform. We must have a definite understanding with Dr. McCormack, Dr. Underwood and many of our friends who are public health men. From a personal standpoint, there should be men in the Senate that we know, or men in the House of Representatives that we know—that some of you know—who think along the same lines as we think, who appreciate the platform as a good document, sound Americanism and sound in policy. Some of them ought to be able to write a bill that would reflect the principles in which we believe.

DR. A. T. McCORMACK, Louisville, Ky.: I think I feel with you, especially those of you who have had any experience in legislative matters, an entirely hopeful attitude as a result of the splendid statement of principles that has been presented to us this morning. It is natural for us as a profession to be conservative. We know tried methods in medicine. We know that the practice of medicine in the United States has been successful in giving us the best health conditions and the best medical service that there is on the globe. Our objective is to do some of the things that have been left undone and do them in some of the spots which have not yet received the beneficence of our science. Legislation is going to be proposed. You have here the principles adopted and specific instructions as to what the amendments should be to make it conform to these principles. We can go to the American people with these principles and secure their support for them because they are constructive. If we really and seriously mean that we are for legislation that will effectuate these purposes, then we can win any fight in Congress. I don't think there is any question that we can defeat the Wagner bill at any time. I think it would have defeated itself if enough members of Congress had ever read it, because it was hopelessly impossible. It couldn't have been administered. It couldn't have been operated. It would have been a futile expenditure of money and would have caused irreparable damage and loss of impetus to the whole public health and the whole medical service. Here today we have again established ourselves firmly on the basis and foundation of a program that is right. Let's stick to it. Each of us is a secretary of a state medical association. In your state, if your health department doesn't conform to your policies, it is the fault of the state medical association of your state because it hasn't done anything about it. If your medical profession wants to control public health policies in your state, all you have to do is to assume that control. Every now and then I hear somebody say that the health officers of this country are going to dominate the American Medical Association. There are four of us in the House of Delegates and there never have been five even when West used to be there as state health officer. During that time our average brain power was much higher than it is now.

DR. HOLMAN TAYLOR, Fort Worth, Texas: I want to make inquiry of those in charge as to the nature or character of the distribution of the results of this survey of medical services. Anticipating a demand, we have sought to make up 100 packages on the subject of socialized medicine. Among these packages we have been seeking to place the results of this survey. In Texas, schools are mainly interested in what the conditions are

in Texas. To those who make inquiry on the subject we have a little summary our office made of the survey that was made in Texas. Will these reports be so distributed that those of us who want them can get a reasonably large number of copies for distribution? Concerning the eight points, I want to acclaim those as a fine statement of principles. I think it would be good if we could work in here, perhaps under 5, attention to the fact that a man is not medically indigent until he is not able to buy medical service, and the facts in the case must be determined locally and not nationally.

DR. OLIN WEST, Chicago: There were all sorts of groups that participated in the surveys in the individual states, including physicians, dentists, pharmacists, nurses, public officials, hospital administrators and staffs and civic clubs. In most instances the conclusions arrived at by the representatives of these various groups were exactly the same. Pharmacists, social service workers, civic clubs, health officers, public officials agreed in many of the items covered by this survey. We hope to have this report soon available. I don't know how big a volume it will be, but I do want to say to you that in case of need we

shall try to provide you with something that may be helpful to you. If we can provide you with the whole report, we shall try to do that.

DR. W. C. WOODWARD, Chicago: A question was asked as to amendments. I want to emphasize that the proper way to propose a proposed bill or proposed amendment would be for those who are interested to sit around a table and talk the matter over and agree as far as they can agree, and agree to disagree where they cannot agree, and go before Congress in that way. The difficulty is that the opposition in this case, if I may call it the opposition, is apparently doing everything it can to prevent a conference of this sort. I have before me a copy of the program of the American Association for Labor Legislation which is to meet in Philadelphia December 27, 28 and 29. I find that James E. Murray, United States Senator from Montana, chairman of the Hearing Committee on the Health Bill, is to talk on the latest proposals for a National Health Program. It is obvious that he is going to have some information assembled before the 28th.

(To be continued)

OFFICIAL NOTES

THE NEW YORK SESSION

Special Features Authorized for the Scientific Exhibit

Several features have been authorized by the Committee on Scientific Exhibit for the New York session:

Special Exhibit on Fractures under auspices of a committee composed of Dr. Kellogg Speed, chairman, Chicago; Dr. Frank D. Dickson, Kansas City, Mo., and Dr. Walter Estell Lee, Philadelphia.

Special Exhibit on Lamé Backs under the auspices of a committee composed of Dr. Frank R. Ober, chairman, Boston; Dr. Carl E. Badgley, Ann Arbor, Mich.; Dr. J. Archer O'Reilly,

St. Louis; Dr. Arthur Steindler, Iowa City, and Dr. Philip D. Wilson, New York.

Special Exhibit on Fresh Pathology under the auspices of a committee of which Dr. Harrison S. Martland, Newark, N. J., is chairman.

Exhibit symposiums on heart disease and peripheral vascular disease, under the guidance of committees headed by Dr. Thomas M. McMillan, Philadelphia, and Dr. Norman E. Freeman, Philadelphia.

In addition to the foregoing, the usual exhibits in conjunction with the fifteen sections of the Scientific Assembly will be shown. Applications for space will close February 1. Application blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

WOMAN'S AUXILIARY

California

At the autumn meeting of the auxiliary to the Los Angeles County Medical Association in Los Angeles Dr. George D. Maner discussed pending legislation of interest to the medical profession.

Mrs. Frederick N. Scatena, president, auxiliary to the California Medical Association, addressed the auxiliary to the Marin County Medical Society in Fairfax recently on the history of the auxiliary.

Georgia

An auxiliary to the Fourth District Medical Society was organized at a recent meeting in La Grange. Mrs. Kenneth Grace was elected president. Mrs. Eustace A. Allen, president of the auxiliary to the Medical Association of Georgia, addressed the group on the aims and objectives of the auxiliary.

The auxiliary to the Tift County Medical Society was organized recently in Tifton. Mrs. C. A. Fleming was elected president.

At the September meeting of the auxiliary to the Fulton County Medical Society in Atlanta Dr. Wadley Glenn reported on his recent world tour, and Dr. Edgar H. Greene, president of the Fulton County Medical Society, told of plans for the new building for the society. At the October meeting of the auxiliary Dr. Jack Norris spoke on "Milk in Relation to Health," and Mrs. W. M. Dunn presented material selected from *Hygeia*.

The semiannual meeting of the auxiliary to the Fifth District Medical Society was held at the Academy of Medicine in Atlanta October 5. Dr. George H. Semken, New York, spoke on "Women's Interest in Cancer," and Dr. William H. Myers, president of the Medical Association of Georgia, spoke on "Solving the Cancer Problem."

Kansas

The chief objective of the auxiliary to the Shawnee County Medical Society this year is to increase subscriptions to *Hygeia*.

Mrs. Frank E. Coffey, chairman of the printing and supplies committee of the auxiliary to the American Medical Association, was speaker at a meeting of the auxiliary to the Central Kansas Medical Society in Hays recently.

Mrs. C. D. Korsar, chairman of the Hygeia Committee of the auxiliary to the Kansas Medical Society, was speaker at the autumn meeting of the auxiliary to the Cloud County Medical Society in Concordia.

New York

The second annual Health Institute of the auxiliary to the Medical Society of the County of Kings was held in Brooklyn October 10. Speakers were Dr. Philip I. Nash, president of the Medical Society of Kings County; Dr. Charles Solomon, chairman, subcommittee on food and drugs of the Public Health Committee; Dr. Walter Bromberg, psychiatrist in charge, Court of General Sessions, New York City Police Department; Dr. Adele Streeseiman, chairman, Advisory Council to the Woman's Auxiliary of Kings County Medical Society; Dr. Jean A. Curran, Long Island College of Medicine; Dr. Herbert R. Edwards, director, tuberculosis division, department of health; Dr. Thomas A. McGoldrick, medical director, St. Anthony's Hospital; Dr. Foster Murray, director of tuberculosis, Kingston Avenue Hospital, and Dr. Eugene R. Marzullo, chairman, Public Health Committee. The Health Institute was presented by the auxiliary as its contribution toward health education. Representatives of the board of health and the Brooklyn Tuberculosis and Health Association presented exhibits and demonstrations.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Ceasar G. Cahen, for twenty-seven years chief surgeon of the French Hospital, Los Angeles, was presented with a diploma November 4 designating him chief consulting surgeon of the hospital for life.—Dr. Ruggles A. Cushman, Cloverdale, has been granted a retired membership in the California Medical Association.

Society News.—Dr. Joel J. Pressman showed a motion picture study of the larynx before the Los Angeles Society of Ophthalmology and Otolaryngology at a meeting December 18; Drs. Isaac H. Jones and William T. Grant discussed "The Elsberg Precision Measurements of the Sense of Smell."—Among others, Dr. Ernest M. Hall spoke before the Los Angeles Heart Association December 13 on "Etiology of Calcified Nodular Aortic Stenosis."

CONNECTICUT

Dr. Putnam Lectures on Epilepsy.—Dr. Tracy J. Putnam, director of services of neurology and neurosurgery, the Neurological Institute of the Columbia-Presbyterian Medical Center, New York, delivered the second annual lecture to be given before the faculty and students at Yale University School of Medicine, New Haven, December 1, under the auspices of the Yale chapter of Nu Sigma Nu. His subject was "Modern Concepts of Epilepsy and Its Treatment."

DELAWARE

Society News.—Dr. Edward H. Richardson, associate professor of gynecology at the Johns Hopkins University School of Medicine, Baltimore, addressed the New Castle County Medical Society, Wilmington, November 21 on "Use of Hormones in Gynecology."

DISTRICT OF COLUMBIA

Director of Venereal Disease Control.—Dr. George M. Leiby, Raleigh, for the last three years director of the division of venereal disease control of the North Carolina State Department of Health, has been appointed as the first full time director of the venereal disease service for the District of Columbia.

Society News.—Dr. Jesse G. M. Bullowa, New York, addressed the George Washington University Medical Society October 21 on "The Doctor's Responsibility to Pneumonia Patients."—At a meeting of the Georgetown Clinical Society November 21 Dr. Harry Zehner spoke on "Cardiology."—Dr. Norvell Belt discussed "Testicular Tumor with Endocrine Disturbance" before the Clinical Club of Washington November 7.—Among the speakers before the Washington Society of Pathologists at the Army Medical Museum recently were Drs. Virgil H. Cornell on "Undifferentiated Small Cell Carcinoma of Small Intestine" and George Tolstoi, "Granulosa Cell Tumor of the Ovary."—Included among the speakers before the Washington Ophthalmological Society November 6 was Dr. John W. Burke on "Field Changes Following Satisfactory Filtration Operation for Glaucoma."—Dr. Walter E. Dandy, Baltimore, addressed a meeting of the medical and dental officers of the navy on duty in the District and vicinity at the Naval Medical School December 4 on "Head Injuries."

GEORGIA

Jonte Eguen Memorial Lecture.—Dr. Harris P. Mosher, emeritus professor of laryngology and Walter Augustus Leconte professor of otology, Harvard Medical School, Boston, will deliver the third Jonte Eguen Memorial Lecture in Atlanta January 26 before the Fulton County Medical Society.

New Chair of Surgery.—The endowment of the J. B. Whitehead chair of surgery at Emory University School of Medicine has been announced in the *Bulletin* of the Fulton County Medical Society. The new position was made possible by the gift of \$250,000 by the Joseph B. Whitehead Foundation.

Special Society Elections.—Dr. John L. Elliott, Savannah, was elected president of the Georgia Tuberculosis Association at its annual meeting in Alto in November.—At a meeting of the Georgia Industrial Surgeons' Association recently in Brunswick Dr. Robert L. Rhodes, Augusta, was chosen president; Dr. Richard E. Newberry, Atlanta, vice president, and Dr. John W. Simmons, Brunswick, secretary-treasurer.

Society News.—At a meeting of the Macon Medical Society of Bibb County in Macon recently Dr. Milford B. Hatcher, Macon, discussed "Treatment of Burns with Skeletal Support in Severe and Extensive Burns of the Lower Extremity."—Dr. Julian K. Quattlebaum read a paper entitled "Cancer of the Stomach" before the Georgia Medical Society in Savannah recently and Dr. Elzie N. Gleaton presented a case of "Sarcomatosis in a Baby One Month Old."—Dr. Joseph H. Boland gave a clinical talk on football injuries before the Fulton County Medical Society, Atlanta, November 16 and Drs. Carter Smith and Henry C. Sauls discussed "Coronary Occlusion—A Clinical and Electrocardiographic Study of 100 Patients." All are from Atlanta.

ILLINOIS

Personal.—Dr. Paul H. Harmon, formerly director of the crippled children's bureau for the state department of welfare of Illinois and instructor in orthopedic surgery at the University of Chicago, has been appointed to the staff of the Guthrie Clinic and Robert Packer Hospital, Sayre, Pa., as orthopedic surgeon, effective January 1.

Stop-and-Go Lights at Postgraduate Conference.—At a postgraduate medical conference in Champaign December 7 an ingenious device was used to assist speakers in staying within the twenty minutes allotted for papers. A stop-and-go light on the table showed green as the speaker began his address, turned yellow when three minutes was left and red when the twenty minutes was at an end. The apparatus was made by local men and, according to the secretary of the state medical society, Dr. Harold M. Camp, Monmouth, it is recommended for keeping speakers from running over specified time limits. The Champaign conference was the second in a series sponsored by the state medical society; 208 physicians representing sixty-five cities and towns in thirty counties attended.

Chicago

Dr. Heiser to Give Public Lecture.—Dr. Victor G. Heiser, New York, will address the next public meeting of the Chicago Medical Society January 3 at the Chicago Woman's Club, on "Will There Be Another Smallpox Epidemic?"

Society News.—At a meeting of the Chicago Gynecological Society December 15 the speakers included Drs. Ralph E. Campbell, Madison, Wis., on "Angular Pregnancy"; Louis Rudolph, "Pseudo-Uterus Bicornis," and Morris Edward Davis, "Stilbestrol, a New Synthetic Organic Estrogen: A Clinical Study."

Society Branch Meetings.—At a meeting of the North Shore Branch of the Chicago Medical Society December 5 Dr. William Barry Wood Jr., Boston, spoke on "Treatment of Pneumococcal Pneumonia." Dr. Howard K. Gray, Rochester, Minn., addressed the North Side Branch December 7 on "Problems Associated with Surgery of the Biliary Tract." The Evanston Branch was addressed December 7 by Dr. Henry C. Sweany on "Pathogenesis of Tuberculosis, Municipal Tuberculosis Sanitarium."

INDIANA

Study of Hunting Accidents.—With a view to reducing hunting accidents, a survey of these accidents is being made under the direction of Virgil M. Simmons, commissioner of the state department of conservation. Game wardens have been provided with special forms and will call on physicians in an effort to assemble data on persons whom they have treated who have been involved in hunting accidents. Questions included in the forms cover such subjects as the nature and results of the injuries sustained, type of firearms involved, style and color of various articles of clothing worn, whether the accident occurred under heavy cover or in open fields, whether the accident involved more than one person and a statement explaining how the accident occurred. The study has been undertaken as a means of determining the major hazards of hunting.

Society News.—A symposium on diseases of metabolism was presented before the Indianapolis Medical Society November 28 by Drs. William E. King, James O. Ritchey, Marion R. Shafer, Brandt F. Steele and Harold F. Dunlap. The

society was addressed by Dr. James S. McLester, Birmingham, November 7; his subject was "Nutrition and Present Day Living." Drs. Edwin W. Dyar Jr., Robert M. Dearmin and Russell A. Sage discussed "Head and Face Pain from the Standpoint of Ophthalmology and Otolaryngology" before the society December 19. Dr. Edward C. Rosenow, Rochester, Minn., addressed the society December 12 on "Experimental and Clinical Studies on the Relation of Streptococci to Various Diseases."—Dr. William B. Tucker, Chicago, addressed the Tippecanoe County Medical Society in Lafayette October 17 on "Primary Carcinoma of the Lungs."—Dr. Carl P. Huber, Indianapolis, discussed "Bleeding in Pregnancy and Labor" before the Northeastern Indiana Academy of Medicine in Kendallville November 16.—Dr. Henry J. John, Cleveland, addressed the Muncie Academy of Medicine November 14 on "Diabetes and the Relation to It of Some Metabolic Diseases." Weston A. Price, D.D.S., Cleveland, addressed the academy December 12 on "Nutrition and Modern Degeneration, Physical, Mental and Moral."—The LaPorte County Medical Society was addressed in Michigan City November 16 by Dr. Arthur Earl Walker, Chicago, on "Early Manifestations of Intracranial Lesions."—At a meeting of the Gibson County Medical Society in Princeton November 13 Dr. Max Cutler, Chicago, discussed the diagnosis and treatment of cancer.—The Wayne-Union Counties Medical Society was addressed in Richmond November 9 by Dr. Richard M. Davison, Chicago, on "Surgical Treatment in Pulmonary Tuberculosis."

IOWA

Personal.—Dr. James Frederic Clarke, Fairfield, was honored at a banquet given by the Jefferson County Medical Society November 9 in recognition of his completion of fifty years in the practice of medicine.—Dr. Edwin N. Hesbacher, formerly of Minneapolis, has been placed in charge of the Polk County health unit.

KANSAS

Personal.—Dr. Harry W. Davis, Plains, was recently appointed health officer of Meade County.—Dr. Charles F. Menninger, Topeka, was recently made an honorary member of the Shawnee County Medical Society in observance of his completion of fifty years in the practice of medicine.

Society News.—At a meeting of the Butler-Greenwood County Medical Society in El Dorado recently Dr. Ralph L. Drake, Wichita, discussed brain tumors.—Dr. John L. Lattimore, Topeka, addressed the Clay County Medical Society in Clay Center recently on "Newer Laboratory Methods and Their Interpretation."—Dr. Benjamin P. Smith, Neodesha, discussed diabetes before the Wilson County Medical Society at a meeting in Neodesha recently.—At a meeting of the Wyandotte County Medical Society, Kansas City, December 19 the speakers included Drs. Thomas G. Orr, Kansas City, Mo., and Galen M. Tice, Kansas City, on "Carcinoma of the Breast."—The Sedgewick County Medical Society was addressed in Wichita, November 21 by Dr. Edward H. Hashinger, Kansas City, Mo., on "Causes and Treatment of Obesity" and November 7 by Drs. Christian A. Hellwig and Frank L. Menehan, Wichita, on "Coronary Sclerosis" and "Embryoma of the Kidney" respectively.

KENTUCKY

District Meeting.—The fifth and tenth councilor districts held a joint meeting in Frankfort December 13 with the Franklin County Medical Society as host. At an afternoon session Drs. John Harvey, Lexington, and DeLou P. Hall, Louisville, presented papers on "Sulfapyridine in the Treatment of Pneumonia" and "Carcinoma of the Colon" respectively. In the evening Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, made an address on "American Medicine and the National Government" under the auspices of the county society and the Frankfort Forum Club.

Society News.—Dr. Vilray P. Blair, St. Louis, addressed the Jefferson County Medical Society, Louisville, November 20 on "Treatment of Cancer of the Face."—Dr. Kenneth W. Brumback, Cynthia, addressed the Harrison County Medical Society, Cynthia, November 6 on "Diagnosis and Treatment of Lobar Pneumonia."—Dr. Arthur T. McCormack, Louisville, addressed the Boyle County Medical Society, Danville, December 19 on "Medical Social Security."—Drs. Milton S. Lewis, Nashville, and George E. Pryor Jr., Hopkinsville, addressed the Christian County Medical Society in Pembroke November 14 on "Diagnosis and Management of the Posterior

Position" and "Diagnosis and Management of the Goiter Case" respectively.—At a meeting of the Muldraugh Hill Medical Society in Elizabethtown December 14 the speakers were Drs. Harry S. Andrews, Louisville, on "Recent Methods of Treating Pneumonia"; John W. Fish, Louisville, "Common Eye Injuries, Their Diagnosis and Treatment"; Clyde C. Carroll, White Mills, "Differential Diagnosis of the Acute Exanthemata," and John M. English, Elizabethtown, "Ethics of the Medical Profession."—Drs. William N. Lipscomb and Rufus C. Alley, Lexington, addressed the Bourbon County Medical Society, Paris, November 16 on "Anemias of Childhood" and "Practical Management of Rectal Abscesses and Fistulae" respectively.

LOUISIANA

Personal.—Dr. William K. Evans, Lake Providence, has been appointed health officer of West Carroll Parish, succeeding Dr. William J. Buffalo, Oak Grove, who resigned to engage in private practice in North Carolina, it is reported.

MARYLAND

Society News.—At a joint meeting of the Medical Society of the District of Columbia and the Baltimore City Medical Society December 1 in Baltimore the speakers were Drs. Wallace M. Yater, Washington, D. C., on "Pathogenesis and Prognosis of Bundle Branch Block" and Thomas Bradley, Washington, D. C., "Management of Intractable Pain."

Medical Board for Occupational Diseases.—The governor recently appointed a state medical board for occupational diseases with the following members: Drs. Raymond Hussey, chairman, Nathan B. Herman and John W. Pierson, all of Baltimore. The creation of the board was provided for in the new state occupational disease law regulating compensation in this field.

Seminars on Industrial Hygiene.—The committee on industrial health of the Medical and Chirurgical Faculty of Maryland has recently inaugurated a series of sixteen seminars on industrial hygiene. The series opened with introductory remarks October 25 by Dr. Carl M. Peterson, Chicago, Secretary of the Council on Industrial Health of the American Medical Association. Dr. John M. McDonald, director of the bureau of occupational diseases of the Baltimore health department, spoke on "Occupational Health Hazards of the Industries in Maryland." Other speakers included:

Theodore C. Waters, Baltimore attorney, October 31, The Formulation of Occupational Disease Legislation.

Henry D. Sayer, former commissioner of industrial diseases of the state of New York, November 7, The Operation of a State Industrial Commission.

Thomas N. Bartlett, manager, claim division, Maryland Casualty Company, Baltimore, November 21, The Insurance Aspects of Compensation for Occupational Diseases.

Walter F. Perkins, vice president, Koppers Company, Bartlett Hayward Division, Baltimore, December 5, Industrial Health: An Employer's Point of View and Attitude.

John P. Frey, president, metal trades department, American Federation of Labor, Washington, D. C., December 19, Industrial Health: The Employee's Point of View.

The program for January, February and March is not yet available. It is planned to give attention to the hazards of carbon monoxide and dusts and to the general problems of preventing and controlling the occupational diseases.

MASSACHUSETTS

Personal.—Dr. Clarence G. Lane has been promoted to be clinical professor of dermatology at Harvard Medical School and Dr. Francis R. Dieuaide to be associate professor of medicine.—Dr. Frank M. Vaughan, Boston, was recently appointed a member of the state board of registration in medicine.

Free Public Lectures.—A series of free public lectures on medical subjects will begin January 7 at Harvard Medical School. Lecturers include the following members of the faculty:

Dr. Chester M. Jones, January 7, Digestion and Indigestion.
Dr. Charles C. Lund, January 14, Serious Accidents—What to Do and What Not to Do.

Dr. Chester S. Keefer, January 21, What About Sulfanilamide?

Dr. Perry C. Baird Jr., January 28, Care of the Complexion.

Dr. Paul D. White, February 4, Facts and Fancies About Heart Disease.

Dr. Grantley W. Taylor, February 11, Cancer.

Gerry B. Schnelle, February 18, The Medical Care of Domestic Pets.

Dr. Donald Macomber, February 25, Sterility (for women only).

Dr. Frank R. Ober, March 3, Backache.

Dr. William B. Breed, March 10, Health in Middle Age.

MICHIGAN

Honored at One Hundred.—Dr. John McLean, Hartford, was honored at a banquet November 14 by Masons of southwestern Michigan in observance of his one hundredth birthday. Dr. McLean graduated at Northwestern University Medical School, Chicago, in 1873 and was licensed to practice in Michigan in 1902.

Special Society Elections.—Dr. James A. Olson, medical director for the public schools of Flint, was elected president of the Michigan School Health Association at a recent meeting in Grand Rapids. —Dr. Mark F. Osterlin, medical superintendent of the Central Michigan Children's Clinic, Traverse City, was chosen president of the Michigan Pediatric and Infectious Disease Society at its annual meeting in Ann Arbor November 25; Dr. Campbell Harvey, Pontiac, was made vice president, and Dr. David M. Cowie, Ann Arbor, was reelected secretary.

Society News.—Dr. Henry Field Jr., Ann Arbor, discussed "Subclinical Pellagra in Michigan" before the Wayne County Medical Society, Detroit, December 11. A joint meeting with the Detroit Physiological Society was addressed December 18 by Clarence A. Mills, Ph.D., Cincinnati, on "Climatic and Weather Information on Health." —Dr. Raymond W. Waggoner, Ann Arbor, addressed the Genesee County Medical Society in Flint December 6 on "The Organic Background for Psychoses and Neuroses." —Dr. Orus R. Yoder, Ypsilanti, discussed "Psychologic Management of the Patient" before the Jackson County Medical Society November 21. —Dr. Evan V. Shute, London, Ont., discussed "Use of Endocrine Products in Gynecology and Obstetrics" before the Kalamazoo Academy of Medicine November 21.

MINNESOTA

Radiologic Meeting.—The Minnesota Radiological Society held its fall meeting at the Mayo Clinic, Rochester, December 2. Included on the program were the following:

- Drs. Clarence A. Good Jr. and Arthur B. Hunt, Experiences with Roentgenologic Pelvimetry.
- Dr. Harry M. Weber, The Proctosigmoiditis of Lymphogranuloma Venereum.
- Drs. John A. L. McCullough and John D. Camp, Pseudo-Fractures in Diseases Affecting the Skeletal System.
- Dr. Everett E. Seedorf, The Evaluation of Prostigmine, Barium Chloride, Oxygen and Pitressin for the Elimination of Flatus, in Roentgenograms of the Abdomen.
- Dr. Stuart W. Harrington, Intrathoracic Tumors.

A symposium on primary carcinoma of the lung was presented by Drs. John W. Olds, Edgar H. Little and Eugene T. Leddy and in the evening at dinner Dr. Harry M. Worth discussed "Radiology in England" and Dr. Shao-hsun Wang, "The Practice of Medicine in China."

Society News.—At a meeting of the Minnesota Academy of Medicine in St. Paul November 8 Dr. Gilbert J. Thomas, Minneapolis, spoke on "Genital Tuberculosis." —Walter J. Meek, Ph.D., Madison, Wis., discussed "Effects of the General Anesthetics and Sympathomimetic Amines on Cardiac Automaticity" in a Mayo Foundation lecture in Rochester November 16. —The Hennepin County Medical Society devoted its meeting in Minneapolis November 29 to a symposium on headache; the speakers were Drs. Gordon R. Kamman, St. Paul; George E. McGeary, Lawrence R. Boies and Reuben A. Johnson. A symposium on joint injuries and their associated problems was presented before the society November 22 by Drs. Edward T. Evans, Miland E. Knapp and John H. Moe. —At a meeting of the Minnesota Pathological Society in Minneapolis December 19 the speakers were Drs. Charles E. Rea on "Present Day Concept of the Undescended Testis" and Nathaniel H. Lufkin, "The Myocardium in a Case of Myxedema."

NEW JERSEY

Health Association Meeting.—Dr. Leverett D. Bristol, Montclair, was elected president of the New Jersey Health and Sanitary Association at the annual meeting in Asbury Park November 17-18. Dr. Edward Guion, Northfield, was elected secretary.

Society Plans Exhibit for the Public.—The public relations committee of the Essex County Medical Society announces an "Exhibit for the Laity" to be held February 5-10, to acquaint the public with various phases of medical care and treatment. Thirty-three separate exhibits have been planned. Among them are fractures and industrial medicine, crime detection, cancer, pneumonia, venereal disease, hay fever, transfusions, necropsies, tuberculosis, a model operating room, eye conservation, medical history. The Essex County Dental Society and the

New Jersey Pharmaceutical Association have been invited to present appropriate exhibits also. A program of evening lectures is being planned as part of the program.

Society News.—Dr. William Wolf, New York, addressed the Atlantic County Medical Society, Atlantic City, December 8 on "Procedures Common in Endocrinology." —Dr. Priscilla White, Boston, discussed diabetes in an address before the Camden County Medical Society, Camden, December 5. —Dr. Frank L. Meleney, New York, addressed the Academy of Medicine of Northern New Jersey, Newark, December 21 on septicemia. —Dr. Edwin H. Place, Boston, addressed the Hudson County Medical Society, Jersey City, December 5 on "Experiences in Diagnosis and Treatment of the Acute Infectious Diseases." —Dr. Manfred Kraemer, Newark, was elected president of the New Jersey Gastroenterological Society at the annual meeting December 4; Dr. Hyman I. Goldstein, Camden, vice president, and Dr. Sydney Rosenthal, Newark, secretary. —A program on pneumonia was presented before the Bergen County Medical Society, Hackensack, December 12 by Drs. Wheelan D. Sutliff, Norman H. Plummer and Charles Hendee Smith, all of New York.

NEW YORK

Society News.—Dr. George B. Eusterman, Rochester, Minn., addressed the Geneva Academy of Medicine at its annual dinner meeting November 16 on "Nonsurgical Aspects of Certain Acute Abdominal Conditions." Drs. William S. McCann, Rochester, and Samuel A. Munford, Clifton Springs, were guests who discussed the paper. —Dr. Ralph S. Bromer, Bryn Mawr, Pa., addressed the Schenectady County Medical Society, Schenectady, November 7 on "Roentgenologic Skeletal Changes in the Diseases of Infants and Children." —Dr. Henry C. Sweany, Chicago, addressed the Nassau County Medical Society, Garden City, November 28 on "What the Doctor Should Know About Tuberculosis."

Dr. Ross Honored.—The Suffolk County Medical Society gave a dinner November 25 at Smithtown honoring Dr. William H. Ross, Brentwood, in recognition of his fifty years of medical practice. Tributes were paid to Dr. Ross by Drs. Terry M. Townsend, New York, president of the Medical Society of the State of New York; Peter Irving, New York, secretary of the state society; Alec N. Thomson, Brooklyn, editor of the *Bulletin of the Medical Society of the County of Kings*; Frank Overton, Patchogue, editor of the *Journal of the Medical Society of New Jersey*; Arthur D. Jaques, Lynbrook, president of the Associated Physicians of Long Island, and Willetts W. Gardner, Patchogue, president of the Suffolk County society. Dr. Ross, who is 77 years old, has been president of the state medical society, the Associated Physicians of Long Island, the Suffolk County society and the New York Association of Superintendents and Managers of Tuberculosis Sanatoria, among other offices.

New York City

Investigation of Salmonella.—A center for the investigation of Salmonella has been established at Beth Israel Hospital, Stuyvesant Park East, under the direction of Dr. Friedrich Schiff of the department of bacteriology. The center is willing to investigate without charge doubtful cultures for Salmonella. The work is being done in cooperation with the International Salmonella Center in Copenhagen, Denmark.

Friday Afternoon Lectures at the Academy.—The Friday Afternoon Lectures at the New York Academy of Medicine during January and February will be as follows:

- Dr. Yale Kneeland Jr., Primary Bronchopneumonia, January 5.
- Dr. Donovan J. McCune, Recent Advances in the Clinical Use of Vitamin D and Related Compounds, January 12.
- Dr. Martin Henry Dawson, Treatment of Chronic Arthritis, January 19.
- Dr. James Burns Amberson Jr., Choice of Treatment for Pulmonary Tuberculosis with Special Reference to Newer Surgical Procedure, January 26.
- Dr. Carl H. Smith, Management of the Anemias in Infancy and Childhood, February 2.
- Dr. George Gray Ward, Recent Advances in Gynecology, February 9.
- Dr. George M. MacKee, Recent Advances in Dermatology, February 16.

New Directors of Hospital Service Plan.—Seven new directors have been added to the board of Associated Hospital Service of New York, five representing the medical profession and two the administrators of hospitals. The physicians, appointed from a list submitted by the county medical societies in the metropolitan area, are Drs. John J. Masterson, Brooklyn; Milton J. Goodfriend, Charles Gordon Heyd, New York; Joseph Wrana, Jamaica, and Eric H. G. Restin, Mount Vernon. The hospital administrators are Drs. Joe R. Clemmons, New York, and George O'Hanlon, Jersey City, N. J.

Society News.—Speakers at a stated meeting of the New York Academy of Medicine December 7 on disorders of the venous and lymphatic systems were Drs. Cecil K. Drinker, Boston, on "Participation of the Lymphatics in Acute and Chronic Inflammations"; Bayard T. Horton, Rochester, Minn., "Clinical Aspects with Respect to the Venous System," and Gerald H. Pratt, "Surgical Considerations."—Speakers before the New York Roentgen Society December 18 included Drs. Samuel J. Goldfarb, Burrill B. Crohn, David Adlersberg and Marcy Lee Sussman, who presented a symposium on the small intestine.—Dr. Sara M. Jordan, Boston, gave a Friday afternoon lecture before the Medical Society of the County of Queens November 17 on medical aspects of gastric disease.—Dr. William S. Collens gave a Friday afternoon lecture of the Medical Society of the County of Queens December 15 on "Organic Peripheral Vascular Disease."—The New York Academy of Medicine announces that dates for the Thirteenth Graduate Fortnight will be Oct. 14-25, 1940.

Hospital Celebrates Seventy-Fifth Anniversary.—The Hospital for Ruptured and Crippled marked its seventy-fifth anniversary with a dinner November 2 at the University Club. Speakers who discussed various phases of the hospital's work and history were:

Dr. Fenwick Beckman, attending surgeon at the hospital.
Dr. George E. Bennett, associate professor of orthopedic surgery, Johns Hopkins University School of Medicine, Baltimore.
Dr. William E. Gallie, dean, University of Toronto Faculty of Medicine, Toronto, Ont.
Dr. Robert B. Osgood, professor emeritus of orthopedic surgery, Harvard Medical School, Boston.
Dr. Eugene H. Pool, clinical professor of surgery, Cornell University Medical College and Columbia University College of Physicians and Surgeons.
Dr. Paul C. Colonna, professor of orthopedic surgery, University of Oklahoma School of Medicine, Oklahoma City.
Dr. Philip D. Wilson, clinical professor of orthopedic surgery at Columbia and surgeon in chief at the hospital.

To mark the anniversary Dr. Beckman has written a 157 page history of the hospital, which has grown from an institution accommodating twenty-eight persons to its present capacity of 250 beds.

New Dean at New York Medical College.—Other Faculty Changes.—Dr. Ferdinand C. Lee, associate professor of surgery, Johns Hopkins University School of Medicine, Baltimore, has been appointed dean of New York Medical College, Flower and Fifth Avenue Hospitals. Dr. Lee will also be professor and head of the department of surgery. He succeeds as dean Dr. Claude A. Burrett, who has been made president of the college and hospitals. Dr. J. A. Werner Hetrick has been appointed associate dean and Mr. David Q. Hammond, director of the hospitals. Other appointments to the faculty include:

Dr. Thomas I. Hoeh, recently head of the department of neurosurgery and neurology at St. Luke's and St. Mary's hospitals in Montreal, Canada, professor of neurosurgery and head of the department of neurosurgery and neuropsychiatry.
Dr. Richard Townley Paton, recently surgeon on the staff of the Manhattan Eye, Ear and Throat Hospital, professor and head of the department of ophthalmology.
Dr. William H. Everts, who took the degree of doctor of medical sciences at Columbia University College of Physicians and Surgeons in 1936 and received later training in the New York Neurological Institute, professor of neurology.

NORTH CAROLINA

Hospital News.—The cornerstone of a new building for the Presbyterian Hospital, Charlotte, was laid November 15. The Duke Endowment contributed \$150,000 toward the new building. The present hospital will be remodeled for a nurses' home.

Society News.—Dr. Franklin Webb Griffith, Asheville, addressed the Buncombe County Medical Society, Asheville, December 4 on "Urgent Surgery on Infants."—Speakers at a meeting of the Catawba Valley Medical Society, Lenoir, November 14, were Drs. Ernest Washington Franklin Jr., Charlotte, on "Traumatic Postpartum Hemorrhage"; Frederick Mast Dula, Lenoir, "Diagnosis of Appendicitis," and Yates Shuford Palmer, Valdese, "Treatment of Lower Extremity Varicose Veins by Ligation and Injection."

PENNSYLVANIA

Society News.—Dr. Frederick M. Jacob, Pittsburgh, addressed the Westmoreland County Medical Society December 19 at the Mountain View Hotel near Greensburg on "Inflammatory Diseases of the Skin—Eczema, Psoriasis, Hives (Erythemas)."—Drs. Edward F. Hartung, New York, and Francis C. Grant, Philadelphia, were guest speakers at the semiannual clinic meeting of the Lycoming County Medical Society, Williamsport, November 10, on "Rheumatoid Arthritis" and "Diagnosis and Treatment of Cerebral Lesions" respectively.

WEST VIRGINIA

Council Approves Platform.—The council of the West Virginia Medical Association at a meeting in Charleston December 14 adopted a resolution approving the recommendation of the American Medical Association for a federal department of health with a physician as head. The resolution also expressed approval of the entire platform recently set forth by the Board of Trustees of the Association.

GENERAL

Sectional Meeting on Ear, Nose and Throat.—The Eastern section of the American Laryngological, Rhinological and Otological Society will hold its annual meeting in Pittsburgh January 5. The speakers will include Drs. Francis W. Davison, Danville, Pa., on "Acute Laryngotracheobronchitis"; Carl H. McCaskey, Indianapolis, "Etiology and Treatment of Seventh Nerve Paralysis"; James G. Dwyer, New York, "Present Status of Otitic Meningitis," and Fred W. Dixon, Cleveland, "Practical Points in the Treatment of Sphenoiditis."

Changes in Status of Licensure.—The Indiana State Board of Medical Registration and Examination reports the following:

Dr. Joseph _____ license revoked November 16.
Dr. Harry _____ revoked November 16 because of admitted _____ of rendering him unfit for practice.
Dr. Scott R. Edwards, New York, license revoked November 16 because of admitted drug addiction to the extent of rendering him unfit for practice.

The Kansas Board of Medical Registration and Examination announces the following:

Dr. John R. Clark, Independence, license revoked June 13 for gross immorality, having been convicted of a felony.
Dr. Charles C. Keester, Wichita, license restored June 27.

The Massachusetts Board of Registration in Medicine reported the following:

Dr. David H. Shulman, Brookline, license restored August 18.

The Washington state department of licenses reports the following action:

Dr. Edna V. Dale, whose last known address was Yakima, license revoked recently for violation of the narcotic laws.

Progress of Venereal Disease Control.—Every state and territorial health department in the United States had a separate division or subdivision for control of venereal diseases by the end of the fiscal year 1939, the U. S. Public Health Service reports. In 1938 twenty-seven states were so organized. About 103,000 persons were discharged from clinics as cured or with syphilis arrested in 1939 as compared with 78,000 in 1938, the report continued. Persons brought under treatment for the first time numbered 315,000 and the number of treatments administered was 8,000,000. Nineteen states now require examinations including blood tests for syphilis of all applicants for marriage licenses and fifteen require physicians to perform blood tests for syphilis on expectant mothers. In 1939 2,405 venereal disease clinics reported to the public health service, an increase of 37.7 per cent over 1938. Research activities were continued, many of them in cooperation with various medical groups and with state and local health departments. Training centers in venereal disease control have been established for physicians and nurses in nine universities. The service allotted \$2,400,000 of its \$3,000,000 appropriation for 1938-1939 to state health departments, and the funds were supplemented by \$4,300,000 in state and local funds.

Government Services

Health in the Civilian Conservation Corps

The death rate in the Civilian Conservation Corps for the fiscal year ended June 30, 1939, was 2.02 per thousand as compared with 2.38 for the previous year. A great reduction in the case fatality rate in pneumonia was reported: 4.1 as compared with an average rate for the preceding five years of 12.6. The rate of incidence of pneumonia was also much lower than in any year of the corps' existence except 1934. Tuberculosis caused a slightly lower death rate in 1938, 5.3 as compared with 6 per hundred thousand the previous year. There were nine cases of typhoid with no deaths, a rate of 3.4 cases per hundred thousand enrollees. In 1935 the rate was 25.9 and the next year it dropped to 7.8, a reduction attributed to improvement in water supplies and methods of handling waste and to the greater protective value of a new vaccine introduced in 1936. The most frequent communicable diseases in the corps were influenza and other respiratory diseases.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 25, 1939.

Reorganization of Scheme for Treatment of Air Raid Casualties

When the present scheme for the treatment of casualties from air raids was prepared it was assumed that a large number might have to be dealt with quickly, and 200,000 hospital beds were made available within twenty-four hours. London had to be taken as a target area and, as far as possible, hospital patients in it were removed to safer areas. So far no air raids on any scale have occurred. There has been an opportunity to reorganize the scheme. Some 700 specialists left their private practice and work in the London hospitals for full time posts in the emergency medical service and went to staff the outlying hospitals. The salaries paid by the government involved hardship for senior men with heavy financial responsibilities. Recommendations were made by the Central Medical War Committee and accepted. The result is that only a nucleus of the medical staff will be employed full time. A large proportion of the specialist work will be done by part time officers, who will be free to engage in private practice but will undertake in consideration of the payment of \$2,500 a year to come up for service when required. They will give, without additional remuneration, whatever services the number of casualties may from time to time require of them. Thus most of the specialists will be able to return to their private work and their hospitals. The remainder of the service will be composed of another grade of part time officer, who will come up for duty when called on.

In the provinces there are many hospitals to which no whole time officer of the emergency medical service will be attached. The responsibility for treating air raid casualties will fall on the medical staff, who normally give their services free in these hospitals. Under another recommendation of the war committee which the government has accepted, they will be remunerated out of a pool provided by the payment to the hospital of 36 cents a day for each bed occupied. If the patient is treated in the outpatient department the physician will be remunerated out of a pool provided by the payment of 12 cents for each outpatient attendance. The casualties for whose treatment the government is accepting financial responsibility include not only civilians injured in air raids but also the injured taken from ships, the sick and casualties from the fighting forces and unaccompanied evacuated children.

The staffing arrangements of first aid posts have also been revised. The original arrangement provided for a medical officer and a trained nurse in attendance at each post. In the 1,150 posts in the more vulnerable areas the medical officer in charge will be paid a fee of \$375 a year, the employment to be for six months in the first instance. He will also receive \$7.50 for a session of not more than two hours and \$16 for a longer session whenever he attends at the post to deal with casualties.

Twenty-eight casualty evacuation trains have been equipped, but ten of these have been transferred to the war office for the use of the fighting services. For interhospital ambulance work 350 coaches, normally used for passenger traffic, have been converted into ambulances, but the situation is now such that 153 of them will be released.

The Army Blood Transfusion Service

With the help of the Royal College of Surgeons, the army medical service evolved an organization before the war to supply an army in the field with sufficient stored blood. When war broke out this skeleton organization was expanded to

form the army blood transfusion service, which consists of a home unit responsible for the supply of stored blood and an oversea unit responsible for its distribution. The home unit is enrolling volunteer blood donors who will give at stated intervals quantities of their blood, which is bottled and conveyed by airplane oversea. Distribution to forward units is then carried out by mobile refrigerator vans. The army blood transfusion service is responsible, either directly or indirectly, for the blood transfusion arrangements for all the fighting forces. As our military effort increases, the amount of blood required will increase. Therefore the roll of blood donors must be augmented. Within the next year the army aims at a roll of 250,000 volunteers, both men and women. They all know that the giving of blood will not impair their working efficiency, even for a short time. Blood transfusion has been performed in various recent campaigns, but no parallel exists in the world for an organization such as now exists in the British army.

Fatal Confusion of Procaine with Percaine

A physician desiring to administer a local anesthetic to a patient suffering from arthritis went to a pharmacist's shop and asked for a 2 per cent solution of procaine. He later received a bottle labeled "Not to be taken; sterile solution of percaine 2 per cent, 50 cc., Poison." He read the label and referred to the manufacturer's catalogue, where he found listed a 2 per cent solution of percaine for use "exclusively in surface anesthesia." He decided that it would serve his purpose and injected about 12 cc. around the patient's shoulder. Within five minutes she said that she felt faint. She then went into convulsions and died after about half an hour from heart failure and acute edema of the lungs.

At the inquest the physician stated that he thought that the use for surface anesthesia did not exclude subcutaneous injection. When he went to the pharmacist he did not know that there was such a preparation as 2 per cent percaine, though he had heard the name. He knew that procaine was a normal local anesthetic and that percaine was more commonly used as a spinal anesthetic and that if he had asked for percaine he would have had to sign the poison book. In cross examination he admitted that he did know that percaine was ten times as poisonous as procaine. In his evidence the dispenser of the bottle stated that the physician asked for percaine. A medical representative of the manufacturers said that percaine was a synthetic local anesthetic with properties like those of cocaine and might be injected into the tissues, but 2 per cent solution was not safe. The proper strength in this case would have been 0.1 per cent, while 2 per cent of procaine would have been suitable. A pathologist gave evidence that percaine was a proper drug to administer in this case but that the strength was too great. The coroner said that it was dangerous to give a verbal order for a drug and that when the physician found that percaine was sent he could have rung up the pharmacist. The jury returned a verdict of death from misadventure with negligence on the part of the physician and pharmacist, but not criminal negligence.

The Treatment of Tuberculosis in Wartime

In previous letters the taking over of hospitals and other institutions and adapting them to the accommodation of the large number of war casualties, military and civilian, which were expected has been reported. This of course has given rise to difficulties in the treatment of the sick. Tuberculosis is a case in point. The minister of health outlined to a deputation representing the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council and the Tuberculosis Association the steps taken to ensure that tuberculous persons continue to receive treatment while an adequate reserve of beds is kept for air raid casualties. Although some patients had been discharged from sanatoriums and other insti-

tutions to provide accommodations for casualties, about two thirds of the 28,000 beds for the treatment of tuberculosis in England and Wales remained available for their peace time purpose. If by mistake some actively infectious persons had been discharged, they would be sought out and brought back for treatment. As more and more of the huttet annexes to hospitals were completed, so more and more beds at present allotted to casualties would be released. After an initial lull the dispensary services were returning to normal, and difficulties caused by a temporary transfer of personnel were being overcome. The importance of maintaining facilities for the surgical treatment of tuberculosis, both pulmonary and non-pulmonary, was fully recognized. The minister was also fully alive to the need for arrangements for the treatment of tuberculous patients in the army, navy and air force.

BERLIN

(From Our Regular Correspondent)

Nov. 11, 1939.

Curtailed Use of Boron Derivatives

The use of boron derivatives for chemical purposes has recently been curtailed. An official opinion of the state health department has been published bearing on the more economical use in medicine of these derivatives. An order prohibiting general advertising of such treatments will be soon released. Borates are more widely used as mild disinfectants and to check inflammations; according to extensive clinical experiences, very small quantities are sufficient for this purpose. In otorhinolaryngology the use of finely powdered boric acid in insufflations, as well as 2 per cent of boric acid solution, cannot be dispensed with. In pyocyanus suppuration and perichondritis, boric acid must be regarded as a superior medicament. Boron derivatives used for the eye are among the few remedies that never provoke hypersensitiveness. A boric acid ointment of 3 per cent constitutes a nonirritant, indifferent salve. (The ointment sold by druggists, according to the German pharmacopeia, contains 10 per cent.) Many surgeons and gynecologists do not like to dispense with boric acid solution for cleansing the urinary passages, while internists attach less importance to it. In obstetric practice a 3 per cent solution of boric acid is applied to the eyes of newborn infants and used for cleansing the mother's nipples after nursing. However, boiled water is said to be satisfactory. Its use varies in different gynecologic clinics, but here too substitutes for borates can perhaps be used, especially for the ointment, which is much in use. Borates have relatively little significance in internal medicine and pediatrics. Accordingly, boric acids and borates are indispensable only in relatively few therapeutic fields. Many economies can therefore be made.

Commercial Use of Mother's Milk

For years, efforts have been made to promote the availability of excess mother's milk. Regulations for the organization of collecting stations have recently been announced. Thirteen of these stations are already functioning in Germany. Large cities seem best adapted as collecting centers because of the demand as well as the possibility of securing donors for this service in connection with an existing institution, so that a daily regular supervision can be assured. Besides dealing with numerous administrative measures, the regulations deal with measures necessary to conserve the biologic value of mother's milk. Women who wish to donate their surplus milk are examined in advance for their health and the condition of nutrition. Likewise the milk itself and the health of the nurslings are regularly examined about once in four weeks. The price paid at present for mother's milk per liter (quart) amounts to from 2 to 2.50 marks (from 80 cents to a dollar). The milk when delivered at the station is at once subjected to a cooling process and examined in accordance with precise directions, bacteriologically

and chemically. If it passes the test, it is sterilized five minutes at 212 F. It is then placed at once into refrigeration and must be kept there for five hours before it can be used. Mother's milk is furnished to clinics and otherwise only on medical certification, which must state the reasons for its need. Babies after recovery of their health should not be supplied with this milk, because it is difficult of procurement. For that reason the medical prescription is valid only for two to three weeks. The selling price to private persons is at present from 5 to 6 marks (from \$2 to \$2.40) per liter.

State Commission on Cancer Control

The papers read at the scientific meeting of the state commission on cancer control were chiefly by the Austrian members of the commission. Christiani, of Vienna, discussed the relation of enzymes to cancer. He discovered that the substance in the normal serum that acts as a catalyzer on carcinomatous cells is an enzyme localized in the albuminous fraction. For this reason the assumption seems justified that the carrier of this enzyme is an albumin. Three criteria favor the enzymic nature: its thermolability, its insolubility in esters and the dependence of its effect on the hydrogen ion concentration. This substance is effective only in the hydrogen ion concentration that corresponds to the native serum. It is important that this enzyme be lacking in the carcinomatous serum. The enzymes that promote oxidation and are so necessary for the formation of a deactivation in the organism of the cancerous patient are disturbed, the ergosterol cannot undergo oxidation change and, in consequence, a deactivator is not formed. It is only through radium or roentgen irradiation that the deactivating agent can be formed in the organism of cancerous subjects. According to the speakers, direct oxidation of ergosterol by means of irradiation is involved. Three enzymes, or enzymic systems, accordingly have suffered a disturbance; the enzyme that catalyzes the carcinomatous cells, the enzymes that promote the oxidation needed to form the deactivating agent and certain dehydrases of a specific dehydrating enzymic system. This enzymic system has the function of modifying through dehydration the butyric acid that forms so that the pathologic butyric acid cholesterol ester cannot come into existence. On the question of cancer heredity Denk, of Vienna, reported that, in accordance with the data gathered by the Austrian Cancer Society, in 20 per cent of the 8,475 cases a familial connection could be proved, results which are in accord with the literature. Leb, of Graz, discussed the radiologic treatment of advanced carcinomas. In cases that seemed therapeutically hopeless, notable palliative results were achieved. Even in cases of multiple skeletal metastasis, though death could not be prevented, nevertheless in fifty-eight cases of inoperable carcinoma an improvement of the anatomic and the general condition was obtained by means of irradiation in 76 per cent. In carcinomas of the esophagus, after endo-esophageal radium and roentgen treatments the ability to swallow was improved in 62 per cent. According to Marschik, of Vienna, irradiation and surgery ought to be combined in carcinomas of the larynx. Tumors ensuing from the base of the tongue seem, he said, to cause regional metastasis sooner than those proceeding from the epiglottis. Through surgical removal of a glandular metastasis before irradiation even better results seem to be obtained. The combination of irradiation and surgery yields better and more permanent results than surgery alone. Early diagnosis is of great importance. Hofbauer, of Vienna, discussed the demarcation of surgical and radiologic indication on the basis of data of the Eiselsberg Clinic, the radiologic institute of Vienna, the radium institutes of Paris and of Stockholm and that of the literature. Carcinomas of the cheek, tongue, oral cavity, tonsils, gums and penis are to be irradiated, especially with radium; the intraperitoneal tumors are to be operated on as in the past; other types, as carcinoma of the breast, are to be operated on and subsequently irradiated. Kögl, of Utrecht, proceeding from

chemical investigations, discussed the etiology of tumors. His exceptionally careful analyses disclosed basic chemical differences between normal, benign and malignant tissues. Carcinomatous cells have lost the ability possessed by normal cells to incorporate into their structural albumin exclusively the "normal amino acids." Hueck, of Leipzig, supported by Rajewski, of Frankfurt on the Main, reported his results of pulmonary carcinomas found among the Schneeberg miners. This form of carcinoma has been legally recognized as an occupational disease. It is now assumed that the high radon content in the stone dust is the cause of this type of cancer. Mice suspended in cages in certain parts of the mines developed tumors, including malignant pulmonary tumors, quite abundantly.

STOCKHOLM

(From a Special Correspondent)

Dec. 3, 1939.

Red Cross Air Ambulance Services

Surgeon General, retired, Fritz Bauer, who has for years taken an active part in the Swedish Red Cross Society, published in a recent issue of the journal of this society an account of what it has done to promote air ambulance services since 1924, when they were first started. His is a story of pioneer work, of the expenditure of vast sums on what at times must have seemed a forlorn hope, and of disasters which have cost seven lives. The nature of air ambulance service makes this particular branch of aeronautics exceptionally dangerous; the urgent case requiring immediate operation or other treatment cannot wait till atmospheric conditions improve. In spite of often unfavorable weather, the appeals for the aid of the air ambulance service were answered in 544 of 582 cases.

Bringing his statistical information up to the end of May 1939, Surgeon General Bauer shows that, since 1924, Red Cross air ambulance services have transported 1,431 patients and have covered 402,151 kilometers. The number of patients carried may be raised to 1,543 by the inclusion of those transported by private and other airplanes. There were 218 cases of infectious disease, 480 cases of acute gastrointestinal disease, ninety-two cases of acute pneumonia, 160 cases of difficult labor or abortion and 322 accident cases transported. The fifteen cases of acute mental disease must have been the most difficult to deal with in the air. It is in the spring and autumn, when the ice is melting or beginning to form, that the difficulties are greatest in Sweden; and, when preference is shown for comparatively light machines, this is largely in deference to the thinness of the ice on which a plane may have to alight during two or three out of the twelve months in the year. Unless ice is some 20 cm. thick, a heavy airplane is apt to crash through it. The comparatively high cost of the heavier airplanes is also an important factor militating against their general use for ambulance work.

The Treatment of Dipsomaniacs

Heretofore it has been almost universally assumed that alcoholic addicts are degenerate or psychopathic individuals who are candidates for mental hospitals or special institutions. To admit such cases to a general hospital has seemed the more undesirable as they often require isolation and other special measures for which provision is made only in mental hospitals. The frequent association of alcoholism with crime has been another reason why those in charge of general hospitals have been shy of opening their doors to cases of alcoholism, acute or chronic.

The soundness of this attitude has been challenged by certain Swedish doctors, prominent among whom is Dr. J. Tillgren of the Maria Hospital, where for years the practice has been adopted of admitting cases of alcoholism on the assumption that they are just as much in need of the skilled supervision and treatment available in a general hospital as any other

case. At the Maria Hospital it is customary for acute cases of alcoholism to be discharged after about three weeks—a period so short that the patient does not miss that occupational treatment which is available in certain institutions for chronic cases.

This movement away from special homes for alcoholic addicts to general hospitals has been favored by certain shortcomings in the former. There are several such homes in Sweden with a total of about 800 beds, but in some of them there is no resident medical officer, and the visiting medical officer puts in an appearance only once or twice a month.

The Late Prof. Carl Gustaf Santesson

Professor Santesson died of coronary thrombosis July 26. His father was a Swedish professor of surgery and his mother was a sister of a Swedish professor of anatomy. Studying in Uppsala and Stockholm, Santesson in 1891 successfully defended his thesis for the degree of M.D. But at this stage in his career pharmacology enjoyed a renaissance which inspired him and made him its servant for the rest of his life. Returning from prolonged studies in Germany, Santesson taught pharmacology in Uppsala and in 1895 was appointed professor of pharmacodynamics and pharmacognosia at the Caroline Institute in Stockholm. As a research worker and as an author, Santesson was indefatigable; his publications number over 200. He was particularly interested in the action of poisons employed by primitive peoples on their arrows, and on this subject alone he published a score of studies. His modesty and kindness endeared him to many generations of medical students.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 21, 1939.

Protection of Professional Incomes During Military Service

Practitioners entering military service in Australia must suffer a reduction in their income. A modern fighting force cannot function without medical services and it is necessary also to have a proportion of experienced medical officers as well as those who have recently graduated. As the majority of these men will hold the rank of captain, at approximately £400 per annum, and experience indicates that the income of a practice rapidly diminishes in the absence of the principal, these men will be called on to make a sacrifice out of all proportion to that imposed on those who do not join the services. The council of the Victorian branch of the British Medical Association, therefore, has devised a scheme for the protection of professional incomes during military service. It provides for the establishment of an income insurance fund by means of which losses may be spread more evenly on the whole of the profession. Men who remain in civil and departmental practice and practitioners on military duty who suffer no loss of income are invited to contribute to this fund, which will be applied to rendering financial assistance to men on active service who do suffer loss of income. The proposed contributions have been equitably arranged on a percentage basis of gross professional income earned, graduated to spread the burden in accordance with ability to pay. These contributions might be regarded as premiums for insurance against a risk—loss of professional income—which it is impossible for any practitioner at this stage to know that he will not himself be called on to suffer. Membership in the fund is voluntary. Financial assistance for a member shall not exceed £500 per annum, and in no case will it be greater than an amount, with the member's military pay, to provide him with an income of more than £900 per annum.

A second part of the scheme provides for the organization of groups of members of the profession for the purpose of carrying on the practices of members of the group who may

be called up for military duty. The experience of the last war has not been forgotten, when, all too commonly, those who kept the home fires burning took the opportunity to warm themselves by the fire. This second portion of the scheme provides also that no practitioner shall commence practice in a group area without purchase for the duration of the war and six months after, that all practitioners refuse to attend for at least twelve months the patients of another practitioner who has resumed practice after military service, that all appointments held on behalf of the absentee be returned and that all appointments made during the war be only temporary and be thrown open for application at the termination of the war.

By offering their full support of these recommendations, members of the British Medical Association in Victoria will fulfil one of its first objects: "the maintenance of the honor and interests of the profession."

The Walter and Eliza Hall Institute of Research

A great deal of the original research which is making Australian workers known overseas has come from the Walter and Eliza Hall Institute of Research in Pathology and Medicine, which has published its twentieth annual report. The trustees of the late Walter and Eliza Hall completed the pathologic block of the Royal Melbourne Hospital and provided a sum of £2,500 annually toward the upkeep of the institute. Since 1930 this sum has been £3,200 a year. The work of the institute is undertaken under conditions which are at once an advantage and a disadvantage. The routine services of the Royal Melbourne Hospital in bacteriology and pathology are carried out at the institute, and work of this kind must be a distraction to the director and certain of his co-workers, but it does bring the hospital, as it were, into the institute, and this close association cannot fail to be a stimulus to the members of the honorary staff. Pride of place is given in the report to the work of Dr. F. M. Burnet and other members of the virus department. This department has been financed by annual grants of £1,000 from the Rockefeller Foundation and of the same amount from the commonwealth department of health. Among the conditions investigated during the past twelve months have been poliomyelitis, herpes, influenza, Q fever, psittacosis and myxomatosis. In the department of physiology work has been done by Dr. W. Feldberg, Dr. E. R. Tretliewie and the director (Dr. C. H. Kellaway) on tissue injury by snake venom, staphylococcus toxin, mercury bichloride, radiant energy, anesthetics and anaphylaxis. In all, thirty important papers have been published, and it need hardly be stated that the published papers do not represent all the work that has been proceeding at the institute. The financial statement shows that this work has all been carried out for the modest sum of £5,399.

Marriages

ANGUS MORRIS McDONALD JR., Charlotte, N. C., to Miss Mary Letty Mebane, of Greensboro, in October.

JOHN AUSTIN RYAN, Milan, Mich., to Miss Alma Lloyd Ranson, at Durham, N. C., November 4.

J. THOMAS MILLINGTON JR., Wilkes-Barre, Pa., to Roberta Walton, of Kingston, October 15.

JOHN N. McCANN to Miss Mary Louise Radowick, both of Youngstown, Ohio, October 16.

PAUL RUSSELL GRIFFITH to Miss Ida Louise McCoy, both of Berwyn, Ill., November 4.

SAMUEL KENNETH GERSON, Cleveland, to Miss Jean Long, at Canton, Ohio, October 25.

VINCENT J. GAUL, Chicago, to Miss Ruth Wigent, of Fort Wayne, Ind., in October.

Deaths

Amédée Granger ☉ New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1901; professor of radiology, Louisiana State University Medical Center; professor of radiology at the Tulane University Graduate School of Medicine, 1916-1931; chief of service of radiology, Charity Hospital, 1905-1921, and director of the department since 1921; veteran of the Spanish-American War; member and vice president in 1929 of the Radiological Society of North America; member of the American College of Radiology and chancellor, 1923-1926; member of the French-Speaking Doctors of North America and in 1934 vice president; past president of the Louisiana State Society of Radiology and the Orleans Parish Medical Society; member of the American Roentgen Ray Society; was decorated by the French, Belgian and Italian governments for his work on x-ray; in 1926 was awarded the gold medal of the Radiological Society of North America; author of "Radiologic Atlas of the Pathological Changes of Bones and Joints" published in 1911; aged 60; died, December 15.

William H. Washburn, Milwaukee; Rush Medical College, Chicago, 1877; member of the State Medical Society of Wisconsin; secretary of the Section on Practice of Medicine of the American Medical Association in 1894; past president of the Medical Society of Milwaukee County and the Milwaukee Academy of Medicine; professor of medicine emeritus at Marquette University School of Medicine; served at various times and in various capacities on the staffs of the Johnston Emergency Hospital, St. Joseph's Hospital, County Hospital and Milwaukee General Hospital; member of the medical advisory board during the World War; aged 85; died, October 4, of myocarditis.

Thomas John Scanlan ☉ Boston; Tufts College Medical School, Boston, 1903; member of the New England Obstetrical and Gynecological Society; served during the World War; chairman of the board of trustees of the Boston State Hospital; served in various capacities and at various times on the staffs of the Foxboro (Mass.) State Hospital, Boston Dispensary, Deer Island Hospital, St. Elizabeth's Hospital and the Winthrop (Mass.) Community Hospital; aged 67; died, October 18, at his home in West Roxbury.

Joseph Lee Kirby-Smith ☉ Jacksonville, Fla.; University of the South Medical Department, Sewanee, Tenn., 1906; first lieutenant and acting assistant surgeon in the U. S. Public Health Service during the World War; on the staffs of St. Luke's Hospital, St. Vincent's Hospital and Duval County Hospital, Jacksonville, and the Flagler Hospital, St. Augustine; past president of the Florida Society of Dermatology and Syphilology; aged 57; died, November 5.

George Edward Decker ☉ Davenport, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; fellow of the American College of Surgeons; at one time president and medical director of the Register Life Insurance Company; at one time member of the state boards of health and medical examiners; formerly member of the school board; formerly on the staff of St. Luke's Hospital; aged 66; died, November 3, in the Holmes Hospital, Cincinnati.

Edward M. D. Libby ☉ Iron River, Mich.; Rush Medical College, Chicago, 1898; fellow of the American College of Surgeons; past president of the Upper Peninsula Medical Society and the Dickinson-Iron Counties Medical Society; member of the school board for many years; aged 62; died, November 10, in the Iron Mountain (Mich.) General Hospital of injuries received in an automobile accident.

Louis Schneider Weaver ☉ York, Pa.; Johns Hopkins University School of Medicine, Baltimore, 1904; member of the American Roentgen Ray Society; fellow of the American College of Surgeons; veteran of the Spanish-American and World wars; trustee of the Gettysburg (Pa.) College; surgeon to the York Hospital; aged 62; died, October 1.

William Richardson Culbertson, Coeburn, Va.; Baltimore University School of Medicine, 1904; served during the World War; formerly health officer of Wise County; part owner of the Coeburn Hospital; aged 60; died, November 6, at the New Altamont Hospital, Christiansburg, of pneumonia as the result of injuries received in an automobile accident.

Frances Culbreth Van Gasken, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; formerly

professor of clinical medicine at her alma mater; on the consulting staff of the Woman's Hospital; aged 79; died, October 24, at Drexel Hill.

Roscoe Addison Mitchell, Marshall, Ill.; State College of Physicians and Surgeons, Indianapolis, 1907; member of the Illinois State Medical Society; for many years bank president; served during the World War; aged 60; died, November 12, at the Paris (Ill.) Hospital as the result of a cerebral hemorrhage.

Corbett Edward Tumlin * Miami, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1915; member and past president of the state board of medical examiners; on the staffs of the Jackson Memorial Hospital, Riverside Hospital and Victoria Hospital; aged 46; died, November 6.

Joseph Peter Weyrens, Scottsbluff, Neb.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; member of the Nebraska State Medical Association; formerly county physician and chairman of the county medical advisory board; aged 62; died, October 7, of leukemia.

William Boswell Small, Waterloo, Iowa; Chicago Medical College, 1890; member and past president of the Iowa State Medical Society; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association 1917-1920; aged 77; died, October 9.

Charles Edward O'Connor, Kingston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1898; associate professor of ophthalmology and otolaryngology at his alma mater; on the staff of the Hotel Dieu Hospital; aged 65; died, November 7, in St. Michael's Hospital.

Clarence Eugene De Groot, Muskogee, Okla.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1904; member of the Oklahoma State Medical Association; past president of the Muskogee County Medical Society; federal jail physician; aged 60; died, October 26.

Nicholas Thomas Grace, Brooklyn; Long Island College Hospital, Brooklyn, 1931; member of the Medical Society of the State of New York; on the staffs of St. Mary's Hospital, Brooklyn Hospital and the Long Island College Hospital; aged 33; died, November 9.

Ernest M. Haggard, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1894; on the consulting staff of the City Hospital; on the visiting staff of the Methodist, St. Francis and St. Vincent's hospitals; aged 77; died, November 7, of cerebral hemorrhage.

Lewis Nostrand Anderson, Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; member of the Medical Society of the State of New York; on the staff of St. John's Hospital; aged 67; died, November 10.

Clarence Dale Fulkerson, French Lick, Ind.; Medical College of Indiana, Indianapolis, 1898; member of the Indiana State Medical Association; served during the World War; aged 68; died, November 4, in the Veterans Administration Facility, Hines, Ill.

Richard H. Simpson, Dallas, Texas; Arkansas Industrial University Medical Department, Little Rock, 1887; Kentucky School of Medicine, Louisville, 1899; member of the State Medical Association of Texas; aged 77; died, October 29, of chronic nephritis.

Burt Edward Scott, Berlin, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1901; member of the State Medical Society of Wisconsin; served during the World War; on the staff of the Berlin Memorial Hospital; aged 67; died, October 2.

Charles Rohrer Kiser * Madison, Ill.; Medical College of Ohio, Cincinnati, 1895; past president of the Madison County Medical Society; aged 72; died, November 5, in a hospital at Hamilton, Ont., of a skull fracture received in an automobile accident.

Theodore Miller * Cleveland; Harvard Medical School, Boston, 1908; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital; aged 55; died, November 7.

David Leonard Hedberg, Evanston, Ill.; Northwestern University Medical School, Chicago, 1909; served during the World War; at one time police surgeon; aged 61; died, November 19, in the Veterans Administration Facility, Dearborn.

Wiley S. May, Little Rock, Ark.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893; College of Physicians and Surgeons, Little Rock, 1908; Kansas City (Mo.) College of Medicine and Surgery, 1920; aged 68; died, November 3.

Christopher C. Threlkel, Morgantown, Ky.; University of Tennessee Medical Department, Nashville, 1898; member of the Kentucky State Medical Association; for many years county health officer; aged 66; died, November 9.

Francis Owington Rogers, Little Rock, Ark.; University of Maryland School of Medicine, Baltimore, 1901; member of the Arkansas Medical Society; aged 63; died, November 8, in the Lynnhurst Sanitarium, Oakville, Tenn.

Herbert Elmer Stevenson, El Paso, Texas; Rush Medical College, Chicago, 1899; member of the State Medical Association of Texas; veteran of the Spanish-American and World wars; aged 68; died, November 2.

Joseph James McNamara, Rochester, N. Y.; Fordham University School of Medicine, New York, 1917; member of the Medical Society of the State of New York; aged 47; hanged himself, October 1.

Irving Joseph Weiss, Callender, Iowa; Creighton University School of Medicine, Omaha, 1931; member of the Iowa State Medical Society; aged 33; died, October 17, of acute myelogenous leukemia.

David M. Brower, Ashland, Ore.; Willamette University Medical Department, Salem, 1888; past president of the Jackson County Medical Society; aged 81; died, October 27, of cerebral hemorrhage.

Homer Chambliss, Cairo, Ill.; Meharry Medical College, Nashville, Tenn., 1924; member of the Illinois State Medical Society; aged 40; died, November 8, in the Passavant Hospital, Chicago.

Clinton Hill Morgan, Knoxville, Tenn.; University of Tennessee Medical Department, Nashville, 1899; member of the Tennessee State Medical Association; aged 64; died, November 11.

Frederick William Winter, Adams, Neb.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1880; aged 87; died, November 12, in Lincoln of prostatic hypertrophy.

Roy Ulysses Stevens * Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, Kan., 1921; aged 48; died, October 30, in Excelsior Springs of carbon monoxide poisoning.

George W. Lamb, Philadelphia; University of the South Medical Department, Sewanee, Tenn., 1898; also a clergyman; aged 64; died, October 30, at the Episcopal Hospital of heart disease.

Edgar M. Harris, New Haven, Mich.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; at one time health officer; aged 64; died, November 7, of diabetes mellitus.

Sarah Shomer, Miami, Fla.; University of Michigan Medical School, Ann Arbor, 1931; aged 43; died, October 7, in the St. Francis Hospital, Miami Beach, of septicemia.

Oliver James Roskoten * Peoria, Ill.; Rush Medical College, Chicago, 1882; an Affiliate Fellow of the American Medical Association; aged 81; died, November 5.

Earl E. Efner, Oroville, Wash.; Sioux City (Iowa) College of Medicine, 1901; member of the Washington State Medical Association; aged 64; died, October 6.

Thomas W. Taylor, West Point, Ga.; University of Georgia Medical Department, Augusta, 1892; aged 74; died, November 1, in the City-County Hospital, La Grange.

Andrew Tennyson Custer, Indianapolis; Indiana University School of Medicine, Indianapolis, 1908; served during the World War; aged 66; died, November 11.

John Nicoll Dimon, New London, Conn.; Long Island College Hospital, Brooklyn, 1883; aged 77; died, October 10, of chronic myocarditis and arteriosclerosis.

Charles T. Walton, Port Henry, N. Y.; Albany Medical College, 1886; aged 80; died, October 31, of influenza, hypostatic pneumonia and multiple arthritis.

Frank Shapiro, New York; Long Island College Hospital, Brooklyn, 1915; member of the Medical Society of the State of New York; aged 52; died, October 27.

George Leslie Lyne, Medina, Ohio; Dartmouth Medical School, Hanover, N. H., 1896; aged 71; died, November 10, of arteriosclerosis.

Ulric Antonio Bedard, Kankakee, Ill.; Rush Medical College, Chicago, 1894; aged 73; died, November 11, of coronary thrombosis.

Bureau of Investigation

A "DIABETES CURE" FRAUD

"Dia-San" Concern Debarred from the Mails

A "diabetes cure" put out under a number of names and claimed to be "a formula of herbs used in Germany's great hospitals" has been debarred from the mails by the issuance of a fraud order against the Dia-San Laboratories, Inc., Dia-San Corporation and Albert Hofmann, president, of Fort Wayne, Ind.

The "cure" was sold under such designations as "Hofmann's Medicinal Natural Herb Tea," "Dia-San," "Dia-San Diuretic R 212," "Dia-San Herb Tea 212" and "Original Old Country Dia-San R 212." The Post Office Department reported that the business was started in 1930 and that though the concern's titles and literature indicated that it was incorporated, Hofmann informed that department that it was not, and that he was the sole owner of the enterprise.

Many of those who inquired of Hofmann about the treatment received a form letter reading in part:

A few years ago some nationally known chemists of Germany prepared a combination of herbs found in that country and in Eastern Europe for the treatment of Kidney and Bladder troubles. This preparation grew into such favor that most of the great health centers of Europe are now using it.

The formula has been obtained and the herbs are imported at present and the preparation is now available in the form of DIA-SAN DIURETIC R 212. This was formerly called Original Old Country Herb Tea R 212.

DIA-SAN contains beneficial Herbs, the extract of which is in constant use by physicians and hospitals. This particular combination of herbs, blended to soothe irritated mucous membranes, gives us a formula that may be used with great benefit in DIABETES, RHEUMATISM, BRIGHT'S DISEASE . . . Kidney and Bladder disorder, Backache, Headache, Leg Pains—Swelling, Dizziness or Defective Vision, yield quickly to the DIA-SAN Treatment. . . . We make no false claims for DIA-SAN. It will do just what we say it will. We desire to help you and convince you that famous DIA-SAN is a wonderful remedy. . . .

And finally, in a booklet:

Like harmony in music, so, blended is the flavor in our remedy. DIA-SAN contains medicinal power as well, and is very beneficial to the user. It is a New Discovery in the art of preparing, blending and combining herbs for taste as well as usefulness. . . . The Herbs are imported from Germany and carefully compounded to make a palatable diuretic.

The booklet represents that the product is good not only for "diseases of the urinary organs" but also for "diseases of the prostate," "dropsical and renal disease," "gonorrhea" and "heart diseases." Of course there are the usual testimonials.

Microscopic analysis of the stuff by government chemists is said to have shown that it consisted of the leaves of buchu, bearberry and mint, stems of horsetail herb, anise seed, licorice root, beans, corn silk, wintergreen, and traces of other herbs not named.

Hon. Vincent M. Miles, Solicitor for the Post Office Department, in his memorandum recommending that the Postmaster General debar the thing from the mails as a fraud, cited medical evidence that, while the mixture when used as directed would be slightly laxative and by irritating the kidneys might slightly increase the flow of urine, such increase would have no valuable effect in removing the various poisons from the blood stream; that it would have no beneficial action on diabetes and that gout, rheumatism, neuritis and prostatitis arise from various causes such as venereal diseases and foci of infections, all of which would be affected by this nostrum; and that there is no known drug or combination of drugs that will be effective in all cases of high blood pressure, kidney and bladder troubles, disorders of the prostate gland, dropsical and renal diseases, gonorrhea, and heart trouble. Nevertheless the Dia-San treatment was represented to cure or benefit all such conditions and to enable the victims of them to regain and retain "lasting" good health.

The memorandum also brought out that Mr. Hofmann was born in Germany forty-five years ago, came to America in 1923 and took out first papers for citizenship but never proceeded further; that in addition to his nostrum business he works as

a knitter in a knitting plant in Fort Wayne, and that neither he nor any one else connected with his nostrum business possesses any medical knowledge. In addition, Judge Miles's memorandum referred to a case in which *Alfred Hofmann*, trading as the Original Old Country Remedy Co., was prosecuted in 1934 under the Food and Drugs Act for selling his "Old Country Dia-San" in interstate commerce under fraudulent claims. The defendant (presumably the *Albert Hofmann* mentioned in the fraud order) pleaded guilty but, also pleading poverty, was fined the ridiculously small sum of 5 cents!

In the Post Office investigation Hofmann claimed that the cited misrepresentations for his product had been discontinued a long time ago, but the government presented evidence that even "within recent months" Hofmann had sent out literature soliciting the purchase through the mails of the treatment for the diseases mentioned. Accordingly, a fraud order was issued on May 8, 1939, covering the names Dia-San Laboratories, Dia-San Laboratories, Inc., Dia-San Corporation, Albert A. Hofmann and Albert Hofmann, President.

A "GOITER CURE" FRAUD FROM MONTREAL

Lemmert Nostrum Debarred from United States Mails

A Canadian "goiter cure" advertised in periodicals in this country has been barred from the United States Mails by the issuance of a fraud order against a Mrs. Emma Lemert (or Lemmert) of Montreal.

The memorandum on the case issued by Hon. Vincent M. Miles, Solicitor for the Post Office Department, quoted a typical advertisement:

GOITRE
"External Treatment. Will bring prompt relief. Many testimonials Free Booklet.

EMMA LEMMERT REG. Box 734, Montreal, Canada."

Many of those who answered it received a printed letter reading:

Dear Sir or Madam:

We take pleasure in sending you our booklet concerning goitre. Read it carefully, it will interest you. You will find in it copies of a few certificates from persons who have been cured with our treatment.

This goitre cure will not only remove the tumor, but all symptoms which affect goitre sufferers will also disappear. It will be impossible for anyone to detect that you ever suffered with goitre.

We hope that you will be convinced that our treatment can do for you what it has done for so many others, and that we will soon be able to put your name on our list of patients whom we have cured.

When ordering, please fill the questionnaire enclosed herein.

The booklet mentioned was a small six-page leaflet in which Mrs. Emma Lemert used a supplementary title, "Mde. Marie Girardin," and claimed "Over 25 years of success" with "this wonderful goitre cure," which she also described as "an external treatment so everyone may use it, without any fear of bad effects . . . it has cured the worst cases . . . quite different of all the other treatments . . . since 1914, when this treatment was offered to the public, hundreds of people of all parts of America were cured with that remedy . . . Mrs. Lemert's Treatment will not only remove the tumor, but all symptoms which affect goitre sufferers will also disappear (such as Protruding Eyes, Heart's Palpitations, Nervosity, Etc.) after using this wonderful treatment."

There were testimonials, alleged to have come from persons claiming to have used the preparation and to have been completely cured of various types of goiter.

The treatment was sent out in small metal boxes, each full box containing about one ounce, to be used daily. Users were directed to apply it at bedtime after washing the throat with lukewarm water, then massage the throat and finally apply the ointment, which, covered with cotton, was to be left on over night, and part of the next day if possible.

Chemical analysis of the ointment was reported to reveal that it consisted of a sulfonated bitumen (ichthammol) in a lanolin base. Iodine or alkaloids were not detected.

Judge Miles's memorandum cited the medical evidence in the case as showing that in some simple colloidal goiters iodine may be helpful, whereas iodine was not found in the Lemert "cure." The evidence further showed that large adult goiters or other tumors of the thyroid gland, regardless of type, are never removed by external application of medicines or, in fact, by any other means than surgery, radium or the roentgen ray. The memorandum pointed out that many tumors at the side of the neck may be malignant and frequently cancerous and that the delay caused by the use of Mrs. Lemert's nostrum might prevent the patient from obtaining proper treatment and even result in death.

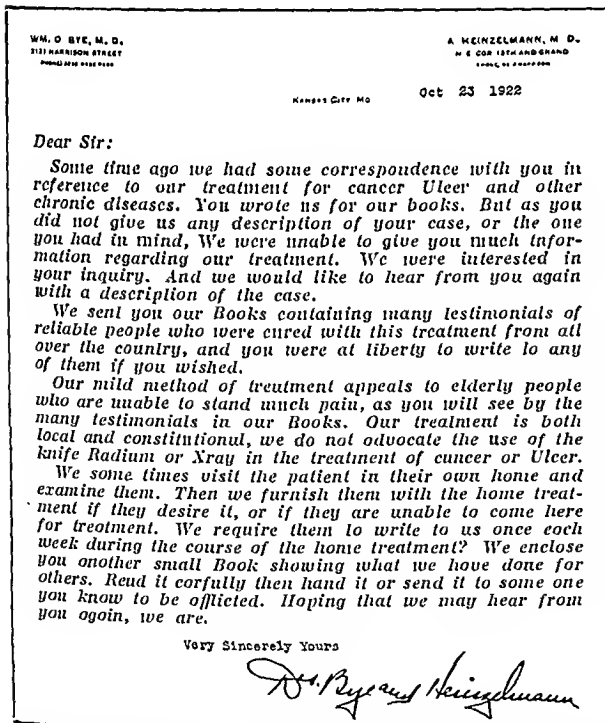
On April 3, 1939, the United States mails were closed to this Canadian fraud.

A "SYPHILIS CURE" FRAUD

Heinzelmann Company of Kansas City Is Banned from Mails

The sordid story of a "cancer specialist" who also promoted a "syphilis cure" is revealed in a fraud order by which the Post Office Department has debarred the Heinzelmann Company, of Kansas City, Mo., from the use of the mails.

This enterprise was started in 1924 by an Arthur Heinzelmann, who obtained a medical degree in 1907 from the Eclectic Medical University, of Kansas City, a low-grade school long since closed. Previously Heinzelmann's name had appeared as "superintendent" on the letterhead of the Cliff View Sanatorium of Kansas City, a "cancer cure" institution. Later he joined a William O. Bye of unsavory repute in another Kansas City cancer cure scheme. This combination and the nature of the business are best illustrated by the following letter sent in 1922 to an inquirer, who forwarded it to the Bureau of Investigation:



Reproduction of letterhead and signature (reduced); body of letter reset in type.

Further details of the Heinzelmann-Bye business appeared in a report which the Bureau of Investigation published in *THE JOURNAL*, June 3, 1933.

Not content with limiting his nefarious activities to the cancer cure field, this individual started his syphilis cure fraud in 1924. The latter enterprise was called the Heinzelmann Company and sold through the mails a nostrum called "Dr. Heinzelmann's Remedy."

The first government agency to concern itself with this scheme was the Federal Trade Commission. On Dec. 26, 1937, the Commission announced that it had got Frances M. Heinzelmann and Etta Campbell, trading as the Heinzelmann Company, Kansas City, to sign a stipulation promising to cease representing that "Dr. Heinzelmann's Remedy," also known as "Blood Disease Formula," can be used by the sufferer at home with beneficial results regardless of the cause of the ailment or the length of time it has existed. *The defendants were reported as admitting that there is no blood disease for which their product could be considered a satisfactory remedy.*

Two years later, in the memorandum of Hon. W. E. Kelly, Acting Solicitor for the Post Office Department, recommending that the United States Postmaster issue a fraud order against the business, it is reported that after Heinzelmann died in April 1936 the scheme was continued by his widow, Mrs. Frances M. Heinzelmann, with the aid of a physician, not named, until September 1936, when Mrs. Etta Campbell became a silent partner.

The memorandum states further that after an investigation of the enterprise by a Post Office inspector the concern was called on to show cause why a fraud order should not be issued against it for selling its product through the mails under the false and fraudulent representations that it would "free" victims of syphilis, of that "terrible disease" and prevent locomotor ataxia, organic heart disease, paresis, blindness, the birth of syphilitic children and other afflictions and conditions incident thereto. No fraud order was issued at that time, however, because certain statements made by Mrs. Heinzelmann and other evidence indicated that the preparation was not being sold through the mails for the treatment of syphilis.

These statements and "other evidence," however, must have been spurious or at least misleading, for it was found later that letters urging the purchase of additional medicine were addressed by the promoters of the scheme to customers who had previously purchased the remedy as a syphilis cure. The later evidence showed, in fact, that the promoters were "continuing" to offer to sell the cure through the mails as a treatment for "bad blood" resulting from syphilis, anemia, malaria, pellagra, gonorrhea, tuberculosis and some other conditions. All this in spite of the fact that two years previously Mrs. Heinzelmann had admitted to the Federal Trade Commission that the product was good for nothing.

Analysis by government chemists was said to show that the Heinzelmann nostrum was composed of sodium iodide, alcohol, sugar and plant extractives, including bitter principles, tannins and saponins. Expert medical evidence was produced to show that the term "bad blood" is frequently used by laymen to describe a condition resulting from any number of diseases, including syphilis, pellagra, gonorrhea, tuberculosis and anemia, but that "purifying" such "bad blood" requires treatment of the cause thereof, a procedure which necessitates careful diagnoses based on examination of the patient in person and in some cases on laboratory tests. Moreover, it was pointed out that, on arriving at a diagnosis, the physician must adapt his treatment not only to the special disease found to be present but also to the stage to which it has progressed and to the patient's individual needs.

The medical evidence further showed that, despite use of the Heinzelmann treatment by persons afflicted with syphilis, the blood and spinal fluid tests would remain positive and the condition would progress, with paresis and locomotor ataxia as possible after-effects. Also the evidence showed that the Heinzelmann treatment was not in itself a competent treatment for the other conditions in which it was supposed to "purify" "bad blood." Mrs. Heinzelmann denied that her "remedy" was sold for these conditions mentioned and claimed that it was promoted only for its "tonic properties"; and, further, that the business was "decreasing rapidly." These statements were contradicted by evidence which, Judge Kelly declared, showed that the business was a scheme for obtaining money through the mails under false and fraudulent pretenses and promises. Accordingly a fraud order was issued against it on April 1, 1939.

Correspondence

GLAUCOMA: A MEDICAL PROBLEM

To the Editor:—In civilized countries glaucoma takes first place among the causes of blindness. De Grosz says that more blindness results from this disease than from syphilis, tuberculosis, gonorrhea or even injuries. Yet there is no subject affecting the eyes which is less understood or for the prevention of which less is being done. The communication in THE JOURNAL Nov. 26, 1938, asking whether the views of Magitot on the origin of glaucoma were generally accepted was important.

Magitot is one of the most eminent French ophthalmologists. He was one of four reporters on glaucoma at the thirteenth Ophthalmologic Congress, the Netherlands, 1929, and the summary of the views he expressed was embodied in papers through four succeeding numbers of the *Annales d'oculistique*. These views were not generally accepted by the medical profession. One reason why they are not more widely accepted is that they are not generally understood. Magitot, writing in French, is not accessible to the majority of English readers. While he has been the guest of great medical societies in this country, his writings usually appear in French periodicals. These are not commonly read by American physicians, and abstracts are inadequate to give their full import. Beard's translation was a valuable addition to our knowledge of this subject.

The accepted view by ophthalmologists is that glaucoma is a disease characterized by increased tension of the eyeball, that this is produced by a narrowing or closure of the pathways of exit of the fluids from the anterior part of the eye and that, failing reduction of this tension by the use of myotics and more especially pilocarpine, an operative procedure relieving this tension is the only means of relief.

Magitot and a growing number of writers are accepting the view that the closure of the anterior pathways is due to an increase in the amount of the intra-ocular fluids and is a consequence rather than a cause of the disastrous series of events which follow.

A theory is only of academic value unless it has a practical application. Acceptance of the view that the obstruction is mechanical and can be relieved only by mechanical measures not only shuts off the consideration of other means of relief but also closes the mind to the acceptance of possible causative conditions which might be governable.

The importance of an understanding of this matter far transcends the acceptance or the rejection of a theory. Some of these points Magitot has elaborated in the first number of the *Acta ophthalmologica* of the current year in a paper of some seventy pages. Whether this view is correct or not, it opens a wide field for further research and the adoption of other clinical measures before the period has arrived in which operative measures become imperative. The prodromal symptoms often extend through a period of years and it is their early recognition which is important. When accommodation becomes uncertain, when it is difficult to see after dark, when there are occasional phosphenes before the eyes and temporary clouding, all these may indicate transitory intra-ocular pressure. These are known to be increased by emotions, by excesses, by physical disturbances, by focal infections and by other controllable causes. These and other symptoms are frequently overlooked even in our best clinics, and are not adequately emphasized in most of our textbooks, during a time in which relief is possible. It is during this period that treatment can be most effectively applied, and it is then that it is most commonly overlooked. It is unquestionably necessary that every glaucomatous eye should be subject to constant supervision by one adequately trained to measure the tension, to take visual fields and to study eyegrounds. But

this should be carried out in closest cooperation with the internist, who takes into account such general physical changes as may be found to be present.

As Edward Jackson has well put it, "The common belief that glaucoma means either operation or blindness is not correct. We must admit there is something besides operation that can cure glaucoma. To determine what this something is, is a proper subject for investigation and experiment." But the unnecessary eye mortality due to glaucoma will not be limited until the public and the medical profession at large are taught to recognize the early symptoms of the oncoming of glaucoma before pathologic changes occur and while there is still a possibility of saving the sight.

PARK LEWIS, M.D., Buffalo.

THE HIPPOCRATIC OATH

To the Editor:—I was surprised to read the editorial "A New Interpretation of a Paragraph in the Hippocratic Oath" in THE JOURNAL November 4. The "new interpretation" is meaningless and not in accord with the spirit of the rest of the oath. It vitiates one of the most important paragraphs in the entire oath.

The scholar who suggests this interpretation is more of an etymologist, lexicographer and perhaps syntaxologist than a philologist. Yet I suspect that he will receive a vote of appreciation from practitioners who are "cutting persons suffering from a stone" instead of "leaving it to practitioners of that art," because this "interpretation" would put a final quietus on their conscience for doing so.

It is a well recognized fact that words denote, connote and have a figurative meaning. Sometimes a word is used for one of these reasons, sometimes for another, and taken in the context may have very different meanings. "Cut up" in a salad recipe means to reduce to fine particles. "Cut up" also means capricious behavior. The word "cut" is often used to signify a surgical operation, and in the Cow County, from the Rio Grande to Canada, the word "cut," when referring to an animal, means to castrate. One who carries out a surgical procedure is known as an operator. The proprietor of a pool hall is called an operator. An agent of the Federal Bureau of Investigation is called an operator. Some post-meta-scholar, two thousand years from now, might say that in the United States of today the secret police performed surgical procedures and were proprietors of pool halls.

In "interpreting" a word when several alternatives are possible, one must be guided by the spirit and general meaning of the entire manuscript. This is a well recognized principle in law. Applying this to the paragraph in question, one must first get the spirit of the "oath." "I will teach medicine to those who are properly qualified and to none others." "I will use that treatment which is for the benefit of the patient . . . and refrain from voluntary acts of mischief and corruption." "I will not give a woman an instrument with which to produce an abortion." In no place does it say I will not associate with unqualified students, quacks, charlatans and abortionists, all of which I will not do, but "with purity and holiness I will live and practice my art."

In this paragraph in the oath, granted that the word in question means to castrate and that only, if Hippocrates did not approve of castration while operating for a stone this part of the paragraph would mean "I will not castrate a person while removing a stone." But if this is considered in connection with the latter part of the sentence "but will leave it to practitioners of that art," it is clear that Hippocrates must have used the word in a figurative sense or, since and if such mutilation was a common practice, he used it because it was common but as an example to make plain an important and thoroughly hippocratic ethical principle: if I am to treat for the benefit of the patient, abstain from voluntary acts of mischief, live and prac-

tice in purity and holiness, honored by all men. That principle is "I will not attempt procedures which I am not qualified to perform but will leave them to those who are qualified." If medical men today would make that paragraph a part of their daily work, they as individuals and the medical profession as a whole would be more honored by all men, and some patients would not be hurried to their graves because medical men did not leave to practitioners procedures which they themselves were not qualified to carry out.

All the scholars who have translated the oath from the time of Hippocrates have not been mistaken. I hope that the "new interpretation" never finds its way into the official printed oath.

L. A. TURLEY, PH.D., Oklahoma City.

Professor of Pathology and Lecturer
on History of Medicine, University
of Oklahoma School of Medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LEAD AND ARSENIC IN TOBACCO

To the Editor:—In the annual cumulative issue of *Consumer's Research Bulletin* for Sept. 4, 1939, the statement was made that the lead content of five brands of cigaret was found to vary from 11 to 30 parts per million and that the arsenic content varied from 6 to 14 parts per million. The brands tested were Camels, Lucky Strikes, Pall Mall, Murad and Lord Salisbury. Are these ranges of values for arsenic and lead too high for safety for one who smokes one packet of cigarets daily? Are these values correct ones and if not what are correct values?

M.D., Pennsylvania.

ANSWER.—In a recent article two Canadian investigators (Zeidler, F. A. J., and Wagner, W. J.: The Lead and Arsenic Content of Canadian Domestic Tobaccos, *Canad. Pub. Health J.* 28:582 [Dec.] 1937) reported an average of 22 parts per million of lead to the package of domestic cigarets. Nine analyses of oriental tobaccos showed an average lead content of 2.5 parts per million to a package. The arsenic content of these tobaccos was not determined but the authors estimate that it may amount to about one half of the lead content, or 11 parts per million per package of domestic tobaccos. These amounts of lead and arsenic in tobacco are attributed chiefly to the lead arsenate used as an insecticide for the horn worm, the wire worm and the flea beetle. Some tobacco leaves contain 100 times the lead tolerance placed by the United States government on foods. This varies from year to year and place to place depending on the requirements for insecticide. Although tobacco is an agricultural product, the restrictions placed on foods have not been applied to tobacco with comparatively high contents of lead and arsenic.

Lead and arsenic may enter the system during smoking by inhalation and by ingestion secondary to solution in the saliva and mucus. It has recently been shown that saliva dissolves five times as much lead arsenate as blood serum. The actual amount of lead and arsenic dissolved in saliva and swallowed during smoking is not known.

Some investigators have reported on the amounts of lead and arsenic volatilized from tobacco during smoking. Gross and Nelson (Arsenic in Tobacco Smoke, *Am. J. Pub. Health* 24:36 [Jan.] 1934) found that the average arsenic content of unnamed American brands was 114 parts per million to the package. A little more than one third of the arsenic was volatilized during smoking but only 10 per cent was found in the puffed smoke. A considerable portion of the arsenic remains in the unburned tobacco, is volatilized in the unpuffed smoke and is absorbed by the tobacco in the butt. It has been computed that one fifteenth of the total lead present in cigarets is found in the puffed smoke.

How much lead and arsenic constitutes a daily toxic dose is a controversial question. It is a complicated problem. The safe limit of lead in air breathed has been set by the United States Public Health Service and the National Safety Council as between 150 and 600 micrograms per cubic meter of air. The oral daily toxic dose of lead as given in the literature varies from 100 to 1,000 micrograms. The lead tolerance placed on

foods by the United States government is about 2.5 parts per million and the arsenic tolerance is 1.06 parts per million, both expressed as the elements. If one fifteenth of the lead and arsenic is inhaled in the smoke of one cigaret and the tobacco contains 22 parts per million of lead and 11 parts per million of arsenic, and an average package of cigarets contains 21 Gm. of such tobacco, the lead inhaled as an oxide will amount to 70 micrograms and the arsenic roughly to 35 micrograms. This value for lead is approximately one half of the lower limit established by the United States Public Health Service for lead in air. These approximate calculations may indicate the desirability of further study of the lead content of the air in rooms filled with tobacco smoke. How much lead or arsenic is actually taken into the body, retained and excreted on exposure to tobacco smoke containing lead and arsenic has not been determined. It is not likely that one could obtain a toxic dose of lead or arsenic from smoking one package or even several packages of cigarets daily; but because these toxic elements are cumulative, the possibility of the relationship of tobacco to poisoning with such heavy metals should not be overlooked.

WARTS AND MILKWEED

To the Editor:—I have been informed by several patients that the fluid which can be expressed from the stems and leaves of the milkweed has a curative effect when applied to verruca, or the common household variety of warts. I have seen this work to perfection in one case. Is there any known substance found in the milkweed or elsewhere which has this therapeutic property? In the case mentioned eight applications on alternate days caused the wart to disappear.

Oscar J. Hurak, M.D., Galetton, Pa.

ANSWER.—It is not likely that noncauterizing local applications have any direct effect on warts. In spite of the recent discovery at the University of California that milkweed juice contains a proteolytic enzyme, it seems unlikely that it can penetrate the horny armor of a wart. Until new light has been shed on this question it must be held that the milkweed juice treatment of warts remains in the controversial field discussed in answer to a query in *THE JOURNAL* Jan. 18, 1936, page 235. The skeptic claims that these cures are mere coincidences. The warts heal spontaneously at the proper time to give credit to the milkweed juice. The believers maintain that the spontaneous disappearance of warts does not occur with anything like the frequency with which cures by psychotherapy are effected by those who are adept at this treatment.

Dermatology waits with eager anticipation for the discovery of something in milkweed juice or elsewhere that will cure warts with certainty and without scarring.

CRANIAL NERVES AND CEREBROSPINAL SYPHILIS— ADIE'S SYNDROME

To the Editor:—In the course of my practice I have examined several patients who present signs which I have been taught are suggestive of siphylis of the central nervous system. Some have a history of previous siphylitic infection, others do not but admit likelihood of exposure. These signs are usually those of involvement of the cranial nerves, as evidenced by sluggish or fixed pupils, smooth forehead with inability to control "wrinkling," facial tremor and inability to control facial muscles, with perhaps some difficulty in repeating test phrases, and the like. I have made it a routine practice in these cases to obtain a spinal fluid examination, which is frequently entirely negative. I am convinced that these patients have some siphylitic involvement and am at a loss to account for the infrequency of corroboration in the spinal fluid. The blood Kahn reaction is sometimes positive and sometimes negative. These experiences have given rise to several questions in my mind: 1. How long after the signs of cranial nerve involvement appear does the spinal fluid show changes either characteristic or suggestive of siphylis? 2. May cerebrospinal siphylis exist with an entirely normal spinal fluid? 3. Is it possible that other diseases may cause cranial nerve involvement, and if so what is the chance that such involvement is due to other diseases rather than to siphylis? 4. I was recently informed by a fellow physician of a syndrome called "Adie's" syndrome, in which fixed pupils have been present from birth. I should like more information on this disease.

George B. T. Ribble Jr., M.D., Philadelphia.

ANSWER.—The signs mentioned, in the absence of other confirmatory neurologic evidence and in the presence of a negative serum reaction, are in themselves not sufficient evidence on which to base a diagnosis of neurosiphylis.

1. It is the rule that the spinal fluid is positive for evidence of siphylis before the cranial nerve involvements have appeared. In other words, cranial nerve involvements are frequently a manifestation of a meningeal type of neurosiphylis, in which the spinal fluid is usually strongly positive at the time of the appearance of the cranial nerve lesions and remains so for some years thereafter.

2. Cerebrospinal siphylis may exist with an entirely normal spinal fluid. The so-called burned-out tabetic is an example of

this finding. In fact, 5 per cent of patients who have tabes dorsalis belong in the so-called burned-out group; or, in other words, individuals who manifest classic signs of tabes but in whom the serum reaction is completely negative and who have never received antisyphilitic treatment. Of course, the patient in whom the tabes is "burned out" as a result of treatment is quite commonly seen.

3. Other diseases may cause cranial nerve involvement, such as residues of mild types of encephalitis.

4. Adie's syndrome is of unknown origin. The patient has dilated pupils, which do not react to light and only slightly to convergence. It is usually associated with absence or decrease in the deep reflexes. It is not related to syphilis; it is frequently a family characteristic and is not progressive and usually causes the patient no inconvenience.

FACIAL HYPERTRICHOSIS

To the Editor:—What is the cause, if known, and the treatment, if any, of facial hypertrichosis in an otherwise normal unmarried girl of 24? The patient's past history is essentially normal except for the usual childhood diseases and an appendectomy two years ago when, the patient assures me, only the appendix was removed. The menarche occurred at 14; the menses have since been regular, with minor variations of four or five days' duration, moderately profuse and without pain. The facial hair has developed since adolescence. It is soft, fairly long and most marked on the upper lip and chin. Physical examination reveals no other abnormalities except a masculine distribution of pubic hair. The external genitalia and secondary sex characteristics are entirely normal. The internal genitalia are said to be normal on pelvic examination. The girl's libido and interests are entirely female. The problem appears to be a cosmetic one. Any advice would be appreciated.

M.D., New York.

ANSWER.—The causes of facial hypertrichosis in the young woman are undoubtedly bound up in part with the state of the glands of internal secretion. Just which glands are most influential and the exact balance necessary among their secretions to produce these changes in the facial hair are not entirely known. Tumors of the cortex of the adrenal gland have been found in some patients with hypertrichosis. Enlargement of the adrenal gland, however, is not always present nor is the excretion from the cortex known to be increased in every case. Certain ovarian tumors may be associated with hypertrichosis.

A number of methods have been used for the removal of these hairs. The x-rays have been used, but, to be effective, this method requires doses beyond the safe tolerance of the skin. Dangerous sequelae are apt to occur some time after such treatment. At present, all responsible persons are emphatic in saying that x-rays should not be used for the epilation of facial hair for cosmetic purposes.

Several methods which are safe to use are bleaching of the hair with an agent such as hydrogen peroxide solution to make them less conspicuous, epilation with forceps, the use of an epilating wax and finally electrolysis. The electrolytic method properly done is a safe procedure and removes the hairs permanently. It is expensive, takes a long time and is somewhat painful. For many patients it is the most practical method.

ANAL SPHINCTER CONTROL AFTER OPERATION

To the Editor:—A patient had an operation for rectal fistula five months ago. The internal opening was high, above the external sphincter, necessitating a division of the external sphincter. This was done once, at right angles to the fibers. For a time she naturally had no control but as healing took place this gradually returned, though not completely. She came to the office recently, complaining of some lack of control. Examination of the anal area shows the normal puckering of the skin around this area. Rectal examination shows some sphincteric action, but not tight enough to be termed a normal control. What can be done to correct this condition and what are the prospects of the control coming back to normal without any further treatment?

M.D., Illinois.

ANSWER.—The external sphincter muscle is anchored by the sacrococcygeus muscle directly in the posterior line. The sphincter muscle may be cut in this line without a repair and there will usually be a good return of function. If the sphincter muscle is cut in any other quadrant and is not repaired immediately, there is usually enough retraction of the cut ends so that control of the sphincter is poor. If there is a hiatus between the ends of the muscle in the depth of the scar, the ends of the muscle should be dissected free from the enveloping scar tissue and each end of the muscle should be anchored to the bottom of the wound by mattress sutures so that the ends are approximated and cannot retract. In most cases this gives a good return of function. Function will probably not improve much spontaneously at this late date.

VACCINIA VIRUS IN EYE

To the Editor:—To what extent is the eyeball endangered following accidental splashing of potent smallpox vaccine into the eye? To what extent is this danger increased by superficial abrasion of the bulbar conjunctiva sustained about a week earlier? What besides irrigation would constitute prophylaxis? I am aware that bulbar involvement can occur in generalized vaccinia and is deliberately achieved in animal inoculations, as in Paul's test.

M.D., Arizona.

ANSWER.—Splashing of vaccinia virus into the eye may be classified as a vaccination injury or unintentional infection with vaccine. The infection may occur either with animal lymph or with human lymph from an accidentally ruptured pustule on the vaccinated person.

If the infection occurs in a susceptible person, the resulting pustule will resemble a primary vaccination. If the patient has been previously vaccinated, the lesion will assume the character of a revaccinal lesion.

In order that accidental vaccination may occur, an injury or a break in the skin or mucous membrane must be present.

Accidental vaccination as a lesion of the eye occurs most frequently in persons suffering with eczema. An eczematous palpebral margin is a favorite site for such a lesion. If the infection is confined to the palpebral margins, healing may take place without scar formation. However, if epithelial defects occur, involvement of the conjunctivas and cornea occurs also.

Prophylaxis against accidental vaccination should consist of refusal to vaccinate whenever such cutaneous conditions as eczema, impetigo contagiosum and other forms of dermatitis are present.

In a case of accidental splashing of vaccine into the eye as noted in the query, a prompt irrigation of the eye with physiologic solution of sodium chloride or sterile water would probably be the most suitable prophylactic measure which could be undertaken. Any traumatizing procedure which might injure the conjunctival epithelium should be avoided.

IRRADIATION OF ADRENALS FOR HYPERTENSION

To the Editor:—Please discuss irradiation of the adrenal glands for essential hypertension. I am sure a patient of mine has too much internal secretion from the adrenal glands, and treatment by x-rays ought to give as good results as irradiation of the pituitary gland for oversecretion. The patient is a man aged 48 of florid complexion and perfectly well in every way so far as study in a hospital can determine and it is a definite essential hypertension. While 30,000 units of estrin controls the blood pressure it does not cure the condition, and if we could decrease the adrenal activity I believe we can cure this man. Can you give any information relative to irradiation of the glands in question for such a condition?

O. F. McKittrick, M.D., Linglestown, Pa.

ANSWER.—The most extensive studies of irradiation to the pituitary and adrenal areas in hypertensive disease are those of Hutton (*Radiology* 24:330 [March] 1935; *Clinical Med. & Surg.* 44:533 [Dec.] 1937). Distinct and encouraging subjective improvement is reported in about one half of the cases so treated. The objective reduction of the arterial tension is less striking. What reduction does occur is usually quite temporary. These observations have not as yet been fully confirmed by other investigators.

The recommended dose is small. The results with larger doses have been definitely less encouraging. Larger doses induce headaches, vertigo and nausea, and the arterial tension is less effectively reduced. Each side of the pituitary was treated with 50 roentgens, 120 kilovolts, 2 mm. of aluminum filter, 50 cm. skin target distance, 3 milliamperes for five minutes. The adrenals were irradiated through a single portal of 15 by 15 cm. with the same exposure. Such irradiation, although small enough to assure against gross damage, should not be given more frequently than once a week or in courses over six consecutive weeks. In women this radiation therapy should never be administered closer than one week prior to an expected menstrual period. More frequent or more intense therapy is prone to fail even in carefully selected cases. Hutton recommends that the two sides of the pituitary and the adrenal area be irradiated on the same day.

Though these and a few other reports are suggestive that such radiation therapy, if properly controlled, may prove to be an adjunct in the management of hypertensive arterial disease, the data are inconclusive. The role of endocrine imbalance in the etiology and pathogenesis of hypertension is but poorly established. A diagnosis of hypertension as due to "too much secretion of the adrenal glands" seems hardly justified on the purely negative evidence implied in the present case. One does not share the conviction that this is so major a factor in the etiology. Hypertension may be provoked in many different ways and etiologic diagnosis is frequently difficult and laborious.

However, guesswork and assumption should be reduced to a minimum. The hypertension of adrenal adenomas is associated with characteristic episodes of crisis, with extreme variability of the tension. In so-called essential hypertension there is no convincing evidence that adrenal hypersecretion plays any significant etiologic part.

While radiation therapy in this or any other instance of hypertensive disease is not recommended, the small doses advocated by Hutton are apparently quite safe. The transient nature of the reduction of the arterial tension following such irradiation implies that the fundamental origin of the disorder has not yet been reached.

CELL COUNTS FROM OXALATED BLOOD

To the Editor:—Can the red and white blood cells be counted in oxalated blood? Can a differential white count be made? If so, how long can the blood be left before these counts are made? M.D., Tennessee.

ANSWER.—Red and white blood cell counts may be done with oxalated blood. One or two cubic centimeters of blood is drawn from a vein with a dry syringe and needle and placed in a small tube, a small medicine glass or a shallow Petri dish which contains a mixture of dry ammonium and potassium oxalate crystals. The blood is stirred well by gentle shaking to prevent clotting and clumping. Red counts and white counts made from a solution of this type are accurate for several hours after the blood is drawn but should be stirred gently immediately before the filling of the pipet.

For the making of smears for differential counts, blood obtained in this way probably is not as good as blood obtained from a puncture of an ear lobe or a finger. Oxalated blood has a tendency to cause slight pyknosis of the red cells as well as the white cells, and in particularly important cases there may be some difficulty in obtaining adequate detail in the various types of cells.

Frequently blood is drawn as a routine from a vein for a Wassermann test and a blood chemistry examination, and 2 cc. is placed in a separate vessel for the carrying out of a complete blood count.

Osgood recommends this method and finds it satisfactory both for cell counts and differentials. Many others feel that red counts and white counts may be done with accuracy on oxalated blood and for at least five or six hours after the blood is drawn, provided the fluid is kept at cool temperatures and that it is shaken well before the pipets are filled. Blood smears for differential counts should be made as soon as possible after the blood has been drawn into the vessel containing oxalate.

SODIUM AMYTAL DURING LABOR

To the Editor:—Relative to the administration of sodium amytal by rectum during labor, would you kindly inform me as to the following points: (a) How early in labor may it be instituted? (b) What is the dosage per injection? (c) What menstruum and what amount are used per injection? (d) What is the frequency of reinjection, safety being considered?

Joseph Liburt, M.D., Huntington, N. Y.

ANSWER.—(a) Sodium amytal may be given as soon as labor is definitely established. (b) Six or 9 grains (0.4 or 0.6 Gm.) should be given by rectum as the first dose. Three or 6 grains (0.2 or 0.4 Gm.) may be repeated one or more times if the first dose is insufficient or the labor is prolonged. (c) The sodium amytal may be placed in 4 ounces (120 cc.) of warm water and this mixture placed in the rectum. (d) It is safe to reinject sodium amytal at the end of three hours. However, all patients who receive this drug must be watched constantly and carefully, and the repetition of the treatment should not be a matter of routine but should depend on each patient's reaction to the drug.

INFESTATION WITH FILARIA LOA

To the Editor:—A patient stated that he had been on the west coast of Africa in 1935 and had contracted Filaria of the Loa loa species. He has evidences of subcutaneous nodules and burrowings, and nocturnal appearances of worms in the conjunctiva. He has removed and brought me the worms. Will you please tell me if there is any specific treatment for this type of Filaria? M.D., Illinois.

ANSWER.—None of the forms of chemotherapy have been strikingly successful in treating infestation with Filaria loa, though arsenamine and autimony and potassium tartrate have been tried. When the worms can be seen under the conjunctiva or skin they can often be removed. Application of heat may be useful to bring them near the surface. Some surgeons have been successful in injecting a local anesthetic into the worm or near it, paralyzing it so that it will not escape. In other cases

a suture is passed quickly beneath the worm through the conjunctiva or skin, or it is grasped by fixation forceps through the conjunctiva, after which it is removed through a small incision. This may have to be repeated a number of times, if several worms are present.

PARTIAL DESTRUCTION OF NAIL BED

To the Editor:—Because of a trauma, the distal half of the left thumb nail of a man is not adherent to the underlying tissues. He would like it remedied. If the surface of the underlying tissue should be denuded with acid or by mechanical means and a pressure dressing then applied, would the nail and tissue become adherent?

Hobart P. Shattuck, M.D., Los Angeles.

ANSWER.—Failure of a nail to adhere to the underlying tissues is invariably the result of injury and partial destruction of the nail bed. As a result of such injury this portion of the nail bed does not function in a normal fashion and does not take part in the formation of the growing nail.

To denude the tissues under the nail with acid or by mechanical means would simply cause further destruction and would be likely to result in an open wound, which would heal with difficulty and with formation of dense scar tissue. Unfortunately there is no logical reason for thinking that such a procedure would be of value.

PROBABLE SPRUE

To the Editor:—A white woman aged 50 has had aphthous stomatitis for the past two or three years, with oozing of blood from the tongue, which is sore and atrophic and beefy red. There is painful lymphadenopathy in the neck and a painful sensation in the epigastrium and chest. The gastric acidity is normal. The blood picture is normal: hemoglobin 80 per cent, red cells 4,400,000 and white cells 5,200. There is a yellowish tinge to the skin and she has had considerable liver therapy (parenterally) though the exact quantity is not known. The mucous membranes of the vagina present the same aphthae as noted in the mouth, and the cervix is red and beefy, oozing a bloody discharge on examination. The rectum presents a similar appearance. Cultures from the mouth and rectum on Sabouraud's honey agar medium produced a creamy growth in four or five days, and microscopic examination showed some type of Monilia. The patient states that she has large foamy and foul-smelling stools at times, but the stools do not present this appearance at present, though she does pass streaks of blood and mucus. The condition is painful and there are spontaneous periods of improvement. There has been considerable loss of weight, though she is still not emaciated, as she was formerly overweight. 1. Is this a case of sprue? 2. Does the finding of Monilia in any way substantiate the diagnosis of sprue? 3. If this is probably not sprue, what steps might be taken to arrive at a satisfactory diagnosis? 4. What type of treatment would be indicated for such a case? She has had liver in considerable quantity, numerous vitamins, especially B₂, pancreatin and hydrochloric acid, solution of parathyroid and calcium lactate. 5. Is the dextrose tolerance test of much importance in this condition? M.D., South Carolina.

ANSWER.—1. This most likely is a case of sprue. 2. The finding of Monilia is believed by some authorities to substantiate the diagnosis.

3. As given.

4. The treatment outlined is quite comprehensive. It is assumed that the patient has had a proper, well balanced diet, which did not contain any of the ordinary sugar and cereals and was also low in its fat content. It might be wise to try potassium iodide in ascending doses, principally for its alterative action.

5. The dextrose tolerance test is of no significance in this condition.

INOCULATION OF CARCINOGENIC AGENTS IN MAN

To the Editor:—A laboratory technician has been working on mice and carcinogenic substances, particularly dibenzanthracene, benzopyrene, methylcholanthrin and styryl. While working with these she was bitten by a mouse, and as her hands were quite covered with these substances she was rather thoroughly inoculated. Would you let me know the possible consequences of an inoculation of one or several of these substances. M.D., Massachusetts.

ANSWER.—There is no available evidence to indicate that a single inoculation of the carcinogenic agents mentioned will produce a neoplasm at the site of injury.

CARD PLAYING BY COLOR BLIND

To the Editor:—Can a person who is color blind play cards?

Robert Boyd, M.D., Brooklyn.

ANSWER.—In all card decks the suits are distinguished as much by the form of the pips as by the color. Even if the red cards appear as a drab gray (it does to a real trichromat), the intensity of the hue is sufficiently different from that of the black cards to permit recognition even if unaided by the shape of the pips.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, December 23, page 2344.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written.* Part I. Various places throughout the United States and Canada, March 28. *Oral.* Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILIGOLOGY: November 1940. *If a sufficient number of applications are received before March 1 there will be an examination at New York, June 10-14.* Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *General oral and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 8-11. Applications for admission to Group A, Part II, examinations must be on file not later than March 15.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities of the United States and Canada, March 2. (The only written examination in 1940.) *Oral.* New York, June 8-10; Cleveland, Oct. 5. *Formal applications must be received before Jan. 1.* Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 18, following the Region III meeting of the American Academy of Pediatrics. Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded 485 applicants who were successful in the examination in part III, held during June and July 1939. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine.....	(1938, 2)		2
College of Medical Evangelists (1936, 4), (1937),* (1938),* (1938, 10), (1939, 3),* (1939, 52).....	(1939, 3)		72
Stanford University School of Medicine.....	(1939, 3)		3
University of California Medical School.....	(1939)		1
University of Southern California School of Medicine..	(1938)		1
University of Colorado School of Medicine (1934), (1936), (1938),* (1938, 4)	(1938, 2)		7
Yale University School of Medicine (1935, 2), (1936),* (1936, 5), (1937, 5),* (1937, 12), (1938, 2),* (1938, 12)....	(1938, 2)		39
George Washington Univ. School of Med. (1937, 2), (1938, 12)	(1938, 2)		14
Georgetown University School of Medicine (1935), (1936, 2), (1937), 5), (1938),* (1938, 20).....	(1938, 2)		29
University of Georgia School of Medicine.....	(1938)		1
Loyola University School of Medicine.....	(1939, 3)		3
Northwestern University Medical School (1935), (1937), (1938, 3), (1939, 5)	(1938, 4)		10
Rush Medical College.....	(1935), (1937, 4), (1938, 4)		9
The School of Medicine of the Division of Biological Sciences	(1938, 3)		3
University of Illinois College of Medicine.....	(1939, 2)		2
State Univ. of Iowa College of Medicine (1938),* (1938, 2)	(1938)		2
University of Kansas School of Medicine.....	(1938)		1
University of Louisville School of Medicine.....	(1938)		1
Tulane University of Louisiana School of Medicine (1936), (1937), (1938)	(1938)		3
Louisiana State University Medical Center.....	(1939)		1
Louisiana State University School of Medicine.....	(1938)		1
Johns Hopkins University School of Medicine (1935), (1936, 3), (1937, 2)	(1938, 2)		6
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1938, 2)		2
Boston University School of Medicine.....	(1937, 8), (1938, 18)		26
Harvard Medical School (1930), (1935, 2), (1936),* (1936, 6), (1937, 13), (1938, 11)	(1937, 8), (1939, 18)		34
Tufts College Medical School.....	(1937),* (1937, 8), (1939, 18)		27
Univ. of Michigan Medical School (1933), (1937), (1938, 2)	(1938, 3)		4
Univ. of Minnesota Med. School (1937), (1938, 3), (1939, 3)	(1937), (1938, 8)		9
St. Louis University School of Medicine.....	(1937), (1938, 8)		4
Washington Univ. School of Med. (1936), (1937), (1938, 2)	(1938, 2)		2
Creighton University School of Medicine.....	(1938, 2)		10
Albany Medical College (1935), (1937),* (1938, 2),* (1938, 6)	(1939, 3)		3
Columbia University College of Physicians and Surgeons.....	(1929), (1936), (1937)		12
Cornell Univ. Medical College (1936, 2), (1937, 5), (1938, 5)	(1937, 3), (1938, 5)		10
Long Island College of Medicine.....	(1937, 3), (1938, 5)		

New York Medical College and Flower Hospital (1937, 3),* (1937, 4), (1938, 12)	19
New York Univ. College of Med. (1936), (1937, 4), (1938, 3)	8
Syracuse University College of Medicine.....(1937)	1
University of Buffalo School of Medicine.....(1938, 5)	5
University of Rochester School of Medicine.....(1938)	1
Duke University School of Medicine (1936, 3), (1937, 2),* (1937, 16), (1938),* (1938, 13)	35
Western Reserve University School	1
University of Cincinnati College of	1
University of Oklahoma School of	1
University of Oregon Medical School.....:(1937), (1938, 2)	3
Hahnemann Medical College.....(1938, 2)	2
Jefferson Medical College of Philadelphia (1937, 3), (1938, 2),*	5
Temple University School of Medicine.....(1937), (1938, 2)	3
Univ. of Pennsylvania School of Med. (1937),* (1937), (1938)	3
Woman's Medical College of Pennsylvania.....(1938)	1
Meharry Medical College.....(1937)	1
Vanderbilt University School of Medicine.....(1937)	1
Baylor University College of Medicine.....(1932)	1
University of Texas School of Medicine.....(1938)	1
University of Vermont College of Medicine (1936), (1937, 2), (1938),* (1938, 4)	8
Medical College of Virginia.....(1937)	1
University of Virginia Department of Medicine.....(1938)	1
Marquette Univ. School of Med. (1937), (1938, 2), (1939, 2)	5
University of Alberta Faculty of Medicine.....(1938)	1
University of Toronto Faculty of Medicine.....(1936), (1938, 2)	3
University of Western Ontario Medical School.....(1938)	1
McGill University Faculty of Medicine.....(1935), (1938)	2
Karl-Franzens-Universität Medizinische Fakultät Graz (1937)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	
(1925), (1931), (1936)	3
Ludwig-Maximilians-Universität Medizinische Fakultät, München	
(1936)	1
Licentiate of the Royal College of Physicians and Surgeons, of the Royal College of Surgeons of Edinburgh, and of the Royal Faculty of Physicians and Surgeons of Glasgow	
(1937)	1
University of Edinburgh Faculty of Medicine.....(1937, 2)	2

* Certificates have not been issued.

* Certificates have not been issued.

Ohio October Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports twenty-three physicians licensed by reciprocity and one physician licensed by endorsement October 3. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....	(1930)		Minnesota
State University of Iowa College of Medicine.....	(1937)		Iowa
University of Kansas School of Medicine.....	(1935), (1936)		Kansas
Johns Hopkins University School of Medicine.....	(1938)		Maryland
University of Michigan Medical School.....	(1935), (1938)		Michigan
St. Louis Univ. School of Medicine (1936), (1937), (1938)	(1937)		Missouri
Columbia Univ. College of Physicians and Surgeons.....	(1937)		New York
Long Island College of Medicine.....	(1932)		New York
Syracuse University College of Medicine.....	(1924)		New York
University of Oregon Medical School.....	(1935)		Oregon
Jefferson Medical College of Philadelphia.....	(1931)		Penna.
Univ. of Pennsylvania School of Medicine (1912), (1927)	(1901)		Penna.
Western Pennsylvania Medical College.....	(1937)		Penna., Virginia
Medical College of Virginia.....	(1935)		Virginia
University of Virginia Department of Medicine.....	(1937)		Michigan
Marquette University School of Medicine.....	(1936)		New York
Université de Lausanne Faculté de Médecine.....	(1936)		New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Per Cent
Georgetown University School of Medicine.....	(1938)		83

Oklahoma June Report

Dr. James D. Osborn Jr., secretary, Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma City, June 14, 1939. The examination covered twelve subjects and included 120 questions. An average of 75 per cent was required to pass. Forty-three candidates were examined, all of whom passed. Twenty-seven physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Creighton University School of Medicine.....	(1938)		83
University of Oklahoma School of Medicine.....	(1938)		79
83, (1939)* 78, 79, 79, 79, 79, 80, 80, 80, 81, 81, 81, 81, 82, 82, 82, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 86, 86, 87, 87			

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
(1938) Louisiana			Arkansas
Johns Hopkins University School of Medicine.....	(1938)		Illinois
University of Michigan Medical School.....	(1927)		Kentucky
University of Minnesota Medical School.....	(1939)		Tennessee
Washington University School of Medicine (1922), (1934), (1936), (1937) Missouri	(1936)		Ohio
University of Cincinnati College of Medicine.....	(1936)		

Hahnemann Med. College and Hospital of Philadelphia (1938) Maryland
Univ. of Tennessee College of Medicine... (1937), (1938, 3) Tennessee
Baylor University College of Medicine..... (1936), (1938) Texas
University of Texas School of Medicine..... (1937), (1938) Texas
University of Virginia Department of Medicine..... (1934) Virginia

School
Harvard Medical School..... (1932) N. B. M. E.
* Licenses have not been issued.

Book Notices

Cancer of the Colon and Rectum: Its Diagnosis and Treatment. By Fred W. Rankin, B.A., M.A., M.D., Surgeon, St. Joseph's and Good Samaritan Hospitals, Lexington, Kentucky, and A. Stephens Graham, M.D., M.S., F.A.C.S., Surgeon, Stuart Crele Hospital, Richmond, Virginia. Cloth. Price, \$5.50. Pp. 358, with 133 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1939.

This monograph is a model of authoritative statement on a subject in which the authors have had wide experience and therefore becomes an important contribution to the subject. While no particularly new points of view or methods are advanced, the authors have selected from the literature the most important contributions of English and American surgeons and have clearly depicted them and at the same time have elaborated their own experiences in an orderly and systematic manner. Splendid printing and illustrations on fine paper, easily readable tables, and thorough and detailed consideration of the many phases of the subject make the monograph invaluable to any surgeon interested in the subject. For the general medical man the monograph offers an opportunity to learn in an authoritative way the early symptoms, the diagnosis, procedures, the treatment and the prognosis of carcinoma of the rectum and colon. In view of the fact that about 40 per cent of deaths from cancer are due to cancer of the gastrointestinal tract and that 15 per cent are due to cancer of the bowel including the small intestine, it is obvious that this monograph covers a field that must appeal to every thoughtful medical man.

The chapter on operability and prognosis is an especially interesting one because in the first instance operability is often a matter depending on the experience and leanings of the individual surgeon and prognosis in turn depends much on operability and the careful estimation of the extent of the pathologic process. In this chapter, therefore, the reader is given a glimpse at the authors' judgment in selection of patients for operation and an estimation of the criteria which make for a long cure.

There are a few places in the monograph where exception to the views of the authors may be taken and in order not to make our praise of this work too florid, the relation of carcinomatous lymphatic involvement in prognosis can be mentioned; strictly speaking, lymphatic involvement is of most value in prognosis when the methods of determination and results of the study of lymphatic involvement are described. For instance, in the examination of removed specimens of cancer of the bowel for lymphatic involvement only twenty glands on an average can be removed and examined, contrasted to an average of from fifty to eighty glands which can be removed from the specimen after clearing it of blood and removal of the glands by means of transillumination. In the first instance, in which only twenty glands are examined, the involvement with cancer is about 45 per cent; when fifty or more glands are examined microscopically, the involvement is nearly 70 per cent. It is obvious that such a difference in the degree of involvement depending on the thoroughness of removal of the glands in a specimen will greatly modify the longevity figures which are based on lymphatic involvement.

The chapters on choice of operation, operative mortality and end results are excellent. The critical estimation of the results of others and the compilation of their own experience strike a high note in surgical writing.

Some of the high lights include the increasing tendency of experienced surgeons to remove cancer of the rectum by a one stage abdominoperineal procedure, the authors' abandonment of preoperative peritoneal vaccination, the value of resection of the left half of the colon by obstruction resection, and the five year survival figures in nearly 40 per cent of operable cases.

Were it possible to fill the racks of our medical libraries with medical monographs such as this one, the student of medicine would indeed be fortunate.

The Statistics of Pulmonary Tuberculosis in Denmark 1925-1934: A Statistical Investigation on the Occurrence of Pulmonary Tuberculosis in the Period 1925-1934, Worked out on the Basis of the Danish National Health Service File of Notified Cases and of Deaths. By Marie Lindhardt. Acta tuberculosa Scandinavica, Supplementum III. Paper. Pp. 179 with 17 illustrations. Copenhagen: Ejnar Munksgaard, 1939.

In this work attention is called to the fact that in 1896 the General Danish Medical Association requested the board of health to take steps to introduce obligatory notification of "pulmonary consumption" on physicians' weekly report lists and the inclusion of pulmonary consumption among the diseases for which free disinfection was obtainable. Because of certain objections on the part of the board of health it was not until April 1905 that Parliament passed two important tuberculosis laws, one of which dealt with the support of tuberculosis institutions by the state, and the other the Prevention of Tuberculosis Act, which provided for compulsory notification of cases of tuberculosis. Thus Denmark has had compulsory notification for all forms of pulmonary tuberculosis, with individual notification of every case and every death, continuously since 1905.

The present report is based on 41,704 notifications of fresh cases of pulmonary or laryngeal tuberculosis, in which there were 20,173 deaths. All of these deaths occurred in the ten year period 1925-1934. The cases are studied with reference to the various parts of the country from which they came and according to sex, age and occupation. Observations are also presented on the duration of cases that proved fatal.

It was pointed out that both morbidity and mortality are highest among females and that in both males and females the morbidity and mortality was highest in the age group of 20 to 24 years. For the entire country during the decade of 1925-1934, approximately one third of all deaths among males in the ages of 20 to 29 were due to pulmonary tuberculosis, whereas among females it was about one half between 20 and 24 years. Of all deaths in the decade, three fourths occurred on an average of eighteen months after notification for both sexes.

This volume contains numerous tables and curves, which are of great value to those interested in this particular phase of tuberculosis work. A valuable reference list is included.

The Health Insurance Doctor: His Role in Great Britain, Denmark and France. By Barbara N. Armstrong. Cloth. Price, \$3. Pp. 264. Princeton, N. J.: Princeton University Press, 1939.

The blurb on the jacket says of the author "She was formerly executive secretary of the California Social Insurance Commission and for more than two decades has campaigned vigorously for health insurance." While this bias is evident in many places, no other book gives as detailed and accurate a survey of the British, Danish and French systems of sickness insurance.

The figures as to the percentage of physicians engaged in panel practice are a little hard to reconcile with those given in the "Report of British Health Services" by PEP (Political and Economic Planning). "The drugs capitation fee is uniform for all areas" and in 1936 this was set at 56 cents per head if all drugs were supplied. In view of the complaints of "excessive prescribing" this seems a very inadequate sum if really necessary drugs are supplied.

The statement is made repeatedly that physicians do not object in any of these systems to certification for inability to work, and there is considerable effort to show that certification causes but little conflict. The reader can draw his own conclusions from the description of the elaborate machinery that is maintained at least in Great Britain and France on the side of both the medical and the insurance carriers to hunt out abuses of certification. The conflicts in the French system between the insurance carriers and the physicians is emphasized, but little attention is given to the extent to which this is due to the participation, in spite of the law, of the carriers in the control of medical service or that this conflict is largely over certification for cash payments.

"For completeness of medical benefits," says the author, "Denmark with nearly fifty years of health insurance behind her stands out conspicuously in the three systems of health insurance review." That this superiority is due to the almost complete domination of the Danish system by the Danish medical association receives no emphasis, although the facts are accurately stated. Neither is there any stress laid on what

would seem to be a highly significant fact—that the Danish system is not really an insurance system since hospitalization, which is much more frequent than in most countries, is paid for largely by the state and local communities, which also pay much of the cost of insurance. Only members of the Danish Medical Association can engage in insurance practice, and the control of medical practice is almost entirely in the hands of the professional association. Moreover, no mention is made of the fact that during all but the last eight of the fifty years existence of the Danish system it was a voluntary system.

If the bias of the writer, which seems to be inseparable from all descriptions of sickness insurance, is kept in mind, this book is a valuable source of reference, especially on the details of organization, for any one interested in the subject of sickness insurance.

The Patient as a Person: A Study of the Social Aspects of Illness. By G. Canby Robinson, M.D., LL.D., Sc.D., Lecturer in Medicine, Johns Hopkins University, Baltimore. Cloth. Price, \$3. Pp. 423. New York: Commonwealth Fund; London: Oxford University Press, 1939.

This book should be carefully studied by general physicians and medical specialists of all fields. Written by an internist of great reputation, it adds new emphasis to the social aspect of illness. The author has studied in cooperation with social workers 174 patients suffering from a wide variety of diseases. He describes in succinct abstracts the illnesses and the environmental factors involved, so that the total picture of patient, disease and social factors are clearly visualized. The evidence is so well presented and the conclusions are so important for modern medicine that the volume could be made the text from which a special course might be taught in medical colleges. Concerning recent trends in governmental circles the following is quoted: "If the proper relationship of doctor and patient is retained through thick and thin, and the patient is given adequate consideration as a total individual, medical service will not suffer, no matter whatever the methods of organization, distribution and payment and whether or not the patient has a free choice of doctors beyond narrow limits. And it is the preservation of this relationship which new plans of medical service threaten that should be the keynote of the conservatism of the medical profession. If the medical profession is to give its best to the public which is now demanding changes in its medical service by legislation and government control, the so-called art of medicine must not be swept away by the waves of reform and of social reorganization. . . . The true physician must know his patient as an individual.

Fifty Years a Doctor. By John Kercher. Cloth. Price, \$2. Pp. 247, with 15 illustrations. Boston: Meador Publishing Company, 1939.

Here are numerous incidents in the career of a physician who has practiced fifty years. He recounts the difficulties of getting started in practice in Chicago and notes that his office at one time was right next to that of Frank Billings and Herman Spalding, at the corner of Jackson and State streets, where the Hub clothing store is at present. He recounts his experiences in joining a group organized by his brother-in-law, a captain in the Chicago Fire Department, to go to the Klondike to seek gold in 1898. The book has little scientific or literary value.

Spezielle Symptomatologie und Diagnose innerer Erkrankungen in zwei Bänden. Von Professor Dr. Gottfried Höller, Vorstand der III. Medizinischen Abteilung im Allgemeinen Krankenhaus in Wien, und Dr. Robert Pfleger, Assistant der Abteilung. Mit einem röntgenologischen Anhang von Primararzt Dozent Dr. Rudolf Pape. Bände I und II. Cloth. Price, 45 marks. Pp. 592; 593-1256, with 109 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1939.

This is another book on diagnosis in which the basis of the discussion is a symptom either subjective or objective in character. The whole subject of internal medicine is covered. The reader looks in the index for the symptom which is most prominent and is referred to the location in the text for a differential diagnosis of the subject in which he is interested. While the subject matter is fairly good, it is rather inadequate and needs further elaboration. The experience of the reviewer in trying to obtain information on several subjects does not lead him to believe that it has any more value than as a guide. For further information, other sources of information must be consulted. There are numerous illustrations and a good index, and it is well printed.

Les erreurs et les fautes en urologie: Etude critique, clinique et thérapeutique. Par L. Strominger, docteur d'urologie à la Faculté de médecine de Bucarest. Préface de M. le Prof. G. Marion. Paper. Price, 45 francs. Pp. 176. Paris: Masson & Cie, 1939.

In this monograph the author considers the errors which are not infrequently made in the diagnosis, prognosis and treatment of urogenital conditions. The introduction, written by Professor Marion, has as its main theme the fact that "we learn more through our errors than through our successes." The book is filled with urologic wisdom which only a man with a wide practical experience could have acquired. He warns against the indiscriminate routine use of the cystoscope because of the damage which can be caused by it. He reminds the reader that appendectomies have frequently been performed erroneously in cases in which treatment should have been given for uterine and vesicular inflammation. The value of the book lies quite as much in its repetition of important errors which have been mentioned by other writers as in its presentation of new material. It emphasizes the things we have already learned and may forget and, in addition, it teaches valuable lessons that we should have known. The entire urogenital tract is systematically covered, beginning with renal disorders, proceeding to the ureters and bladder, and concluding with the genital organs. The book ends with a presentation of errors in radiology, which every surgeon and urologist should read because of its importance. The bibliography, while rather extensive, is limited to the works, mostly French, consulted by the author. A careful study of this valuable volume will help the reader to avoid many snares and pitfalls, with their occasionally unhappy consequences.

The Harvey Lectures Delivered under the Auspices of the Harvey Society of New York 1938-1939. Under the patronage of the New York Academy of Medicine. By Dr. Guy F. Marrian et al. Series XXXIV. Cloth. Price, \$4. Pp. 279, with illustrations. Baltimore: Williams & Wilkins Company, 1939.

This volume contains the following lectures: Guy F. Marrian, University of Edinburgh, aspects of the intermediary metabolism of the steroid hormones; A. Ashley Weech, College of Physicians and Surgeons, New York, significance of the albumin fraction of serum; Eugene F. Du Bois, Cornell University Medical College, heat loss from the human body; Edwin J. Cohn, Harvard Medical School, proteins as chemical substances and as biologic components; Edwards A. Park, Johns Hopkins University, pathology of rickets with particular reference to the changes of the cartilage-shaft junctions of growing bones; K. Linderström-Lang, Carlsberg Laboratory, Copenhagen, distribution of enzymes in tissue and cells; C. H. Danforth, Stanford University, genic and hormonal factors in some biologic processes; Albert Szent-Györgyi, University of Szeged, biologic oxidation and vitamins.

Studien über experimentelle arthritiden und Karditiden. Ein Beitrag zur Frage der pathogenetischen Bedeutung endokriner Faktoren bei dem sogenannten Gelenkrheumatismus. Von Eric Jonsson. Acta medica Scandinavica, Supplementum C. Paper. Pp. 122, with 35 illustrations. Stockholm: Tryckeri A.-B. Sätterlund & Krook, 1939.

This is a short monograph on the relationship between endocrine dysfunction and arthritis. The author presents a historical review of the literature on the endocrine and arthritis relationship, which he summarizes to the effect that the endocrine disturbance is either the only cause of the joint symptoms, or a predisposing factor, or a coordinated one. Exclusive endocrine etiology is declined but the predisposing factor and the coordinated character are given the benefit of doubt from the review of the literature. The original work of the author is directed toward the solution of the question how far animal experiments will reveal the causal relation between endocrine disturbance and arthritic symptoms. The experiments of the author include serum and tuberculin injections, inoculation with streptococcus and polymorphodiplococcus, and foreign protein injections, applied to castrated animals as well as to controls. The conclusion of the author seems to be that the results indicate that endocrine influences exist in castrated animals; they have a part in the pathogenesis of certain forms of joint rheumatism, are not of dominant significance, and can be considered only as a predisposing factor. This seems to be all that is brought out in this rather short but well written and clearly presented monograph.

Les calculs de l'urètre. Par Pierro Maequet. Préface du Professeur G. Potel. Paper, 45 francs. Pp. 187, with 22 illustrations. Paris: Masson & Co, 1939.

In this monograph the ureteral calculus is dealt with from the purely clinical point of view. The work is based primarily on the personal experience of the author, who for many years was assistant and chief of clinic under Prof. Gaston Potel. The latter has written a laudatory preface. Throughout the work emphasis is placed on the potential damage which the ureteral calculus can inflict on its associated kidney and the imperative need for its early removal from the urinary tract in order to prevent or minimize this damage. Jeanbrau, credited with having done the first important work on the ureteral calculus, is quoted as saying "The renal calculus often can wait; the ureteral calculus cannot wait." The author emphasizes this dictum throughout the work. Diagnosis and therapy occupy the major portion of the book. Little or no reference is made to the etiology of calculus or of the role which infection may assume. The illustrations are excellent and indicate well what they are intended to show. Twenty-seven cases of ureteral calculus are reported in detail. The work ends with an extensive bibliography covering the last thirty years.

The Management of Tuberculosis in General Hospitals: Patients, Staff, Employees. Prepared by William H. Oatway Jr., M.D., Assistant Professor of Medicine, University of Wisconsin Medical School, Madison, for the Council on Professional Practice of the American Hospital Association. Cloth. Price, \$1. Pp. 78. Chicago, Illinois: American Hospital Association, [n. d.].

This work fills a long felt need, since there has not previously been available any outline of procedure for the management of tuberculous patients in general hospitals. Dr. Oatway was unable to find any hospital in the entire nation that has at present a complete tuberculosis program. The use of general hospitals for the isolation and treatment of tuberculosis has been recognized by a number of national and international medical and health organizations. As early as 1908 the International Congress on Tuberculosis, which met in Washington, D. C., urged the care of tuberculous patients in general hospitals. In 1912, and on a number of occasions since, the National Tuberculosis Association has made similar recommendations. The American Medical Association in conjunction with the United States Public Health Service in 1920 recommended the provision of wards in general hospitals for the care of tuberculous patients. The Canadian government has urged that hospitals receiving government aid hold available 10 per cent of their beds for tuberculous patients. Many physicians expert in the field of tuberculosis have strongly recommended the use of general hospitals for tuberculous patients, such as the late Dr. Lawrence Flick, of Philadelphia, who in 1895 arranged for such beds in general hospitals.

The author presents twelve reasons why general hospitals should admit tuberculous patients. He emphasizes the educational effects of having tuberculous patients in general hospitals for the medical staff, including interns and students, and also the nursing staff, including students.

He also calls attention to certain objections that have been offered to the hospitalization of tuberculous patients, but he states that there is apparently no logical reason for not admitting such patients, provided the danger of infection is controlled by thoroughly modern procedures. Dr. Oatway emphasizes the danger of infection to other patients and the entire personnel of the hospital and shows that for 120 years the high incidence of tuberculosis among nurses has been under discussion. He then proceeds to show how hospital personnel as well as other patients can be protected against exposure. It is strongly recommended that all members of the personnel of the hospital be adequately examined periodically for tuberculosis and that all patients admitted to any hospital be examined for tuberculosis in contagious form regardless of the condition for which the patient was admitted. When persons with contagious tuberculosis are found in the personnel or among the patients, a provision is recommended for them in which a technic is practiced in an attempt to control the spread of the disease. Thus the environment of the hospital is rendered free from contagious tuberculosis except in a small section set aside and equipped to manage such cases properly.

The last twenty pages of this book is devoted to an outline of a program for management of tuberculosis in a general hos-

pital. This is prepared in such a manner that any one who reads it can find all the information necessary for setting up a tuberculosis service in a general hospital and managing the control of this disease throughout the entire institution. The author of this book, the American Hospital Association and especially the Council on Professional Practice are to be congratulated on publishing and distributing such a timely volume. An extensive list of references greatly enhances its value.

Psychiatrie: Ein Lehrbuch für Studierende und Ärzte. Von Prof. Dr. Kurt Koller, Nervenarzt in Frankfurt a. Main. Paper. Price, 13 marks. Pp. 415, with 5 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1939.

This is just another compilation of clinical data labeled psychiatry by a practicing specialist for students and physicians. It is interesting that in this German volume published in 1939 there is a large section devoted to military questions. The book has no value.

The Stale and Medical Research. By Sir Edward Mellanby, K.C.B., M.D., F.R.C.P., Secretary, Medical Research Council. Harvelan Oration, Royal College of Physicians, 18th October 1938. Cloth. Price, 3s. 6d. Pp. 52. Edinburgh & London: Oliver & Boyd, 1939.

The permission given William Harvey by Charles I to make use of deer and other animals in the royal parks for investigative purposes is held to be probably the first instance of state support of medical research. Support of research is discussed, particularly as illustrated by the Medical Research Council in England, which of late has been receiving an annual grant of £195,000 from the government. The organization and the activities of the council form the main part of the lecture, which will be read with interest by those who are concerned with administration of research.

Hormones and Resistance: An Acute Antinarcotic and Antitoxic Effect of the Estrogenic Hormones. By Tore Patrik Störtebecker. Acta pathologica et microbiologica Scandinavica Supplementum XXI. Paper. Pp. 294, with 4 illustrations. Copenhagen: Ejnar Munksgaard, 1939.

The author has presented his experiments on the antinarcotic and antitoxic aspects of the estrogenic substances and on the sex variation in resistance to various poisons and anesthetics. He has concluded that estrogens protect the animal against these substances to a varying degree. Much of the material should be confirmed, since there are relatively few data in the literature on this subject. The practical importance of this work is still to be demonstrated.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Infection Following Childbirth Not Proof of Malpractice.—Sept. 2, 1935, one of the plaintiffs employed Dr. Clark, a member of a medical clinic, to attend his wife during confinement. Dr. Clark was called in an emergency, the patient's family physician not being available, and arrived a few minutes after the baby was born. He tied off, cut and bandaged the umbilical cord. He delivered the afterbirth and examined it in a general way. He cleansed the patient's external genitalia and caused sanitary pads and bandages to be prepared and used. He instructed the patient's mother to bathe the patient with a compound solution of cresol and water. On departing he gave no instructions other than a schedule for the baby's feedings and advice that the mother be given light food.

According to attendants, on September 3 and 4 a fever developed and a lump was noted in her side, but although Dr. Clark visited her on those days he made no examination, not even taking her temperature or pulse. Later she had pains in her side, headache and an offensive vaginal discharge. On the evening of September 4 the patient became worse and, in the absence of Dr. Clark from the city, another member of the medical clinic was called, but he did not visit her until the following morning. Then he did not take her temperature

with a thermometer, did not take her pulse and made no physical examination other than to examine her throat. He told her she might have scarlet fever and prescribed acetylsalicylic acid and quinine and advised warm soda water and alcohol baths. From September 5 to 10 the patient had a high temperature and an increasing pulse rate. Dr. Clark saw her on September 6 and 7 and ordered the quinine that had been prescribed by his associate discontinued, but he did not examine her.

On September 10 another physician was called, one apparently not connected with the medical clinic with which Dr. Clark was connected. He found that the patient had a temperature of 104 F. The next morning he made a vaginal examination and, according to the patient's mother, removed a piece of the afterbirth, about 3 inches (7.5 cm.) in length, $1\frac{1}{2}$ inches (3.8 cm.) in width and $\frac{1}{2}$ inch (1.3 cm.) in thickness, and also "a clot of something white." The patient's mother claimed that she observed a tear in the right side of the patient's vagina. The patient died September 12. The death certificate issued by the physician last in attendance gave as the cause of death "Child Birth followed by Septic Toxemia (Streptococcus)."

The husband and the children of the deceased woman brought suit for malpractice against the defendant physicians Dr. Clark and his associate in the medical clinic. From the judgment of the trial court directing a verdict in favor of the defendants, the plaintiffs appealed to the Supreme Court of Utah. In their complaint, the plaintiffs based their charge of negligence on the following facts: 1. Dr. Clark did not carefully examine the placenta and therefore failed to ascertain that a portion of it had not been expelled. 2. Dr. Clark failed to discover and treat an alleged laceration of the patient's vagina. 3. Dr. Clark and his associate member of the medical clinic failed to take the patient's temperature or pulse or to make any examination other than to examine her throat, and therefore failed to diagnose and treat her for the condition from which she was suffering. The evidence presented, however, said the Supreme Court, was not sufficient to require the submission of the case to the jury.

The testimony of the medical witnesses called by the plaintiffs contained little in support of their own charges but did support the defendants' defense. Two medical experts testified that a general examination of the placenta such as was made was a proper examination and was such as an average physician of reasonable care and skill in that community would have made. Another witness testified that a physician, even after a most careful examination of the placenta, might fail to discover that a portion of the afterbirth had not been expelled and that the defendants' treatment conformed to the practice of ordinary, careful and skilful physicians in the community. Women die from puerperal fever, an infection which may come either from the blood stream of the patient or from the outside, in spite of anything that the physician or nature can do. Patients with "septic toxemia, due to streptococci or otherwise," he testified, are treated symptomatically or expectantly by rest in bed, reduction of fever, general care and alleviation of symptoms. Alcohol baths and the administration of acetylsalicylic acid and quinine would, in his opinion, be good treatment.

The fact that there was an offensive vaginal discharge or lochia, it was testified, did not in and of itself indicate that there was anything wrong. In the absence of lacerations or tears of the birth canal visible from the outside, it would not be considered good practice in that community, this physician testified, unless the patient were in a hospital where aseptic conditions could be obtained, to explore the birth canal by instrumentation or otherwise to determine whether internal tears were present or whether any portion of the placenta remained in the uterus. Even if the patient were in a hospital it was generally accepted as good practice in that community to refrain from exploring the birth canal unless some unusual condition appeared, such as a severe hemorrhage. The danger of such exploration may be greater than that of leaving to nature the care of any internal condition which may exist. Failure to take the pulse and temperature and to examine the patient otherwise than was done might be consistent, according

to medical testimony, with good practice in that community, or it might be bad practice, depending on the circumstances. The ordinary skilled and careful physician, it was testified, could determine the condition of his patient by observation without taking the temperature or pulse. The taking of the temperature or pulse did not constitute treatment, and failure to take either of them did not make the condition of the patient better or worse.

The doctrine of *res ipsa loquitur*, that the event speaks for itself, said the Supreme Court, has no application in this case. To recover damages, the plaintiffs had to show that the cause of the injuries complained of was the failure of the defendant physicians to exercise such care and diligence as was ordinarily exercised by skilled physicians in the same field of medicine in that vicinity. The court was unable to find anything which the defendant physicians had done that the evidence showed they should not have done or failed to do anything that the evidence showed they should have done. The expert medical testimony showed that the practice of the defendant physicians and the treatment prescribed by them was in conformity with that of the ordinary skilful physician in the community. Neither the testimony of lay witnesses nor that of expert medical witnesses pointed to any act of commission or omission on the part of the defendants that was the proximate cause of the patient's death. Although the testimony of the patient's father, mother and husband might have given rise to an inference that all was not done that in their minds they believed should have been done, the testimony that they gave did not indicate just what it was that they had in mind that should have been done.

In the opinion of the Supreme Court of Utah, the trial court properly refused to submit the cause to the jury, because to do so would improperly set the jury to conjecturing, surmising or guessing at the possibilities as to what should or should not have been done. Accordingly the court affirmed the judgment directing a verdict in favor of the defendant physicians.

One of the justices, however, Justice Wolfe, in concurring in the decision of the court, added the following interesting commentary:

I do not think that the rule that the testimony of a witness is no stronger than is shown by the cross examination applies in the case where cross and direct examination are practically reversed. Where it becomes apparent that a witness, while not hostile, is very reluctant to testify against a friend or one of his own profession, or is desirous of aiding him as far as possible by "going easy," or makes his answers all comport with a protective motive in the realm where opinions might differ, or gives him every benefit of the doubt in testifying that such conduct "might be good practice" or testifies with apparent mental reservations and simply awaits the cross examination to emphasize this protective motive, I do not see that the rule applies.

"It is not the duty or right of this court to appraise the evidence except to determine whether there is any substantial evidence to support the verdict or findings. If the opinions of the doctors who testified, as to the defendants' conduct that it was in conformity with the usual skilful practice under the conditions of this case in their community, appear to the layman to put that practice in that community on too low a level, the judicial finding of that fact must rest with the jury and not with this court. If the opinion means to hold by implication or otherwise that all negligence based on conduct of a doctor in an obstetric case must be proved by expert medical testimony, I do not agree.

—*Edwards v. Clark (Utah)*, 83 P. (2d) 1021.

Society Proceedings

COMING MEETINGS

- American Academy of Orthopedic Surgeons, Boston, Jan. 21-23. Dr. Carl E. Badgley, 1313 East Ann St., Ann Arbor, Mich., Secretary.
- American Orthopsychiatric Association, Boston, Feb. 22-24. Dr. Norville C. La Mar, 149 East 73d St., New York, Secretary.
- Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, Feb. 12-13. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.
- Eastern Section, American Laryngological, Rhinological and Otolological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.
- Middle Section, American Laryngological, Rhinological and Otolological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.
- Society of Surgeons of New Jersey, Camden, Jan. 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
- Southern Section, American Laryngological, Rhinological and Otolological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.
- Western Section, American Laryngological, Rhinological and Otolological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 141-168 (Nov.) 1939

Clinical Aspects of Thyroid Disease. A. Taylor, Clifton Springs, N. Y.—p. 141.

The Enema: Its Uses and Abuses. C. D. Gaston and H. B. Williams, Birmingham.—p. 143.

Habitual Use of Alcohol in Alabama. W. D. Partlow, Tuscaloosa.—p. 145.

Acute Gastrointestinal Intoxication: Management in Infancy and Childhood. J. H. Baumhauser, Mobile.—p. 148.

Atabrine as Malarial Prophylactic Agent: Experiments in Alabama. D. G. Gill, Montgomery, and M. Smith, Tuskegee.—p. 151.

American J. Obstetrics and Gynecology, St. Louis

38: 557-742 (Oct.) 1939. Partial Index

Metabolism and Utilization of Progesterone Given Intramuscularly to Women. E. C. Hamblen, N. B. Powell and W. K. Cuyler, Durham, N. C.—p. 557.

Toxemia Mortality in the Southern States: Critical Study of 577 Maternal Deaths in North Carolina. W. Z. Bradford, Charlotte, N. C.—p. 574.

*Relationship of Time of Ligation of Cord to Red Blood Count of Infant. H. B. Frischkorn and M. P. Rucker, Richmond, Va.—p. 592.

Current Views on Causation of Menstruation. E. T. Engle, New York.—p. 600.

Effect of Ingested Estrone (Progyon DH) and Parenterally Administered Synthetic Progesterin (Proluton) on Human Castrate Uterus. T. Neustaedter, New York.—p. 609.

Anterior Pituitary-like Hormone in Late Pregnancy Toxemia: Summary of Results Since 1932. G. Van S. Smith and O. W. Smith, Brookline, Mass.—p. 618.

Effect of Crystalline Corpus Luteum Hormone, Progesterone, on Ovaries and Related Endocrine Organs. C. Mazer and S. L. Israel, Philadelphia.—p. 625.

Effect of Pregnancy on Gastric Secretion. J. S. Labate, New York.—p. 650.

*Prolapse of Uterus, Hydronephrosis, Hypertension: Probable Sequence of Events. P. H. Wosika and C. C. Maher, Chicago.—p. 684.

Granulosa Cell Neoplasm with Discussion of Possible Histogenesis. M. B. Dockerty and W. C. MacCarty Sr., Rochester, Minn.—p. 698.

*Suburethral Abscesses, Urine Pockets and Diverticula in Female Urethra: Report of Eight Cases. H. E. Schmitz and P. A. Nelson, Chicago.—p. 707.

Practical Treatment of Gonorrheal Endocervicitis. K. P. A. Taylor, Puerto Armuelles, Panama, Canal Zone.—p. 712.

Improved Method for Applying Pelvic Heat Using Air. L. B. Newman, Chicago.—p. 725.

Ligation of Cord and Erythrocyte Count of Infant.—

In determining the relation of the erythrocyte count of the newborn and the time at which the cord is ligated, Frischkorn and Rucker at varying intervals tied the cords of more than 400 unselected infants. All the patients were white and all had sodium amytal-scopolamine analgesia and ether anesthesia. The cord continued to pulsate longer than in Budin's series, in which probably no anesthesia was used. In one instance pulsations continued for fifty minutes. The amount of blood that drained out of the placental end of the cord was measured. A blood count was made by the hospital technician within twenty-four to thirty-six hours. In fifty-nine cases in which the cord had ceased to pulsate before it was tied the infant's erythrocyte count averaged 5,783,400, whereas in 333 cases in which the cord was pulsating when tied the count averaged 5,198,919, a difference of 584,481. There was practically no correlation between the number of minutes that elapse before the cord is ligated and the erythrocyte count of the infant. The length of time before tying the cord had no influence on the amount of blood left in the umbilical vessels. On the other hand there is a significant negative correlation between the amount of blood that is left in the umbilical vessels and the number of erythrocytes in the infant's circulation. Those infants whose cords were allowed to stop pulsating before they were ligated had higher erythrocyte counts. This is significant enough to justify waiting until the cord ceases to pulsate and the umbilical vessels collapse, especially in small and premature infants.

Prolapse of Uterus, Hydronephrosis, Hypertension.—Wosika and Maher studied the relationship between the urinary tract and hypertension in fifteen cases of prolapse of the uterus encountered in private cardiac practice. Urologically, the patients presented variable x-ray changes by retrograde catheterization and intravenous urograms, from normal conditions to massive dilatation of the ureters and renal pelvis. Urethral and bladder irritation were invariably constant with evidence of infection, usually with *Bacillus coli* and staphylococci. From the cardiovascular standpoint, hypertension was present consistently with varying levels in all cases with the possible exception of one of extreme uremia and shock due to the incarceration. Evidence of left ventricular enlargement was present in from mild to extreme degrees, as shown by 2 meter roentgenograms. The electrocardiogram showed left axis deviation to be present in ten cases and normal axis deviation in five. Cardiac complications included congestive heart failure, coronary sclerosis and cerebral thrombosis. An associated study of the incidence of hypertension in a somewhat larger series of patients with prolapse was made possible through the records of the first eighty-four patients with prolapse entering the Passavant Memorial Hospital. Hypertension was found to be present in sixty-one of the eighty-four cases. The frequency of hypertension in these cases would indicate strongly that the occurrence of increased blood pressure and prolapse cannot be explained solely on a basis of coincidence. Factors commonly associated with increased blood pressure such as age, heredity and chronic nephritis were considered. The urinary observations were not characteristic of chronic glomerulonephritis, although transient albuminuria and casts were found in those patients who were observed over a period of years. The urologic evidence pointed to the infectious and obstructive character of the renal lesion rather than to a true glomerulonephritis. It was impossible to obtain evidence which either proved or disproved the hereditary factor. The damage to the urinary tract was found to be varying degrees of hydronephrosis and hydro-ureter, with recurrent infection. While the exact mechanism of ureteral compression does not seem to be entirely clear, obstruction is consistent with complete prolapse. While obstruction of the ureters was established readily with the complete prolapse, not all patients could be proved as having a resultant hydronephrosis and hydro-ureter by present day criteria. Generally, patients having prolapse of short duration had minimal urologic changes, while greater deformity was present when the procidentia existed for an extended period of time. Theoretically, it is possible for urinary obstruction, regardless of the cause, to produce hypertension. The role of obstruction in the production of hydronephrosis has been established. The role of infection also must be considered as a factor. The diagnosis of essential hypertension or hypertension of unknown origin is not justifiable unless all defects of the urinary tract are excluded. It seems that a perfect mechanism exists for the production of hypertension in patients with prolapse of the uterus, when the obstruction in the urinary tract produces hydronephrosis. The enlargement of the pelvis of the kidney encroaches on the blood supply. The partial ischemia that results produces systemic hypertension by an unexplained mechanism.

Abscesses and Diverticula in Female Urethra.—Schmitz and Nelson state that diverticulum of the female urethra, once considered rare, is now a not unusual diagnosis after careful gynecologic or urologic examination. More than 100 cases have been reported, and additions are rapidly being made. The authors cite eight cases. They are not to be confused with abscesses or cysts of Skene's glands, vaginal cysts or small vaginal myomas. Urethral diverticula may be classified either as true or as false. When all the layers of the urethra are involved in the process, they are called true diverticula. False diverticula are those in which only the submucosa and mucosa protrude, the muscularis having ruptured. Structural weakness, trauma and infection are important etiologic factors in acquired diverticula. Congenital diverticula are disputed. Treatment should be surgical extirpation. Suprapubic cystostomy is usually unnecessary. Use of the electrocautery is dangerous and may lead to poor end results.

American Journal of Physiology, Baltimore

127: 605-806 (Nov.) 1939. Partial Index

- Effect of Faradic and Galvanic Stimulation on Course of Atrophy in Denervated Skeletal Muscles. E. Fischer, Richmond, Va.—p. 605.
- Qualitative Study of Normal Gonadotropin. F. E. D'Amour, Denver.—p. 649.
- Origin of Respiratory Rhythmicity. R. F. Pitts, H. W. Magoun and S. W. Ranson, Chicago.—p. 654.
- Selective Vascular Reaction Patterns in Nasal Septum and Skin of Extremities and Head. A. B. Hertzman and J. B. Dillon, St. Louis.—p. 671.
- Glucose and Lactic Acid Exchanges During Hypoglycemia. H. E. Himwich, J. F. Fazekas and Sarah Nesin, Albany, N. Y.—p. 685.
- Effect of Ingestion of Glycine, With and Without Urea, on Creatinine Excretion in Rat and Man. H. H. Beard, Julia K. Espenan and P. Pizzolato, New Orleans.—p. 716.
- Relation of Blood Pressure and Concentration in Serum of Potassium, Calcium and Magnesium. H. E. Hoff, P. K. Smith and A. W. Winkler, New Haven, Conn.—p. 722.
- Diodrast Clearance and Renal Blood Flow in Normal Pregnant and Nonpregnant Women. L. C. Chesley and Elizabeth R. Chesley, Jersey City, N. J.—p. 731.
- Ketone Body/Total Carbohydrate Utilization Ratios and Their Relation to the Problem of Ketosis. J. A. Dye and Jane L. Chidsey, Ithaca, N. Y.—p. 745.
- Venous Return as Factor Affecting Vital Capacity. P. Dow, Augusta, Ga.—p. 793.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 481-636 (Oct.) 1939. Partial Index

- Examination of Larynx and Adjacent Structures with Intrapharyngeal Films. A. Hartung and J. W. Grossman, Chicago.—p. 481.
- Intra-Oral Minor Salivary Gland Adenocarcinoma. J. E. Wirth, Seattle.—p. 508.
- Aspiration Biopsy of Tumors in Obscure or Difficult Locations Under Roentgenoscopic Guidance. J. V. Blady, New York.—p. 515.
- *Removal of Lipiodol After Myelography. H. V. Briesen, Los Angeles.—p. 525.
- Roentgen Treatment of Primary Inoperable Carcinoma of Breast. J. A. L. McCullough, E. T. Leddy and A. U. Desjardins, Rochester, Minn.—p. 534.
- Irradiation Keratoses and Carcinoma. J. J. Duffy, New York.—p. 540.
- Radium Treatment of Peyronie's Disease. R. E. Fricke and J. W. Olds, Rochester, Minn.—p. 545.
- Roentgen Therapy of Cystic Hygroma of Neck in Children. F. M. Hodges, L. O. Snead and R. A. Berger, Richmond, Va.—p. 551.
- Low Voltage Lightly Filtered Roentgen Radiation versus Radium and High Voltage Roentgen Radiation in Treatment of Superficial Cancer. L. R. Cowan, Salt Lake City.—p. 556.
- Treatment of Encephalitis with Roentgen Ray: Preliminary Report. S. Rubinfeld and A. Wolf, New York.—p. 561.
- Clinical Symptoms Useful as Guide for Roentgen Therapy. W. L. Ross, Omaha.—p. 565.
- Rhythm of Radiation Effects: Further Studies of Protracted External Irradiation in Treatment of Neoplasms of Upper Respiratory Tract. M. Friedman and Rieva Rosh, New York.—p. 572.

Removal of Iodized Oil After Myelography.—Briesen believes that the procedure which he used for removing iodized oil after myelography dispenses with one of the major objections to performing myelography. After x-ray examination was done and the roentgenograms were developed his patient was taken to the operating room in a sitting position. With the area under local anesthesia an incision was made over the upper spines of the sacrum, the interspinous ligament was removed, a drill hole of one-eighth inch was placed in the sacrum and a trocar was inserted. No material would flow through the trocar, but when the trocar was removed the oily material flowed slowly, like cold syrup. Nothing seemed to hurry it. However, by means of a small probe and by allowing the material to run over the wound and into a cup, it was kept flowing until spinal fluid was obtained. The spinal fluid was allowed to run until there appeared to be no more globules of oil in it. The wound was then closed in a routine manner. The length of time that it took for the iodized oil to run out was approximately one hour, and consequently the patient suffered considerable pain and discomfort, as he was sitting up all this time. His recovery from this procedure was uneventful, and roentgenograms taken several days later showed at least a 90 per cent removal of the iodized oil. The author states that on inquiry as to the complete removal of the oil Adson suggested: "Have the patient sit upright in a chair for an hour before proceeding with its removal in order that all the lipiodol will be concentrated in the caudal sac. The operating table is then adjusted so that the head of the table is much higher than the foot, after which the patient is placed on his abdomen with the feet resting against the foot piece and the hands strapped along the side. In such a position, the lipiodol is constantly kept in the caudal sac."

Archives of Ophthalmology, Chicago

22: 727-946 (Nov.) 1939

- *Local Use of Vitamin A Preparations in Ophthalmic Practice. S. de Grösz, Budapest, Hungary.—p. 727.
- *Treatment of Tuberculosis of Anterior Portion of Eye with Beta Rays of Radium. A. C. Woods, Baltimore.—p. 735.
- Hyperphoria Tests Based on New Principle. F. H. Verhoeff, Boston.—p. 743.
- Plexiform Neurofibromatosis (Recklinghausen's Disease) of Orbit and Globe, with Associated Glioma of Optic Nerve and Brain: Report of Case. F. A. Davis, Madison, Wis.—p. 761.
- Slit Lamp Observations During Experimental Intracapsular Extraction of Cataract. J. Goldsmith, New York.—p. 792.
- *Bilateral Detachment of Retina: Heredodegenerative Disease. A. de Rötth, Spokane, Wash.—p. 809.
- Betts Visual Sensation and Perception Tests: Method of Detecting School Children Requiring Ocular Attention. Lura Oak and A. E. Sloane, Boston.—p. 832.
- Extraction of Subluxated Lens by Lever Action Intracapsular Method. K. C. Dutt, Sonpur Raj, India.—p. 844.
- Ocular Reactions to Diphtheroid Bacilli. H. Lucic, Baltimore.—p. 849.
- Detecting, Measuring, Plotting and Interpreting Ocular Deviations. W. B. Lancaster, Boston.—p. 867.

Local Vitamin A for Ocular Disorders.—The local application of vitamin A in the treatment of injuries to and trophic conditions of the cornea is outlined by de Grösz. The vitamin A preparation is called vulnovitan (an oil or an ointment with petrolatum base) and 1 cc. of the oil contains 1,000 international units of vitamin A. As far as injuries are concerned, this therapy is extremely useful in promoting epithelization of fresh corneal lesions (as in erosions after extraction of foreign bodies) and it has a powerful analgesic effect, though it does not surpass ethylmorphine hydrochloride. The eye is bandaged. For injuries of the eyelid for which sutures are not necessary, the ointment (1 Gm. contains 500 international units of vitamin A) is used. Other conditions for which the ointment is indicated are torpid ulcerous and scrofulous blepharitis, though for the former a better reaction is obtained with roentgen irradiation. Though one cannot expect the anti-infectious factor of vitamin A to have a disinfecting action since it is not bactericidal, there is a rise of local resistance. However, if infection is feared or if signs of infection are already present, disinfecting agents should be used and foreign protein (milk) injected or sulfanilamide given. The vitamin A preparation has a good effect on injuries and burns of the conjunctiva, for after thorough rinsing of the culdesac its application prevents the formation of adhesions by hastening epithelization of the conjunctiva. The author has used vulnovitan (oil) for the treatment of caustic burns caused by lime and sodium hydroxide and also for injuries caused by indelible pencil, the eye first being rinsed with a 1 per cent solution of hydrogen peroxide. He states that vulnovitan is absolutely indicated for injuries due to gases used in industry and in warfare because of its analgesic and lubricating effect. Some of the other conditions in which he found vulnovitan to be beneficial are corneal inflammation, torpid ulcers, recurrent erosion, bullous keratitis, neuroparalytic keratitis, Fuchs's epithelial dystrophy, filamentous keratitis, corneal degeneration of obscure etiology, acute photo-ophthalmia, superficial punctate keratitis, radium necrosis of the cornea, keratitis due to mustard gas and trachomatous pannus. There is no indication for vitamin A therapy for acute or chronic catarrh, scleritis or deep keratitis. Local application of vitamin A not only helps but accelerates epithelization; it is truly a protective agent for the epithelium. The rise of the resistance is only a secondary phenomenon. To eliminate tolerance, over-dosage must be avoided. Vitamin A in oil should be purchased in small amounts (ampules) because, owing to its unstableness, it readily loses its effectiveness as the result of oxidation, once the container is opened. The excipient itself also has adhesive and protective characteristics. The use of ethylmorphine hydrochloride is not superfluous when one is applying vitamin A. The vitamin A is applied from three to five times a day and can be used with or without a bandage; a supplementary treatment can be given also. Heat in the form of short wave irradiation and infra-red irradiation should be given to aid resorption of vitamin A.

Beta Rays of Radium for Ocular Tuberculosis.—Woods used the beta rays of radium for the treatment of ten patients with tuberculous kerato-iritis and of three with deep tuberculous scleritis. There was prompt subsidence of all inflammation after one course of treatment, although two of the patients

with tuberculous keratitis had recurrences. These were again controlled by further irradiation. Deep scleritis was more resistant, steady treatment over a greater period of time being required before any decided improvement occurred. One patient showed improvement and final healing of the scleritis after steady treatment for eight months. The second patient, who was blind in one eye because of an atrophic choroiditis, had a marked scleral ectasia at the site of the scleritis. Under repeated courses of beta irradiation, extending over two years, there was definite and steady improvement with almost complete subsidence of the ectasia. This patient had been under observation for the preceding five years and had grown steadily worse in spite of all local and general treatment, including repeated paracentesis and tuberculin therapy. The third patient showed temporary improvement after only one course of treatment but had a relapse on returning to her home in a distant state.

Bilateral Detachment of Retina.—According to de Rötth, from January 1930 to June 30, 1938, there were 270 patients treated for retinal detachment at the State Eye Hospital in Budapest. Only a few of them have not been subjected to operation. Of thirty-three, or 12.2 per cent, the detachment was bilateral; twenty-three were men and ten women. The average age of patients when detachment developed in the first eye was 39 years and in the fellow eye 44. Forty-two per cent of the patients were young persons up to 30 years of age. Every type of retinal hole was observed, but each eye always showed the same type of hole as its fellow. In addition to the type being the same, the holes occurred mostly at a symmetrical part of the retina. The occurrence of binocular detachment, especially its uniformity in the two eyes, supports the view of Vogt concerning the pathogenesis of this disease, that disposition to develop a hole is a consequence of presenile and senile degeneration of the retina, vitreous, choroid and vessels. The disposition is a congenital property of the germ plasma. The author goes further and considers one group of binocular detachments as a primary heredodegenerative disease which does not depend on senility. The probability of heredodegeneration is supported by the occurrence of familial detachment in two brothers and a sister. The disease seems to be caused by abiotrophy—heredodegeneration of the retina, as in systemic degeneration of the nervous system. The retina as a portion of the central nervous system may also have a predisposition to degeneration lying in the genotype. The horseshoe-shaped or lobular holes are almost always combined with myopia and with degeneration of the vitreous. In these cases the mechanical effect, pulling by the vitreous, may also be a factor aside from the degeneration of the retina. In the small degenerative round holes a vascular degeneration is mostly present, i. e. a condition due to trophic disturbance; according to Vogt's theory, primary damage occurs in the vessels, not in the retina as is supposed in the other biotypes. The single biotypes do not transform into one another; each begins in its typical form.

Archives of Otolaryngology, Chicago

30: 689-862 (Nov.) 1939

- Experiences with Fistulization of Labyrinth in Chronic Progressive Deafness: Report of Cases. E. H. Campbell, Philadelphia.—p. 689.
End Results of Intranasal Operation for Maxillary Sinusitis. B. E. Hempstead, Rochester, Minn.—p. 711.
End Results of Intranasal Operations on Ethmoid, Frontal and Sphenoid Sinuses. E. R. Faulkner, New York.—p. 716.
End Results of External Operations on Maxillary Sinus. S. Salinger, Chicago.—p. 721.
End Results of External Operations on Frontal, Ethmoid and Sphenoid Sinuses. M. F. Arbuckle, St. Louis.—p. 736.
Atresia of External Auditory Meatus: Canalization by Electrocoagulation. J. N. Novick, Washington, D. C.—p. 744.
Short Wave Diathermy in Treatment of Nasal Sinusitis. A. R. Hollender, Miami Beach, Fla.—p. 749.
Treatment of Acute Suppurative Otitis Media: Does Douching of Ear Spread Infection to Mastoid Cells? O. C. Hirst, Philadelphia.—p. 755.
Benign Cysts and Adamantinomas of Jaws. F. Z. Havens, Rochester, Minn.—p. 762.
"Functional" Loss of Hearing Following Injuries to Head. M. Rosenthal, New York.—p. 775.
Purulent Otitis Media, Mastoiditis, Sinus Thrombosis and Suppuration of Petrous Pyramid. S. J. Kocetzky, New York.—p. 800.

Short Wave Diathermy for Sinusitis.—With a view to correct evaluation of short wave diathermy in the treatment of disease of the nasal sinuses, Hollender repeated the temperature studies of Andreen and Osborne and of Rosenwasser and Bierman. In twenty cases of acute exacerbation of maxillary sinusitis

in which the taking of temperatures through a window was feasible, the following results were obtained: In ten there was an elevation of temperature ranging from 0.6 to 1.5 degrees F., in four there was no gain or loss and in the remaining six there were losses ranging from 0.4 to 1 degree F. The treatments were given with air-spaced electrodes over the affected antrum for periods of fifteen minutes, and in all cases the same apparatus was employed. In a second series of eighteen cases of acute maxillary sinusitis, short wave diathermy (from a 6 meter apparatus) was applied without resort to any other treatment. In a control group orthodox procedures were employed without short wave diathermy, and in a third group short wave treatment was added to accepted routine measures. In the first group, after four days, six of the patients had to be given relief by irrigation, shrinkage and suction. The most unfavorable result was obtained in the group treated by short wave diathermy alone. The most favorable response was obtained in the third group, in which short wave treatment was combined with routine treatment of the sinuses. In a third series of fourteen selected cases of chronic maxillary sinusitis (inflammatory and suppurative but not definitely hyperplastic), in which there had previously been numerous nonsurgical methods of treatment, diathermy was tried over a period of a year to evaluate its effectiveness. Seven of the patients were treated with diathermy alone and seven had the benefit also of intranasal and constitutional remedies. Of the first seven patients only one showed moderate improvement; in the other group of seven, two showed a decided favorable change and only one slight improvement.

Head Injuries and Loss of Hearing.—In defining functional loss of hearing from an industrial angle, Rosenthal assumes that ordinary conversation is carried on within the frequencies 256, 512, 1,024 and 2,048 double vibrations. He bases his deduction on the loss in decibels for these frequencies and calls it functional loss. Of nineteen patients examined after head injuries within a day or two after admission to Gouverneur Hospital or as soon as they became oriented, functional loss of hearing ensued in two. The trauma most often occurred in the basal coil of the cochlea with impairment for perception of the higher frequencies, above 2,048 double vibrations, which does not by itself produce "functional" loss of hearing. Concussion was diagnosed by the neurologist in all nineteen cases, unconsciousness was observed in fifteen, fracture of the skull was shown roentgenographically in five, and the complaint of vertigo (nausea, vomiting and dizziness) was made in six. Loss of hearing for the higher frequencies was diagnosed in nine, in three of which it was bilateral. In the two cases in which there was loss of hearing within the "functional" range, the loss was unilateral.

Arkansas Medical Society Journal, Fort Smith

36: 123-148 (Nov.) 1939

- Postoperative Care of Average Patient Following Abdominal Operation. G. V. Lewis, Little Rock.—p. 123.
Treatment of Chronic Empyema in Children. H. Shipp, Little Rock.—p. 126.
Your State Hospital. N. T. Hollis, Little Rock.—p. 128.

Journal of Experimental Medicine, New York

70: 443-542 (Nov.) 1939

- *Radioactive Iron and Its Excretion in Urine, Bile and Feces. P. F. Hahn; W. F. Bale; R. A. Hettig, Rochester, N. Y.; M. D. Kamen, and G. H. Whipple, Rochester, N. Y.—p. 443.
Experimental Production of Digestive Tract Ulcerations. A. Penner and Alice Ida Bernheim, New York.—p. 453.
Method for Study of Induced Interference with Transplantable Tissue Growth. D. A. MacFadyen and J. B. Murphy, New York.—p. 461.
Inhibition of Transplantable Mouse Tumor Growth by Tissue Extracts and Their Protein Fractions. D. A. MacFadyen, E. Sturm and J. B. Murphy, New York.—p. 475.
Experimental Meningococcal Infection of Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 485.
Pathogenesis of Meningococcal Meningitis in Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 499.
Study of Passive Immunity to Meningococcal Infection in Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 511.
Nature of Pressor Action of Renin. I. H. Page, Indianapolis.—p. 521.

Excretion of Radioactive Iron.—Hahn and his collaborators studied the iron excreted in the urine, bile and feces of dogs given radioactive iron as ferrous gluconate by vein. In summary they state that there is an initial extra output of iron in the urine and feces for a few days (from three to fifteen) after its injection, and this may total from 2 to 8 per cent of

the injected iron. Following this initial reaction the urinary excretion of radioactive iron drops to traces or even to zero. The feces always contain measurable amounts; in five dogs receiving from 100 to 250 mg. the daily fecal excretion settled down to from 0.05 to 0.4 mg. Blood destruction (acetyl phenylhydrazine) caused a definite increase in radioactive iron eliminated daily in the feces (from 0.1 to 1 mg.). Probably most of this excess of iron came through the biliary tract (bile fistula). The bile under usual conditions contributed but little iron to the intestine (0.01 mg. or less of radioactive iron daily). The body controls its iron stores by absorption or lack of it rather than by the capacity to eliminate it. The evidence is overwhelming that the dog excretes iron with difficulty and in small amounts (even in the plethoric state) by means of the biliary and gastrointestinal tracts.

Journal Industrial Hygiene & Toxicology, Baltimore

21: 321-438 (Oct.) 1939

*Chronic Exposure to Benzene (Benzol): I. Industrial Aspects. M. Bowditch and H. B. Elkins, Boston.—p. 321.

*Id.: II. Clinical Effects. F. T. Hunter, Boston.—p. 331.

*Id.: III. Pathologic Results. T. B. Mallory, E. A. Gall and W. J. Brickley, Boston.—p. 355.

Benzene (Benzol) Poisoning in Rotogravure Printing Industry in New York City. L. Greenburg, May R. Mayers, L. Goldwater and Adelaide R. Smith, New York.—p. 395.

Hematologic Effects of Benzene (Benzol) Poisoning. L. A. Erf and C. P. Rhoads, New York.—p. 421.

Industrial Aspects of Chronic Exposure to Benzene.—

Bowditch and Elkins discuss the industrial aspects of continued exposure of workers to benzene (benzol) in several artificial leather plants. Eighty-five workers were examined. There were thirteen serious cases of benzene poisoning, with recovery in only two. The authors made thirty-six urine sulfate ratio determinations and a total of eighty-four atmospheric air analyses. Benzene vapor determinations were made chiefly by the volumetric method developed by Smyth. These tests were made in plants in which relatively good control was maintained. The benzene exposure was as a rule obtained by averaging the results of all vapor determinations made in the given worker's area. These urine samples were taken near the end of the working day, after at least six hours of exposure. The time of day at which the sample is taken is very important, as in every case except that of one worker the ratio of the afternoon sample was more than 20 per cent lower than that of the forenoon sample. The principal two processes involving benzene exposure are the mixing of a nitrocellulose dope, carried out in the compounding room, and the coating of fabric therewith, done in the coating room. There have been eight known recent cases of benzene poisoning terminating fatally in three artificial leather plants. In these plants there were, in all, about sixty workers exposed to benzene vapor in concentrations ranging from 100 to more than 200 parts per million. The compounding room is their chief source of exposure. In three other plants of this type in which the maximal average exposure was judged to be 100 or less parts per million there have been no fatalities. Two plants using benzene rubber cements in the manufacture of crape rubber soles for shoes showed naphtha vapor concentrations of from 300 to 1,300 parts per million. The poisoning cases in these plants, involving women, occurred after relatively short exposures to apparently high concentrations of benzene vapor. In the artificial leather establishments, on the other hand, the exposures have in all cases been longer and, as a rule, less severe. From determinations of atmospheric benzene concentrations in the various shops the data show that the commonly accepted maximal allowable concentration for benzene vapor is 100 parts per million, although Greenburg reported a definite hazard in even lower concentrations. On the other hand, 50 per cent has been proposed as the limiting safe value for the urine sulfate ratio. These two standards are not correlative. A 50 per cent urine sulfate ratio, based on a single sample taken at the end of the working day, would probably correspond to an average benzene vapor concentration of slightly below 75 parts per million. This value has been proposed as the maximal allowable concentration by the Massachusetts Dust and Fume Code Committee and, in the light of their experience,

seems to the authors not unduly restrictive. While they have found that benzene vapor concentrations may readily be kept below 75 parts per million in the majority of industrial processes involving its use, this is not true of all such operations. The fatal outcome to two workers who the authors believe were exposed to average concentrations well below 75 parts per million indicates the possibility of occasional cases of benzene poisoning with even the best of control. Close medical supervision of all benzene workers is thus most important and it is to be hoped that adequate substitute materials will be developed for the more hazardous industrial uses of this excellent solvent.

Clinical Effects of Chronic Exposure to Benzene.—

The clinical effects on eighty-nine individuals exposed to various concentrations of benzene fumes were studied by Hunter, who gathered the material during the last four years. His study included the history, physical examination, routine urine and serologic tests and complete laboratory tests of the blood of each person. In addition, in several instances gastric analyses, cell volume and sedimentation rate determinations were carried out. Furthermore, a diagnostic biopsy of the sternal marrow was performed on certain patients, and in eight of the ten fatal cases a postmortem examination was made. Depending on the degree and duration of exposure, an analysis of the blood indicates that benzene may bring about polycythemia or anemia, leukocytosis or leukopenia, leukemia or leukemoid blood pictures (either lymphatic or myeloid), eosinophilia, megalocytosis or microcytosis, and the presence of immature marrow elements in an otherwise normal blood. The early diagnosis of poisoning depends on an evaluation of the complete blood picture rather than on the existence of a leukopenia. Individual susceptibility is so varied and complex that it seems impossible, at least at present, to explain why one individual is poisoned by the same concentration of fumes—all other extrinsic factors being equal—and another is not. As benzene is a fat solvent, perhaps variations in the quantity of blood lipoids control the amount taken up and held in solution. Thus these substances may play a part in poisoning. If true, this may explain and confirm in part the hypothesis that certain foods act in a protective manner. However that may be, poisoning is certainly a product of three factors: the degree of individual susceptibility, the duration of exposure and the concentration of fumes. Therefore, concentration has a relative but not an absolute importance. Splenomegaly may appear in protracted cases of poisoning. Women are no more susceptible to poisoning than men, and acclimatization to the fumes does not seem to occur. The first signs of poisoning may appear with the onset of an infection, long after exposure has ceased. It is doubtful whether any concentration of benzene greater than zero is safe over a long period.

Journal of Pediatrics, St. Louis

15: 469-612 (Oct.) 1939. Partial Index

Nitrogen Metabolism During Oral and Parenteral Administration of Amino Acids of Hydrolyzed Casein. A. T. Shohl, A. M. Butler, K. D. Blackfan and Elsie MacLachlan, Boston.—p. 469.

*Chronic Stridor in Infancy. J. E. Bowman and C. L. Jackson, Philadelphia.—p. 476.

Determination of Vitamin C in Children by Intradermal Injection. H. G. Rapaport and S. H. Miller, New York.—p. 503.

Some Problems of Diphtheria Immunization. M. M. Hillman and J. I. Linde, New Haven, Conn.—p. 513.

*Treatment of Cryptorchidism with Male Sex Hormone. C. Zelson and E. Steinitz, New York.—p. 523.

Traumatic Rupture of Spleen in Children, with Special Reference to Left Shoulder Pain. Nina A. Anderson, Cincinnati.—p. 535.

*Erythema Infectiosum: Clinical Observations During an Epidemic. J. M. Rector, San Francisco.—p. 540.

Amyotonia Congenita (Oppenheim's Disease) Occurring in Two of Triplets. A. Gourse, Sacramento, Calif.—p. 546.

Amyoplasia Congenita (Arthrogryposis Multiplex Congenita). H. S. Altman and L. T. Davidson, New York.—p. 551.

Pneumococci (Type III) Meningitis with Recovery. S. H. Welch and H. F. Martin, Birmingham, Ala.—p. 563.

Simplified Method for Scalp Vein Transfusions in Infants. S. A. Kauffman and S. O. Levinson, Chicago.—p. 574.

Chronic Stridor in Infancy.—Bowman and Jackson investigated the causes of stridorous breathing of thirty consecutive infants observed during a period of five years. They found that fourteen of the infants had supraglottic obstruction to inspiration due to deformity or flaccidity of the epiglottis, arytenoids

and/or aryepiglottic folds. Of children who have this difficulty, the epiglottis and arytenoids, forming the upper rim of the larynx, are drawn over the entrance of this organ on inspiration to produce the stridor. Characteristically, in these cases the onset of the noisy breathing was at birth. In five of the cases in which there was noisy breathing, pressure on the trachea was caused by an enlarged thymus gland. Diagnosis in these instances depended a great deal on the observation, on a lateral roentgenogram, of kinking, narrowing and displacement backward of the trachea by a shadow posterior to the manubrium of the sternum. More weight was given to any of these changes when they were observed during full inspiration. Results of endoscopic examinations were negative in all these cases. Before classifying a child in this group, definite improvement in the stridor had to take place forty-eight hours after roentgen treatment. The onset of the symptom in this group was at the second or third month, and the stridor was more marked on expiration. Three of the infants were stridorous because of congenital malformations of the larynx other than those present in the first group. One had weblike ridges in the subglottic area, one a thickening of one of the ventricular bands and one a congenitally small larynx. In each of the eight remaining cases the diagnosis was different: cyst of the thyroglossal duct with pressure on the larynx, tuberculosis of the bronchial lymph nodes, micrognathia, collapse of part of the trachea, congenital heart disease, hypertrophic laryngitis, hypertrophic laryngitis associated with congenital laryngeal stridor; in one case the cause of the altered breathing was not determined. The thirty patients were examined roentgenologically for enlargement of the thymus gland, and twenty-one were found to have some degree of enlargement. Only five infants with enlarged glands were definitely improved after roentgen therapy, while five others were temporarily benefited. Of the nine with thymus glands of normal size there was no change of the symptoms in seven and two were not treated. All these facts reaffirm the difficulty of estimating the importance of this troublesome diagnosis in cases studied because of noisy breathing. Satisfactory study of a child with stridor should include careful x-ray examination of the neck and chest in both planes and an endoscopic examination of the larynx and trachea.

Testis Hormone for Cryptorchidism.—Zelson and Steinitz used the testis hormone in the treatment of twenty cryptorchid boys between $7\frac{1}{2}$ and 13 years of age. Eleven of the twenty children had had previous treatment with gonadotropic substance with no effect. At no time in the past history of the children had the undescended testicle been seen or felt in the scrotum. There was a total of twenty-three undescended testicles; thirteen were palpable and ten were not. Each child was given synthetic testosterone propionate three times a week for from four to ten weeks; the doses varied between 5 and 10 mg. per injection. Four of the boys received a second series of injections of testosterone propionate 5 mg. three times a week in combination with gonadotropic substance (pregnyl) 500 units three times a week for from three to six weeks. The total dosage of gonadotropic substance varied between 4,000 and 8,900 units. None of the children received treatment for longer than ten weeks. Of the eleven boys who had been previously treated with gonadotropic substance two responded to the testosterone treatment: one was affected unilaterally and the other bilaterally; in both the type was pseudo-Froehlich. There was complete descent of testicles in three boys. Of these three, one had unilateral cryptorchidism and two bilateral. Testosterone propionate had a partial effect on some of the other children treated: The testicles of five came down to the lower end of the canal and could be pulled out of the external ring manually but retracted immediately when left alone. The testicles of four which were not palpable at the onset of the treatment became palpable in the canal at the end of treatment. Sixteen boys had enlargement of the penis, eight had enlargement of the scrotum and ten had a definite growth of pubic hair. Only four of the boys showed no effect from the testis hormone. The testicles of five boys became smaller during the course of treatment. In one they became larger. In a four week period one boy grew half an inch in height and another grew 1 inch. Though frequent erections

were reported during the course of treatment, there was no discomfort and no history of masturbation. Of the four boys (having unilateral undescended testicles) who had not responded to the testosterone propionate alone and were given a second course of treatment combined with gonadotropic substance, two responded to this treatment with complete descent. One boy with bilateral cryptorchidism for which testosterone propionate was not effective was subsequently given 10,000 units of gonadotropic substance with resultant complete descent of the testicles. The authors conclude that gonadotropic substance is more effective than testis hormone for the treatment of cryptorchidism. However, when there is no response to gonadotropic substance alone a combination of gonadotropic substance and testis hormone will often cause a response.

Erythema Infectiosum.—The characteristics and general course of an epidemic of forty-three cases of infectious erythema are described by Rector, who believes that from a public health standpoint, because of its contagious nature, it would seem advisable to create a place for erythema infectiosum on the official list of reportable diseases. All the available communications on erythema infectiosum report group infections, although the small size, short duration and relative infrequency of these epidemics point either toward a limited degree of contagiousness or to a lack of general susceptibility to the disease. The epidemics usually attain a peak by the third or fourth week and then subside with equal rapidity, the total duration being but a few months or less. While only 128 cases in the San Francisco epidemic were brought to the attention of the department of health the actual morbidity was much greater, as it is not a reportable condition. Further, many of the initial cases were not recognized, while others were so mild that they were overlooked. Sporadic cases are still occurring in San Francisco. Transmission apparently results from a droplet infection, but the specific agent remains unknown. There is a seasonal incidence, the malady being most frequent in the spring. The age group most commonly affected is from 4 to 12 years. There appears to be a decided sex predilection, girls being more often afflicted in a ratio sometimes as high as 2:1. In one San Francisco school all the cases observed were of girls. The incubation period has been reported to be from five to fourteen days. Among the forty-three cases studied by the author the average period of incubation was from seven to eleven days. Occasionally there is a mild prodrome with slight malaise and sore throat, but in the vast majority of cases the rash, making its initial appearance on the cheeks, is the first and only symptom noted. Within twenty-four to thirty-six hours the eruption develops on the trunk and extremities and spreads toward the periphery, the hands and feet being the last portions of the body to be affected. Whereas the eruption disappears rapidly from the face and trunk, it may last from six to fourteen days on the extremities and an interesting evanescence is often seen, the rash fading for hours or days and then reappearing, usually after slight dermal irritation. Subjective symptoms are practically nil. There is no adenopathy or splenomegaly, and the eruption is not followed by desquamation or pigmentation. Moderate leukopenia with relative lymphocytosis and eosinophilia is usually found. The eosinophils vary from 1 to 16 per cent and average from 4 to 6 per cent. Erythema infectiosum is to be differentiated from the other acute exanthems, from erythema exudatum multiforme and from the various urticarial dermatoses arising from foods, drugs and external irritants. In those occasional cases in which the eruption fails to become confluent on the face, German measles may be suspected until the characteristic features of the disease become evident. In sporadic cases confusion with erythema multiforme or urticaria may occur if the rash is present only on the extremities. Here a negative history, asymptomatic course, absence of pruritus, relatively long duration of the eruptive stage and normal sedimentation rate will all assist in determining the true nature of the condition. Aside from mild symptomatic measures, no treatment is required. As the condition is infectious, the patient should be isolated until the eruption has disappeared permanently. Susceptible contacts should be restricted for two weeks.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

20: 371-438 (Oct.) 1939

- Serologic Identification of Clostridium Tetani. J. D. Maclellan.—p. 371.
Virus-Inactivating Agent from Human Nasal Secretion. F. M. Burnet, Dora Lush and A. V. Jackson.—p. 377.
Adrenalin Content of Suprarenal Glands in Diphtheria Intoxication. C. A. Ashford.—p. 385.
Neutralization of "Purified" Tumor Agent Suspensions by Antifowl Serum. R. Knox.—p. 391.
Nutrition of Corynebacterium Diphtheriae: Pantothenic Acid as Essential Growth Factor for Certain Strains of Corynebacterium Diphtheriae Gravis: Synthesis of Some Physiologically Active Compounds by Corynebacterium Diphtheriae Cultures in Synthetic Mediums. W. C. Evans, W. R. C. Handley and F. C. Happold.—p. 396.
*Studies in Lead Mobilization. S. L. Tompsett and J. N. M. Chalmers.—p. 408.
Polypeptide Responsible for Some of Phenomena of Acute Inflammation. E. S. Duthie and E. Chain.—p. 417.
Chemical Composition of Active Agent of Rous Sarcoma No. 1 and of Some Related Products. A. Pollard.—p. 429.

Lead Mobilization.—Tompsett and Chalmers studied the effect of high (2.7 Gm. daily) and low (0.13 Gm. daily) calcium diets with and without ammonium chloride in lead poisoning of six lead workers, increased lead absorption in three cases due to lead-contaminated drinking water and one case of lead poisoning due to the latter cause. High calcium diets produced a fall in blood lead, while low calcium diets with and without ammonium chloride produced a rise in blood lead. There was no parallelism between the level of blood lead and lead excretion in the two cases examined. The effect of high and low calcium diets on the distribution of lead between the soft tissues and the skeleton in mice has been studied and it was found that high calcium intakes transfer lead from the soft tissues to the skeleton, while with low intakes the reverse is true.

British Medical Journal, London

2: 841-896 (Oct. 28), 1939

- Prophylactic Immunization Against Measles, Scarlet Fever, Diphtheria, Whooping Cough and Influenza. J. C. G. Ledingham.—p. 841.
Ophthalmic Services to Civil Population in National Emergency. A. Irvine-Fortescue.—p. 846.
Transfusion with Stored Blood. J. C. Leedham-Green.—p. 849.
*Choice and Preparation of Blood-Grouping Serums for Emergency Purposes. S. W. Challinor, J. C. J. Ives and C. E. van Rooyen.—p. 850.
Severe Uterine Inertia Treated by Cutting Cervix. J. V. O'Sullivan.—p. 852.

Blood-Grouping Serums for Emergency Purposes.

With the aid of a small quantity of blood-grouping serums, Challinor and his co-workers selected four human volunteers of group II and four of group III. The object was to find out which of them could provide the most active serums for standard typing purposes in emergencies. By setting up a series of increasing dilutions of each individual's serum, to which was added a suspension of erythrocytes, it was possible to determine which of the serums produced clumping in the highest dilution and to ascertain the character and nature of the clumping produced. The results showed that the serum possessing the highest end titer of agglutinins was not necessarily the serum of choice for typing purposes, since the qualitative character of the reaction—for example the size and appearance of the clumps as seen by the naked eye—was a better criterion of the value of serums for typing work than the end titer at which the reaction occurred. It is desirable to add a preservative to typing serum, and phenol was used in order to avoid excessive dilution of the serum. The most suitable two donors from each group were chosen and from half to three fourths of a pint (240 to 360 cc.) of blood was withdrawn from each donor into sterile pint bottles and allowed to stand overnight in the ice box. During this preliminary storage the absorption of any "cold" agglutinins takes place. The separated serum was transferred by means of sterile pipets into sterile 100 cc. bottles. In order to maintain sterility, phenol (5 per cent aqueous solution) was then added to the serum so that the phenol concentration was 0.5 per cent. For distribution purposes the phenolized serum was transferred in 1 cc. quantities to sterile vials fitted with rubber bungs, which were afterward waxed. As an alternative method for the preservation of typing serums the authors used the method employed by Craigie (1931) and Craigie and Tulloch (1931). This is

the preservation of serums by desiccation in vacuo from the frozen state. The only disadvantage of using dried serum is that larger quantities are required than of the fluid serum; but this disadvantage is offset by the fact that desiccated serum is easily distributed and handled, and, in any case, the actual amount of dried serum needed for a typing test is exceedingly small.

Lancet, London

2: 865-920 (Oct. 21) 1939

- Profession of Surgery. V. Z. Cope.—p. 865.
Antitumorigenic Action of Testosterone. A. Lipschütz, L. Vargas and O. Ruz.—p. 867.
*Pathogenic Staphylococci: Their Incidence in Nose and on Skin. E. H. Gillespie, E. A. Devenish and S. T. Cowan.—p. 870.
Pancreatic Lithiasis. W. F. Brook.—p. 873.
*Vitamins D₂ and D₃ in Infantile Rickets: Comparison of Their Therapeutic Efficiency. N. Morris and Mary M. Stevenson.—p. 876.
Effects of Drugs in Myotonia. E. Guttman and A. B. Stokes.—p. 879.
Control of Gastric Acidity in Peptic Ulcer. B. M. Nicol.—p. 881.
Prognosis in Rabies. J. H. Jordan.—p. 884.

Pathogenic Staphylococci in Nose and on Skin.—Gillespie and his associates point out that during an investigation of an outbreak of septic infections in operative wounds Devenish and Miles found that three of four surgeons tested were nasal carriers of *Staphylococcus aureus*. One of these three was a persistent cutaneous carrier of a strain of *Staphylococcus aureus* identical with the nasal strain. Since there appears to be no record of any survey of the incidence of staphylococci both in the nose and on the skin in which the cocci were identified as potentially pathogenic, Gillespie and his associates determined the nasal and cutaneous carrier rates in medical students. Two surveys were made. In the first, swabs were made of 159 students. Of the 159 nasal swabs, sixty-nine were positive, a nasal carrier rate of 43.4 per cent. There were thirty-one (19.5 per cent) cutaneous carriers (right or left wrists or both). The total population may be conveniently divided into four groups: group A are nasal carriers, B double carriers, C cutaneous carriers and D noncarriers. Approximately 50 per cent are carriers of *Staphylococcus pyogenes*, which in 30 per cent occurs only in the nose, in 13 per cent in the nose and on the skin—double carriers—and in only 7 per cent on the skin alone. There was no relation between the carrier rates and the length of the students' sojourn in the hospital, nor was there any association with the age or sex of the student. Regarding the nasal carrier state and the history of chronic nasal disease, the authors say that of the population sampled thirty-nine gave a history of chronic nasal disease in the form of discharge, chronic catarrh or sinusitis; twenty-five of these were nasal carriers of *Staphylococcus pyogenes*. The percentage difference between the incidence of nasal disease in nasal carriers and in the remainder of the students is 20.7 ± 6.9 , suggesting that there is an association between the two conditions. About the relationship of nasal and cutaneous carrier states and infections of the skin, the authors say that several of the persons tested had a history of superficial cutaneous infections, such as boils or pustules. The positive carriers showed a slightly higher percentage of cutaneous infections, but the difference is not statistically significant. The second survey, made several months later, was designed to test the constancy of the nasal and skin carrier states and their association and to compare the incidence of *Staphylococcus pyogenes* on the skin, determined by superficial swabbing, with that in the deeper parts of the skin. Ten students were selected at random from each of the four groups A, B, C and D and swabs were made as before. They also washed up as for an operation. After putting on dry sterile rubber gloves each student was exposed to a humid atmosphere. Sweating was induced by the immersion of the gloved hands in a hot water bath. As soon as perspiration appeared on the forehead and inside the gloves, 0.5 cc. of broth was pipetted into each glove and well massaged into the hands. The gloves were then peeled off and their inside surfaces pressed on to Fildes's agar plates, which were incubated and examined for *Staphylococcus pyogenes*. This survey revealed that some of the students remained in their original groups, while in others changes occurred. Repeated swabbing of the nose revealed a relative constancy of the nasal carrier state. The glove test distinguishes those who carry *Staphylococcus pyogenes* superficially enough for its complete removal by surgical scrubbing from those in whose skin

the infection is deep. There were fifteen superficial cutaneous carriers among the forty students tested, but of these only five were deep carriers by the glove test. Moreover, all five deep carriers were in the double carrier group. In all five the glove strains were identical with the superficial skin strains, and in four of the five the nasal strain belonged to the same serologic type. It appears, therefore, that the persistent cutaneous carrier state in a surgeon tested by Devnish and Miles was not an isolated phenomenon but one which is relatively common.

Vitamins D₂ and D₃ in Rickets.—Morris and Stevenson show that the clinical investigations so far recorded are by no means unanimous as to the relative potencies of vitamins D₂ and D₃ in the treatment of rickets in the infant. In the present study they attempt to compare the potency of crystalline vitamins D₂ and D₃. The real difficulty of the assay was to make certain that the only variable was the vitamin. The diet was a milk mixture consisting of two-thirds milk and one-third water, with sugar and oat flour in amounts suitable for the age of each patient. The infants were kept together on the same side of the ward out of direct sunlight. As far as possible, infants of the same age were used for comparison. Every patient was kept in the ward for at least three weeks before the vitamin was administered, to ensure as far as possible that the rickets had not begun to heal before specific antirachitic therapy was instituted. It was felt that any differences in the effects of vitamins D₂ and D₃ would be best detected if the dosage was on the low side. Since ordinarily a patient with rickets would almost certainly be receiving some antirachitic factor either in the diet or by natural ultraviolet irradiation, it was felt that a dose of 2,000 international units a day was on the low side for curative purposes. This amount was given to each patient, irrespective of age and weight. Accordingly the dose varied with each pair from 140 to 286 international units per kilogram of body weight daily. The authors studied the course of healing in twelve infants and children with active rickets, six of whom were given vitamin D₂ and six vitamin D₃. Serial x-ray studies were made of the wrists, and the plasma phosphatase was estimated. The results revealed no significant difference between the therapeutic effects of these two vitamins on rachitic infants and children.

New Zealand Medical Journal, Wellington

38: 301-374 (Oct.) 1939

- Infections of the Hand. A. Mason.—p. 304.
Conservative Surgery of Cancer of Rectum. D. Robb.—p. 316.
Phases in Investigation of Results of Head Injury. I. M. Allen.—p. 324.
Serologic Diagnosis of Cancer: Review of Present Position. E. F. D'Ath.—p. 334.
Some Psychologic Aspects of Deafness. W. Macdonald.—p. 341.
Nasal Sinusitis in Children. L. S. Talbot.—p. 344.

Practitioner, London

143: 357-460 (Oct.) 1939

- Advances in Medicine. A. Hall.—p. 357.
Advances in Surgery. G. E. Gask.—p. 363.
Advances in Dietetics. J. D. Cormie.—p. 368.
Advances in Treatment of Rheumatic Diseases. C. W. Buckley.—p. 376.
Advances in Treatment of Diseases of Kidney. R. Platt.—p. 384.
Advances in Anemia and Blood Diseases. L. E. H. Whitby.—p. 391.
Advances in Treatment of Diseases of Skin. J. T. Ingram.—p. 398.
Advances in Ophthalmology. H. B. Stallard.—p. 409.
Advances in Diseases of Ear, Nose and Throat. W. G. Scott-Brown.—p. 420.
Advances in Treatment of Diseases of Children. A. Moncrieff.—p. 429.
Modern Therapeutics: IV. Therapeutics of Digitalis. Rae Gilchrist.—p. 436.

Chinese Medical Journal, Peiping

56: 197-302 (Sept.) 1939

- Tuberculosis of First Infection and of Reinfection: Their Frequency in Chinese People of Peking. E. L. Opie.—p. 197.
Tuberculosis of First Infection in Adults from Rural Districts of China. E. L. Opie.—p. 216.
Peking Diets: III. During Dysentery. R. A. Guy and K. S. Yeh.—p. 225.
Relative Changes of Blood and Cerebrospinal Fluid Sugar in Schizophrenic Patients Treated with Insulin. T. H. Suh, Y. C. Chang and I. Chang.—p. 232.
Seasonal Incidence of Kala-Azar in Infants and Its Significance in Relation to Transmission Problem of the Disease. I. C. Yuan, F. T. Chu and C. U. Lee.—p. 241.
Studies on Control of Fecal-Borne Diseases in North China: VII. Epidemiology of Parasitic Amebas. G. F. Winfield and T. H. Chin.—p. 265.

Bruxelles Médical, Brussels

19: 1541-1567 (Oct. 29) 1939

- *Endocrine Gland in Wall of Renal Arterioles. N. Goormaghtigh.—p. 1541.
Malaria Therapy: Clinical and Social Results in Dementia Paralytica: C'tn. R. Bernard.—p. 1550.

Endocrine Gland in Wall of Renal Arterioles.—Goormaghtigh believes that he has traced a previously unknown endocrine gland to its site in the wall of the arterioles of the kidneys. This gland, according to the author, consists of muscle cells devoid of muscle fibrils within the media of the renal arterioles at the point where the capillary ramifications constitute a glomerular tuft and the fibrilless cells aid in forming a juxtaglomerular structure with regulating effect on glomerular circulation. In his morphologic studies on animals the author found, especially in rabbits, that a variable number of cells of the juxtaglomerular organs, clearly resembling chromophil cells of the anterior lobe of the hypophysis, contained acidophil and basophil secretory granules. In his experimental studies of the fibrilless cells in dogs and rabbits he observed that renal ischemia provoked hypertrophy and the multiplication of certain cells normally devoid of fibrils in the media of the renal arterioles, causing the transformation of muscle cells with fibrils into cells without fibrils, these cells becoming granular in rabbits and occasionally so in dogs. He also noted that, if ischemia persisted for several months, numerous fibrilless substances in the arteries of the kidneys of dogs likewise became granular and acquired endocrine characteristics. The author feels justified in concluding that, since renal ischemia stimulates almost exclusively the cells of the media of the renal arterioles, the source of the hypertensive hormone must be sought in these cells. He also thinks that hypertension secondary to nephritis, the etiology of which is still obscure, may be attributed to the stimulation of the fibrilless cells of the juxtaglomerular organs. Definite proof of this new gland awaits hormonal isolation from the media of renal arterioles, though, as the author points out, the endocrine function of the islands of Langerhans was discovered twenty-five years before the isolation of insulin.

Presse Médicale, Paris

47: 1453-1476 (Oct. 28-Nov. 1) 1939

- Immobilization in Closed Plaster Cast in Treatment of War Wounds. J. Leveuf.—p. 1453.
*Insulin Therapy in Diabetes. H. Chabanier and C. Lobo-Onell.—p. 1454.
Hypertonia of Levator Muscles of Eyelids: Physiopathologic Mechanism of Graefe's Sign. A. Kreindler.—p. 1457.

Insulin Therapy in Diabetes.—Chabanier and Lobo-Onell stress the normalization of glycemia in diabetic persons, not merely the reduction of glycosuria, as the significant thing in the management of diabetes. Fortified by seventeen years' use of a technic that employs a moderate carbohydrate regimen in conjunction with relatively large doses of insulin (800 units within fourteen hours; from 240 to 400 units within twenty-four hours), the authors challenge the therapeutic practice of carbohydrate and insulinizing the patient with small doses (10, 20, 30 units) into a state of sugar free urine, with little or no regard to hyperglycemia. Their statements are based on the superior results claimed for their method in protecting diabetic persons against postoperative sequels when surgery had to be resorted to, against infectious diseases such as anthrax and gangrene, against supervening complications, organic and neurosensory, and against the evolution of diabetes. For example, no cases of postoperative acetonemia or death occurred in 111 diabetic persons primarily treated for glycemia, whereas, in twenty-one cases treated for glycosuria, serious keto-acidosis and four deaths resulted after surgical intervention. No infectious aggravation of anthrax was noted among their own patients; furuncles observed in eleven of their patients did not proliferate, whereas, of fifteen patients under glycosuria control, eleven developed anthrax, three died in coma and three died from septicemia. Gangrenous infection, though frequently observed in their own patients, did not evolve and healed normally after incision, whereas eleven deaths occurred among twenty-seven persons treated for glycosuria, keto-acidosis, coma and septicemia. Only thirteen instances of arthritic gangrene were noted by the authors among their own patients within thirteen years, whereas numerous cases of organic and neurosensory complications were observed in persons treated primarily for glycosuria.

According to the authors, insulin not merely constitutes a substitutive medication but is capable of curative effects both in adults and in children in the sense that improvement is achieved while glycemia is maintained within normal limits on an uninterrupted carbohydrate regimen and the doses of insulin are reduced. In one case a daily dose of 200 units could be reduced to from 16 to 18 units without affecting the glycemic level. They believe that while their method is no guaranty against diabetic gangrene it confers maximal prophylaxis.

Schweizerische medizinische Wochenschrift, Basel

69: 941-964 (Oct. 21) 1939. Partial Index

Nutrition in Hospitals. H. Kapp.—p. 943.

Treatment of Hormone Deficiency Diseases. F. Grote.—p. 947.

*Examination of Thrombocytes in Unstained Dark Field Preparation. A. Fonio.—p. 952.

Importance of Technic in Heliotherapy. A. Rollier.—p. 958.

Thrombocytes in Dark Field Preparation.—According to Fonio the dark field preparation permits the visualization and the photomicrographic reproduction of the individual thrombocyte in its various evolutive phases. It reveals that the thrombocyte is a cell which consists of cytoplasm and granules, which presumably have the role of the nucleus. The granules are highly luminous formations; their number differs and their distribution in the cytoplasm is irregular particularly in the irritative forms, whereas in the quiescent forms they are centrally located, like a nucleus. The behavior of the cytoplasm varies with the evolutive form of the cell. Shortly after centrifugation the thrombocyte has a roundish or oval form with short pseudopodia, which gradually increase in length. There are several types of pseudopodia: (1) wide and rigid ones and (2) narrow and long ones with screw-like movements. The latter pseudopodia, which might be designated as "haptopodia," may become quite long and may, apparently induced by chemotactic stimuli, reach out for other thrombocytes or other particles. Some pseudopodia branch out into secondary pseudopodia. The author describes the changes in the thrombocytes before, during and after the precipitation of fibrin and what happens when several thrombocytes come together, and he analyzes the biologic significance of the cytoplasm and of the granules. He shows reproductions of a number of photomicrographs of thrombocytes.

Policlinico, Rome

46: 1895-1926 (Oct. 30) 1939. Practical Section

*Sterilization of Diphtheria Carriers. V. Lanza and E. Di Fulvio.—p. 1955.

Spastic Paraplegia of Little's Type. E. Rizzatti.—p. 1897.

Sterilization of Diphtheria Carriers.—Lanza and Di Fulvio used daily local applications of pure anatoxin on the nasal, pharyngeal, laryngeal or laryngopharyngeal mucosae of a group of eighty-four carriers harboring diphtheria bacilli. The group included convalescents and healthy carriers. In resistant cases the local treatment was given in association with hypodermic injections of increasing doses (0.5, 1, 1.5 and 2 cc.) of anatoxin. The injections were administered at intervals of five or six days up to a total number of two or four. Control of the bacilli was verified by cultural researches, which were carried on at intervals of five days. Sterilization was obtained in seventy cases in from five to thirteen days and in fourteen cases in from fourteen to twenty-five days. The treatment is simple and harmless.

Deutsche medizinische Wochenschrift, Leipzig

65: 1405-1444 (Sept. 8) 1939

Plasma Therapy of Exsiccation. G. Bessau and W. Uhse.—p. 1405.

*Lactating Ability and Its Duration. A. Reuss.—p. 1410.

Shock Treatment and Prophylaxis of Rickets. G. O. Harnapp.—p. 1414.

Metabolic Changes and Effect of Adrenal Cortex Extract and Vitamin C in Diphtheria. J. Dieckhoff.—p. 1418.

Treatment of Tuberculosis of Joints. A. Wittek.—p. 1421.

Examination of Heart and Differential Diagnosis by Means of Electrocardiogram and Kymogram. H. Reindell.—p. 1423.

Lactating Ability and Its Duration.—According to Reuss the diagnosis "deficient lactating ability" is hastily made in most cases. Women with hereditary deficiency of lactation are in the minority and a number of women producing a small amount of milk at the start of breast feeding may be brought to provide more than half or even all the child's requirement by systematic pumping, which still is the best means of rendering lactation more active. The cooperation of the patient is essential in this process. Forceps delivery, severe hemorrhages,

eclampsia and particularly puerperal fever may considerably influence lactation during the puerperal period. It is not right to speak of a deficient lactating ability in such cases, and the temporarily retarded activity of the mammary glands can be remedied as soon as the patient gets well and appropriate measures have been taken. "Initial hypogalactia," the term used by the author, is particularly frequent in mothers of prematurely born children. Laziness or weakness of the infant in sucking may sometimes convey the impression of hypogalactia of the mother. It is advisable in such cases to evacuate the mammary glands by mechanical means and feed the breast milk to the child from a bottle. The lactating ability of mothers can be maintained and only a serious disease such as mastitis can impair the activity of the mammary glands. The author recommends the creation of more ample facilities for admitting the mothers with the infants to clinics and hospitals. Mothers and students would both benefit thereby. Institution of mother's milk bureaus on a larger scale is likewise recommended.

Folia Haematologica, Leipzig

63: 1-144 (No. 1) 1939. Partial Index

Pathogenesis of Transmittable Chicken Leukemia. E. Storti and M. Brotto.—p. 1.

*Determination of Mean Red Blood Cell Diameter and Its Clinical Value. L. Schalm.—p. 34.

Experimental Investigations on Change of Blood Groups in Vitro. V. Papilian and V. Preda.—p. 85.

Cyanosis and Anemia in Chronic Acetanilid (Antifebrin) Intoxication. E. Meulengracht and E. Lundsteen.—p. 89.

Diameter of Erythrocytes.—Schalm reviews and evaluates the different methods that have been recommended for the measurement of the erythrocytic diameter. Direct measurement is accurate but time consuming. The method in which the cells are projected, drawn and measured afterward probably yields the most reliable results. The measuring of 200 cells is generally sufficient. Only in cases of considerable anisocytosis is it advisable to measure a larger number of cells. For clinical use the diffraction method is usually employed. Practice has taught that the deviations from the norm are reliably rendered by this method. Schalm also discusses the clinical value of the determination of the erythrocyte diameter. He admits that there are physiologic differences, but as a rule the normal values do not differ more than 0.4 micron. A considerable deviation of the size of the red blood cells indicates the existence of a pathologic condition, but a normal diameter does not exclude such a process. In pernicious anemia the enlarged diameter is a typical symptom, which appears early in the development of the disease. In fully developed cases the diameter is enlarged by 1 micron or more. Since the introduction of the liver treatment of pernicious anemia, considerable attention has been given to changes in the erythrocyte diameter. It was observed that the diameter decreased after this treatment. If the diameter increases during the maintenance treatment, it must be concluded that the treatment is insufficient. In sprue and similar conditions the mean diameter of the erythrocytes is often found to be distinctly enlarged. Normal diameters have been found in true cases of sprue. Moreover, the changes in the diameter are not a reliable indicator of improvement or relapse in sprue. After successful treatment the cells may remain enlarged. Changes in the mean diameter have been observed in the anemias that are thought to be due to defective formation of the antianemic principle, for instance in the anemia that is caused by dietary deficiency or in the anemia after gastrectomy. Macrocytosis has been observed also in the so-called pernicious anemia of pregnancy and in the anemias due to infestation with helminths. In the so-called secondary hypochromic anemias, the erythrocyte diameter is often smaller than normal. In hemolytic jaundice the microcytosis is usually quite pronounced, the reduction of the erythrocyte diameter amounting to about 1 micron. Although microcytosis may be of value in the diagnosis of hemolytic jaundice, its absence does not justify the rejection of this diagnosis. In neurologic disorders the determination of the erythrocyte diameter may help to decide whether such a disorder is due to pernicious anemia or not. Finally the author discusses the erythrocyte diameter in leukemia, in malaria, in renal and circulatory diseases and in endocrine disturbances. In the concluding summary he stresses, among other factors that it is wise not to attach too much value to small changes in the diameter.

Klinische Wochenschrift, Berlin

18: 1237-1268 (Sept. 16) 1939. Partial Index

- *Indications for Surgical Treatment of Pericarditis. II. H. Westermann.—p. 1237.
Position of Lactose in Nutrition of Nurlings. G. Malyoth and S. Kirimlidis.—p. 1240.
Serum Iron and Liver. G. Hemmleuer.—p. 1245.
Modification of Whooping Cough by Flying at High Altitudes. F. Pflug and Hildegard Jungheim.—p. 1247.
Demonstration of Sulfanilamides (Prontosil, Uliron, Albucid and Others). K. G. Krebs and H. Franke.—p. 1248.
Action of Prontosil Against Erysipelas. Y. Ishikawa.—p. 1251.
Counting of Thrombocytes. Vilarinho and J. Vazquez Pimentel.—p. 1253.

Surgical Treatment of Pericarditis.—According to Westermann, surgical treatment of pericarditis has increased in recent years, not because of the more frequent occurrence, especially of its callous or contracting forms, but rather because this syndrome has become better known. Two circumstances are influential in the appearance of severe functional disturbances of the heart: (1) the extension of the inflammation of the pericardium to the mediastinum with adhesions on the posterior wall of the sternum and on the ribs (accretio cordis) and (2) the shrinkage of a concentric callosity with compression of the heart and contraction at the site of entry of the large vessels (concretio pericardii). The author points out that the technic for the resection of the pericardium was developed chiefly by Schmieden, who in thirty-four cases had a total mortality of 44.1 per cent and 55.9 per cent of cures or improvements. The author thinks that 56 per cent of cures or improvements must be regarded as a considerable advance, particularly in the treatment of the callous and contracting terminal forms of pericarditis. He believes that the mortality could be reduced still further if the patients were not all in an advanced stage of the disease at the time of the operation but were subjected to treatment during the earlier stages. Since there is little prospect of further improvement in the already highly developed surgical technic, the author thinks that a betterment of the surgical results can be expected only from a better selection of the cases. At the author's clinic not every patient with pericarditis is subjected to an operation, but only those who require it and who may be expected to tolerate it. Pericarditis without a tendency to shrinkage and contraction may be cured without a surgical operation. However, in the callous and shrinking forms in which the inflow of the blood is impaired, an early operation provides the best prospects of permanent success. Such an early operation presupposes an early diagnosis, which will be possible only if physicians recognize the symptoms. The operation is contra-indicated only during the exudative stage of pericarditis, because when performed during this stage it is frequently followed by prolonged, occasionally tuberculous, fistulous suppurations. The only operation that promises success is not the precordial cardiomyolysis but rather a partial resection from the shrunken pericardium.

Medizinische Klinik, Berlin

35: 1253-1276 (Sept. 22) 1939. Partial Index

- Diagnosis, Evaluation and Treatment of Hodgkin's Disease. K. Ebhardt.—p. 1253.
*Aspects of Familial Leukemia. A. Decastello.—p. 1255.
Treatment of Pain with Dolantin, a Synthetically Produced Spasmolytic and Analgesic. H. Schlungbaum.—p. 1259.
Occupational Injuries of Heart. K. Blumberger.—p. 1260.

Familial Leukemia.—Decastello cites a number of investigators who observed and discussed familial leukemia, directing especial attention to a report by J. Weiss, to which his attention was drawn in connection with a case of leukemia that came under his observation. His patient, a woman aged 48, proved to be a member of the family in which Weiss had discovered five cases of lymphocytic anemia. After describing the clinical history of this woman the author shows a diagram of the genealogical tree of the family under consideration. This diagram indicates that, of five siblings, three, a sister and two brothers, had chronic lymphocytic leukemia, that the aforementioned sister had seven children, two of whom developed the same disorder, and that a daughter of one of the two leukemic brothers likewise developed lymphocytic leukemia. The latter patient was the woman who came under Decastello's observation, whereas the other five cases had been observed by Weiss. Decastello briefly reviews the histories of the cases presented by Weiss and says that, although only one of the six cases of familial lymphocytic leukemia was verified by necropsy, the diagnosis can

be regarded as definitely established in all except one of the cases. In this case the disorder took an aleukemic and subacute course and it is possible that the disorder in question was a lymphosarcomatosis. In only one instance did the leukemia appear during youth and in this case the course was extremely slow (fourteen years). In all others it developed when the patients were between 40 and 50 years of age and terminated in from five months to four years. The author concludes that the occurrence of these six cases of leukemia in two generations of the same family indicates that a hereditary factor may occasionally be a factor in leukemia.

Strahlentherapie, Berlin

65: 547-720 (Aug. 23) 1939. Partial Index

- Primary Biochemical Effects of Roentgen Rays. B. Bellucci.—p. 547.
Photopathology: Fundamental Principles and Most Recent Results. H. Jauson.—p. 569.
*Fractional Roentgen Therapy in Advanced Uterocervical Carcinomas Involving the Urogenital Tract. H. Kirchhoff.—p. 579.
Individual Radium Therapy in Uterocervical Carcinomas. H. Reichenmiller.—p. 595.
Demarcation of Surgical and Roentgen Ray Indications in Cancer Control. L. Schönbauer.—p. 607.
Effect of Single Roentgen Doses on Bone Marrow of White Mouse. H. Langendorff and W. Papperitz.—p. 624.

Fractional Roentgen Therapy in Advanced Uterocervical Carcinoma.—According to Kirchhoff, ureteral complications in uterocervical carcinomas are frequently observed roentgenologically and constitute the most common cause of the fatal termination of this disease through the stages of oliguria, anuria and uremia. While radium therapy shows a greater mortality debit than roentgen irradiation, the latter is, says the author, by no means so innocent of ureteral strangulation as assumed. He records the various measures proposed to destroy tumor formations and thus to relieve and release ureteral constriction and reports the successful application of simple fractional irradiation (modified Coutard method) in five of seven cases (one recidivation with bilateral hydronephrosis) of cervical carcinoma. The age level of the patients was between 31 and 68 years. Fractional therapy, employed by the author in hundreds of cases, calls for a single skin dose of 400 surface roentgens. The individual field receives from eight to ten of such applications within forty-eight hours, equivalent to a total of from 3,200 to 4,000 roentgens. Areas thus treated are the abdomen, back, sides and several perineal and vulval fields. The author regards as imperative, in cases of cervical carcinoma, the systematic examination of the urogenital tract by means of roentgen rays in addition to cystoscopic study and residual nitrogen determination. Bilateral constrictions require extreme care in roentgen ray management to prevent ureteral strangulation. In unilateral constrictions, the healthy kidney may be presumed to assume the function of the diseased. However, roentgen irradiation may evolve reflex constriction of the healthy kidney, for which ureteral catheterization is mandatory. The author thinks that in cases in which the parenchyma of the organ has been seriously impaired and hydronephrosis has existed for a long time, no reconstruction can be counted on. Fractional roentgen therapy with high dosage, involving even the possibility of sequels, is indicated whenever every other therapeutic management is contraindicated.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

106: 213-376 (Aug. 22) 1939. Partial Index

- Effect of Eck Fistula and Reversed Eck Fistula on Function of Liver and Modification of Bile Pigment: I. F. Gebhardt.—p. 213.
Purine Nitrogen and Total Nitrogen Obtained by Sternal Puncture as Measure of Cell Content of Bone Marrow: I. H. E. Bock and K. Felix.—p. 235.
Id.: II. H. E. Bock and K. Felix.—p. 243.
Determination of Porphyrin Content of Blood. O. Schumm Assisted by G. Knop.—p. 252.
*Effect of Nicotine on Potassium and Calcium Blood Content and on Potassium/Calcium Quotient. P. Scheer.—p. 314.

Effect of Nicotine on Potassium and Calcium Blood Levels.—Scheer investigates the effects of nicotine on the potassium and calcium levels in man (forty) and rabbits (ten). The forty persons chosen consisted, for the most part, of healthy men, women, younger persons, a few patients afflicted with gastritis and ventricular and duodenal ulcers and included smokers and nonsmokers. The investigation excluded persons in whom an endocrine disease was indicated. Tests on man were made by extracting venous blood before food ingestion

followed by the inhalation of two or three cigarettes of from 1 to 1.1 Gm., all of the same brand. The second blood sample was taken at the height of nicotine intoxication evidenced by sweat, nausea, vomiting, tremors and so on. Further blood samples were taken at intervals of fifteen, thirty, forty-five and sixty minutes, partly also after ninety, 120 and 180 minutes, throughout under conditions of food abstention. The author indicates the methods employed to determine potassium and calcium levels and the procedure adopted for the determination of these levels in the rabbits. He found that the average potassium level of 21.49 mg. per hundred cubic centimeters and the average calcium level of 11.8 mg. corresponded with the levels recorded in the literature. The evaluation of the results of the nicotine reaction necessitated the formation of three groups. The first group (70 per cent) showed an increase of the calcium level, varying individually between 16.8 mg. per hundred cubic centimeters and a percentage that did not exceed the average by more than 1 and 1.5. Return to normal levels occurred on an average after forty-five minutes and at the latest after sixty minutes; a few cases, however, falling below the potassium level. On the other hand, the potassium level decreased at various intervals, occasionally after forty-five minutes, and was characterized by further irregularities. The fall of the potassium/calcium quotient was indicative of a sympathicotonic reaction. In the second group (9 per cent) the potassium level showed an increase and the calcium level a decrease, a process evolving within forty-five to sixty minutes, at which time the calcium level attained its initial stage while the potassium level continued to rise in most cases, so that increased levels could be observed after from ninety to 120 minutes. The potassium/calcium quotient was indicative of a vagotonic reaction. In the third group (22 per cent) a regular increase of potassium and calcium levels, occurring within the same time as that of the other two groups, was observed. The author discovered that the cases of gastritis and ventricular and duodenal ulcers fell within this group and that the nicotine elicited increased potassium and calcium responses, considerably so in the case of potassium. The potassium/calcium quotient in this third group was enhanced. No essential differences were noted in the reactions of youths, adults, smokers and nonsmokers. Toxic phenomena differed individually or in degree. The toxic effects in the rabbits, especially after intravenous injections, consisted of tachycardia, tachypnea, salivation, occasional tonic-clonic spasms and a noticeable loss of weight at the end of the probation period. Subcutaneous injections of 1 mg. per kilogram of nicotine solution administered daily for four weeks induced an increase in the potassium and calcium levels of the serum. Increased intoxication induced by intravenous injections of from 0.5 to 1 mg. per kilogram of nicotine tartrate for six days could heighten the levels only to a small degree. It was found that three days after the injections were terminated the potassium and calcium serum levels sank and that after about three weeks the initial levels were restored.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 4713-4824 (Sept. 30) 1939. Partial Index

- Keratitis Rosacea. G. F. Rochat.—p. 4717.
 *Serious Eye Complications in Scarlet Fever: Four Cases. H. W. Scalongne.—p. 4722.
 Isometric Contraction of Muscles. J. W. Langelaan.—p. 4732.
 Arthrography of Hip Joint in Congenital Dislocation of Hip. F. R. van de Stadt.—p. 4736.
 Posttraumatic Shock and Gas Gangrene Successfully Treated with Several Great Blood Transfusions and Sulfanilamide. D. K. Wielenga.—p. 4740.
 Treatment of Scapulohumeral Arthrosis. C. van Luijt.—p. 4747.
 Intraaortic Injection of Lobeline in Asphyxia of the Newborn. B. Bosch.—p. 4750.
 Metatarsal Fracture (Military Foot). L. S. Wildervanck.—p. 4751.

Eye Complications in Scarlet Fever.—Scalongne reports that a child aged 18 months had a serious conjunctivitis from scarlet fever. The conjunctivitis did not yield to the customary treatment but was followed by keratitis, phlegmon of the upper lid and retrobulbar abscess, which lesions healed with a large residual macula cornea. After that the other eye became involved. There were conjunctivitis, phlegmon of the upper lid, panophthalmia and atrophica bulbi. Rhinitis developed and there was a discharge from the nose and both eyes. Bacteriologic examination of the conjunctival secretion revealed *Streptococcus haemolyticus*. The child died several months later during an

attack of high fever, but permission for a necropsy was refused. At first the author was not certain that the ocular complications were caused by scarlet fever, but observations in other cases made this seem probable. A second child was hospitalized with the typical symptoms of scarlatina. On the fourth day rhinitis and conjunctivitis developed. This was followed by keratitis, phlegmon of the upper lid and atrophica bulbi. On the other eye there developed, almost simultaneously, conjunctivitis and keratitis. The resulting vision permitted only reception of light. A third child with scarlatina had conjunctivitis at the time of admittance and soon keratitis and phlegmon of the upper lid developed. After this eye had almost healed, a phlegmon developed on the upper lid of the other eye, followed by eversion of the lids, necrosis of the conjunctiva and probably panophthalmia. At the postmortem examination purulent meningitis was discovered. In the fourth case purulent conjunctivitis developed followed by phlegmon of the upper lid and keratomalacia, leaving a macula on the lower half of the cornea but good vision. Simultaneously the other eye showed a phlegmon of the upper lid and keratoconjunctivitis. After healing, a small macula remained. The author thinks that the nasolacrimal duct cannot be considered the route of infection, although such cases have been reported in the literature; nor can secondary infection be clearly demonstrated as a cause. He thinks that there is a possibility that hypovitaminosis played a part in the development of the lesions. Although there were some indications of hypovitaminosis, valid proof of its causal significance could not be furnished.

Acta Medica Scandinavica, Stockholm

102: 163-274 (Oct. 17) 1939. Partial Index

- Biochemical Studies on B₁ Avitaminosis in Animals and Man. B. Carlström, K. Myrback, N. Holmin and A. Larson.—p. 175.
 *Vitamin A and Respiratory Infections. M. Uddström.—p. 214.
 Blood Syndrome in Cases of Metastatic Tumors of Bone Marrow and of Leukemia. F. S. P. van Buchem and D. J. J. M. Hendriksen.—p. 243.
 Oxygen Consumption of Various Striated Muscles in Vitro. N. Alwall.—p. 258.

Vitamin A and Respiratory Infections.—Uddström says that the significance of vitamin A for the resistance against infections and for the favorable modification of existing infections is generally accepted. However, objections have been made against the use of the term "anti-infectious vitamin." Objectors to this term have pointed out that vitamin A is only one of the many constituents of a well balanced diet which insures an adequate defense of the organism against infections. The author thinks that a diet which is so deficient in vitamin A that it results in symptoms of vitamin A deficiency is insufficient also in other respects. In this report he gives his attention to whether the subclinical or latent forms of vitamin A deficiency are likewise accompanied by an increased susceptibility to infections and whether the administration of vitamin A is advantageous in the absence of signs of vitamin A deficiency. He reports investigations on school children in a Swedish industrial region with a high percentage of unemployment. One half of the children for four months were given daily, except Sundays and holidays, 8,000 international units of vitamin A. The suggestive factor was eliminated by giving to the other children an indifferent substance of similar appearance. The medication with vitamin A exerted no influence on the growth in height or on the increase in weight; moreover, as regards infections of the respiratory passages it had no influence on the morbidity. On the basis of reports in the literature and of his own investigations the author concludes that the present knowledge about vitamin A does not justify the maintenance of the term "anti-infectious vitamin," at least if it is to designate an action that is entirely different from that of other nutritive substances. It may be regarded as definitely established that in cases in which there exists a great deficiency in vitamin A the resistance against infections of the respiratory tract is impaired. However, it cannot be asserted that slight degrees of vitamin A deficiency impair the resistance against respiratory infections. An oversupply of vitamin A is of no special advantage with regard to susceptibility for infections of the air passages. A favorable action of medication with vitamin A on the incidence, duration or severity of respiratory infections justifies the conclusion that a considerable vitamin A deficiency existed.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE

DEPARTMENT, JULY-DECEMBER 1939

Titles have been listed or Abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past six months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1930. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

- Acta chirurgica Scandinavica. Stockholm.
 Acta medica Scandinavica. Stockholm.
 Acta medica URSS. Moscow.
 Acta obstetrica et gynecologica Scandinavica. Stockholm.
 Acta orthopaedica Scandinavica. Copenhagen.
 Acta paediatrica. Stockholm.
 Acta psychiatrica et neurologica. Copenhagen.
 Acta radiologica. Stockholm.
 Acta tuberculosa Scandinavica. Copenhagen.
 American Heart Journal. St. Louis.
 American Journal of Cancer. New York.
 American Journal of Clinical Pathology. Baltimore.
 American Journal of Digestive Diseases. Huntington, Ind.
 *American Journal of Diseases of Children. A. M. A., Chicago.
 American Journal of Hygiene. Baltimore.
 American Journal of Medical Jurisprudence. Boston.
 American Journal of the Medical Sciences. Philadelphia.
 American Journal of Obstetrics and Gynecology. St. Louis.
 American Journal of Ophthalmology. St. Louis.
 American Journal of Orthopsychiatry. Menasha, Wis.
 American Journal of Pathology. Boston.
 American Journal of Physiology. Baltimore.
 American Journal of Psychiatry. New York.
 American Journal of Public Health. New York.
 American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
 American Journal of Surgery. New York.
 American Journal of Syphilis, Gonorr. and Venereal Diseases. St. Louis.
 American Journal of Tropical Medicine. Baltimore.
 American Review of Tuberculosis. New York.
 Annales de dermatologie et de syphillographie. Paris.
 Annales d'endocrinologie. Paris.
 Annales de médecine. Paris.
 Annali Italiani di chirurgia. Bologna.
 Annals of Internal Medicine. Lancaster, Pa.
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SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "SS," Student Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Am.—American	Nat.—National
As.—Association	Phys.—Physicians
Col.—College	Phar.—Pharmaceutical
Conf.—Conference	Rev.—Revision
Cong.—Congress	Ry.—Railway
Conv.—Convention	Soc.—Society
Dist.—District	Surg.—Surgery
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